NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-2 (STRENGTH OF MATERIAL)

Name Of The Faculty :- Er. Nihar Ranjan Sahoo
Branch :- Automobile Engineering **Semester :-** 3rd
Session :- 2024-25 **Examination :-** 2024 (w)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Simple Stress & Strain	10	11
2	Thin cylindrical and spherical shell under internal pressure	8	9
3	Two dimensional stress systems	10	12
4	Bending moment& shear force	10	13
5	Theory of simple bending	10	11
6	Combined direct & Bending stresses	6	6
7	Torsion	6	6
	Total Period:	60	68

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Discipline: AUTOMOBILE ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er. Nihar Ranjan Sahoo
		SESSION : 2024-25 **EXAMINATION :** 2024 (W)
Week	**Class Day**	**Topics to be Covered**
1st	1st	Introduction to Strength of Material .
	2nd	**1.0 Simple stress& strain** 1.1 Types of load, stresses & strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity.
	3rd	Poisson's ratio, derive the relation between three elastic constants,
	4th	1.2 Principle of super position, stresses in composite section
2nd	1st	1.2 Principle of super position, stresses in composite section
	2nd	1.3 Temperature stress, determine the temperature stress in composite bar (single core)
	3rd	1.3 Temperature stress, determine the temperature stress in composite bar (single core)
	4th	1.4 Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load
3rd	1st	1.4 Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load
	2nd	1.4 Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load
	3rd	1.5 Simple problems on above.
	4th	1.5 Simple problems on above.
4th	1st	**2.0 Thin cylinder and spherical shell under internal pressure** 2.1 Definition of hoop and longitudinal stress, strain
	2nd	2.1 Definition of hoop and longitudinal stress, strain
	3rd	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	4th	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
5th	1st	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	2nd	2.3 Computation of the change in length, diameter and volume
	3rd	2.3 Computation of the change in length, diameter and volume
	4th	2.4 Simple problems on above
6th	1st	2.4 Simple problems on above

Week	Class Day	Topics to be Covered
6th	2nd	**3.0 Two dimensional stress systems** 3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	3rd	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	4th	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
7th	1st	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	2nd	3.2 Location of principal plane and computation of principal stress
	3rd	3.2 Location of principal plane and computation of principal stress
	4th	3.2 Location of principal plane and computation of principal stress
8th	1st	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	2nd	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	3rd	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	4th	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
9th	1st	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	2nd	**4.0 Bending moment & shear force** 4.1 Types of beam and load
	3rd	4.2 Concepts of Shear force and bending moment
	4th	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
10th	1st	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
	2nd	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
	3rd	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam
	4th	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam
11th	1st	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam
	2nd	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load

Week	Class Day	Topics to be Covered
11th	3rd	**INTERNAL ASSESMENT**
	4th	**INTERNAL ASSESMENT**
12th	1st	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
	2nd	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
	3rd	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
	4th	4.3 Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
13th	1st	**5.0 Theory of simple bending** 5.1 Assumptions in the theory of bending,
	2nd	5.2 Bending equation, Moment of resistance, Section modulus& neutral axis.
	3rd	5.2 Bending equation, Moment of resistance, Section modulus& neutral axis.
	4th	5.2 Bending equation, Moment of resistance, Section modulus& neutral axis.
14th	1st	5.2 Bending equation, Moment of resistance, Section modulus& neutral axis.
	2nd	5.2 Bending equation, Moment of resistance, Section modulus& neutral axis.
	3rd	5.3 Solve simple problems.
	4th	5.3 Solve simple problems.
15th	1st	5.3 Solve simple problems.
	2nd	5.3 Solve simple problems.
	3rd	5.3 Solve simple problems.
	4th	**6.0 Combined direct & bending stresses** 6.1 Define column
16th	1st	6.2 Axial load, Eccentric load on column,
	2nd	6.3 Direct stresses, Bending stresses, Maximum& Minimum stresses. Numerical problems on above.
	3rd	6.3 Direct stresses, Bending stresses, Maximum& Minimum stresses. Numerical problems on above.
	4th	6.4 Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
17th	1st	6.4 Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions

Week	Class Day	Topics to be Covered
17th	2nd	**7.0 Torsion** 7.0 Assumption of pure torsion
	3rd	7.1 The torsion equation for solid and hollow circular shaft
	4th	7.1 The torsion equation for solid and hollow circular shaft
18th	1st	7.1 The torsion equation for solid and hollow circular shaft
	2nd	7.2 Comparison between solid and hollow shaft subjected to pure torsion
	3rd	7.2 Comparison between solid and hollow shaft subjected to pure torsion
	4th	Revision .

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