BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF AUTOMOBILE ENGINEERING

LESSON PLAN

SUBJECT: **STRENGTH OF MATERIAL**

FACULTY: **SUDHANSU SHEKHAR SAHOO**

ACCADEMIC SESSION: **2022-23**

SEMESTER: **3RD**

Sd/-
H O D (AutomoileEngg.)

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AUTOMOBILE ENGINEERING DEPATMENT

VISSION:

To develop competent, disciplined imaginative Automobile engineers, equipped with core competency and technical skills useful to the learning / teaching community and the industrial fraternity.

MISSION:

M1: To provide with operational and technical inputs to get innovative and research ideas in the field of automotive engineering.

M2: To give inputs for higher education with management qualities for the betterment of the society.

M3: Skilling with modern engineering tools necessary to meet and solve engineering problems.

PROGRAM EDUCATIONAL OBJECTIVES

PEO1: To provide technical skills to diagnose and apply the concept of automotive system

PEO2: To prepare to design, fabricate and innovate in automobile sector to face the industrial challenges.

PEO3: To inculcate with good communication skills, ethics and entrepreneurship skills to play the key role in automotive industry.

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Discipline:-**Automobile Engg.**	Semester :-**3rd**	Name of the teaching faculty :-
Subject Name :- **STRENGTH OF MATERIAL**	No. Of Days/Week Class Allotted :- **04 Periods/Week (Monday, Tuesday , Wednesday, Friday – 1 Period Each)**	Semester from Date -**15/09/2022** To Date **23/09/2022** **No. of Weeks:16**
1st Week	16/09/2022	Introduction to strength of material
2nd Week	19/09/2022	**1.0 Simple stress and strain** 1.1 Types of load, stresses and strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants
	20/09/2022	1.1 Types of load, stresses and strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants
	21/09/2022	1.2 Principle of super position, stresses in composite section
	23/09/2022	1.3 Temperature stress, determine the temperature stress in composite bar (single core)
3rd week	26/09/2022	1.4 Strain energy and resilience, stress due to gradually applied, suddenly applied and impact load
	27/09/2022	1.5 Simple problems on above
	28/09/2022	1.5 Simple problems on above
	30/09/2022	**2.0 Thin cylinder and spherical shell under internal pressure** 2.1 Definition of hoop and longitudinal stress, strain
	03/10/2022-10/10/2022	**DURGA PUJA HOLIDAY**
4th week	10/10/2022	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	11/10/2022	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	12/10/2022	2.3 Computation of the change in length, diameter and volume

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	14/10/2022	2.4 Simple problems on above
5th week	17/10/2022	2.4 Simple problems on above
	18/10/2022	**3.0 Two dimensional stress system** 3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	19/10/2022	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	21/10/2022	3.2 Location of principal plane and computation of principal stress
6th week	**24/10/2022**	**HOLIDAY**
	25/10/2022	3.3 Location of principal plane and computation of principal stress and maximum shear stress using Mohr's circle
	26/10/2022	**Bending moment and shear force** 4.1 Types of beam and load
	28/10/2022	4.2 Concepts of shear force and bending moment
7th week	31/10/2022	4.2 Concepts of shear force and bending moment
	01/11/2022	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
	02/11/2022	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
	04/11/2022	**CLASS TEST**
8th week	07/11/2022	DISCUSSION
	08/11/2022	**5.0 Theory of simple bending** 5.1 Assumption in the theory of bending
	09/11/2022	5.2 Bending equation, moment of resistance, section modulus and neutral axis
	11/11/2022	5.2 Bending equation, moment of resistance, section modulus and neutral axis
9th week	14/11/2022	5.3 Solve simple problem
	15/11/2022	5.3 Solve simple problem
	16/11/2022	**6.0 Combined direct and bending stresses** 6.1 Define column

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	18/11/2022	6.2 Axial load, eccentric load on column
10th week	21/11/2022	6.3 Direct stresses, bending stresses, maximum and minimum stresses Numerical problems on above
	22/11/2022	6.3 Direct stresses, bending stresses, maximum and minimum stresses Numerical problems on above
	23/11/2022	6.4 Buckling load computation using Euler's formula (no derivation) in columns with various end condition
	25/11/2022	6.4 Buckling load computation using Euler's formula (no derivation) in columns with various end condition
11th week	28/11/2022	**7.0 Torsion** 7.1 Assumption of pure torsion
	29/11/2022	7.2 The torsion equation for solid and hollow circular shaft
	30/11/2022	7.2 The torsion equation for solid and hollow circular shaft
	02/12/2022	7.3 Comparison between solid and hollow shaft subjected to pure torsion
12th week	05/12/2022	7.3 Comparison between solid and hollow shaft subjected to pure torsion
	06/12/2022	**CLASS TEST**
	07/12/2022	DISCUSSION
	09/12/2022	**REVISION**
13th week	12/12/2022	**REVISION**
	13/12/2022	**PRACTICE TEST**
	14/12/2022	DISCUSSION
	16/12/2022	DISCUSSION
14th week	19/12/2022	Problem practice
	20/12/2022	Problem practice
	21/12/2022	REVISION
	23/12/2022	REVISION