

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK  
DEPARTMENT OF MECHANICAL ENGINEERING**



**LESSON PLAN**

**SUBJECT: STRENGTH OF MATERIAL (TH 2)  
FACULTY: RUTUPARNA SAHU**

**ACCADEMIC SESSION: 2022-23  
SEMESTER: 3<sup>RD</sup>  
SEC: B**

**FACULTY SIGNATURE**

**HOD SIGNATURE**

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<b>DISCIPLINE:</b> Mechanical Engineering	<b>SEMESTER: 3<sup>rd</sup> A</b>		<b>NAME OF TEACHING FACULTY:</b> RUTUPARNA SAHU							
<b>SUBJECT: (TH-2)</b> <b>STRENGTH OF</b> <b>MATERIAL</b>	<b>No. of Days/ per week class allotted: 04</b>  <b>periods per week</b>  <b>TUE-1Period, WED-1Period, FRI-1Period, SAT-1Period</b>	<b>Semester From Date: 01/07/2024 To Date:08/11/2024</b>  <b>No. of weeks: 19 weeks</b>	<b>Theory Topics</b>							
				<b>Week</b>	<b>No of period available</b>					
				<b>1<sup>st</sup></b>	02/07/2024	1	1.1 Types of loads, stresses & strains, (Axial and tangential)			
					<b>2<sup>nd</sup></b>	03/07/2024	1	1.1 Hooke's law, young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio		
						<b>3<sup>rd</sup></b>	05/07/2024	1	1.1 Hooke's law, young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio	
				<b>1<sup>st</sup></b>	06/07/2024		1	1.1 Derive the relation between three elastic constants		
					<b>2<sup>nd</sup></b>	09/07/2024	1	1.1 Derive the relation between three elastic constants		
						<b>3<sup>rd</sup></b>	10/07/2024	1	1.2 Principle of super position	
							<b>4<sup>th</sup></b>	12/07/2024	1	1.2 stresses in composite section
								<b>5<sup>th</sup></b>	13/07/2024	1
				<b>6<sup>th</sup></b>		16/07/2024	1		1.3 determine the temperature stress in composite bar (single core)	
					<b>7<sup>th</sup></b>	19/07/2024	1	1.4 Strain energy and resilience		

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	20/07/2024	1	1.4 Stress due to gradually applied, suddenly applied and impact load 1.5 Simple problems on above
	23/07/2024	1	2.1 Definition of hoop and longitudinal stress, strain for thin cylinder
4 <sup>th</sup>	24/07/2024	1	2.2 Derivation of hoop strain, longitudinal strain and volumetric strain for thin cylinder
	26/07/2024	1	2.3 Computation of the change in length, diameter and volume for thin cylinder
	27/07/2024	1	2.4 Simple problems on thin cylinder
	30/07/2024	1	2.1 Definition of hoop and longitudinal stress, strain for spherical shell
5 <sup>th</sup>	31/07/2024	1	2.2 Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain for spherical shell
	02/08/2024	1	2.3 Computation of the change in length, diameter and volume for spherical shell
	03/08/2024	1	2.4 Simple problems on spherical shell
	06/08/2024	1	<b>Monthly Class Test</b>
6 <sup>th</sup>	07/08/2024	1	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	09/08/2024	1	3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
	10/08/2024		3.1 Determination of normal stress, shear stress and resultant stress on oblique plane
7 <sup>th</sup>	13/08/2024	1	3.2 Location of principal plane and computation of

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8 <sup>th</sup>	14/08/2024	1	principal stress
	16/08/2024	1	3.2 Location of principal plane and computation of principal stress
	17/08/2024	1	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	20/08/2024	1	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	21/08/2024	1	3.3 Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	23/08/2024	1	Numerical problems on above
	24/08/2024	1	Numerical problems on above
	27/08/2024	1	4.1 Types of beams and load
	28/08/2024	1	4.2 Concepts of Shear force and bending moment
	30/08/2024	1	4.3 Shear Force and Bending moment diagram and its salient features illustration in simply supported beam under point load
9 <sup>th</sup>	31/08/2024	1	4.3 Shear Force and Bending moment diagram and its salient features illustration in simply supported beam under uniformly distributed load

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	03/09/2024	1	4.3 Shear Force and Bending moment diagram and its salient features illustration in over hanging beam under point load
10 <sup>th</sup>	04/09/2024	1	4.3 Shear Force and Bending moment diagram and its salient features illustration in over hanging beam under uniformly distributed load
	06/09/2024	1	4.3 Shear Force and Bending moment diagram and its salient features illustration in over hanging beam under uniformly distributed load
11 <sup>th</sup>	10/09/2024	1	Numerical problems on above
	11/09/2024	1	Numerical problems on above
	13/09/2024	1	Numerical problems on above
	14/09/2024	1	Numerical problems on above
	17/09/2024	1	Numerical problems on above
12 <sup>th</sup>	18/09/2024	1	5.1 Assumptions in the theory of bending
	20/09/2024	1	5.2 Bending equation
	21/09/2024	1	5.2 Bending equation
	24/09/2024	1	5.2 Moment of resistance
	25/09/2024	1	5.2 Section modulus & neutral axis
13 <sup>th</sup>	27/09/2024	1	5.2 Section modulus & neutral axis
	28/09/2024	1	5.3 Solve simple problems
	01/10/2024	1	5.3 Solve simple problems
14 <sup>th</sup>	04/10/2024	1	6.1 Define column
	05/10/2024	1	6.2 Axial load, Eccentric load on column

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15 <sup>th</sup>	08/10/2024	1	6.3 Direct stresses, Bending stresses, Maximum & Minimum stresses
	09/10/2024	1	6.3 Direct stresses, Bending stresses, Maximum & Minimum stresses
16 <sup>th</sup>	12/10/2024	1	6.3 Numerical problems on above
	15/10/2024	1	6.3 Numerical problems on above
	18/10/2024	1	6.3 Numerical problems on above
	19/10/2024	1	6.4 Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	22/10/2024	1	6.4 Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
17 <sup>th</sup>	23/10/2024	1	7.0 Assumption of pure torsion
	25/10/2024	1	7.1 The torsion equation for solid circular shaft
	26/10/2024	1	7.1 The torsion equation for hollow circular shaft
	29/10/2024	1	7.2 Comparison between solid and hollow shaft subjected to pure torsion
18 <sup>th</sup>	30/10/2024	1	7.2 Comparison between solid and hollow shaft subjected to pure torsion
	01/11/2024	1	Numericals
	02/11/2024	1	Numericals
19 <sup>th</sup>	05/11/2024	1	<b>Revision</b>
	06/11/2024	1	<b>Revision</b>
	08/11/2024	1	<b>Previous year question discussion</b>