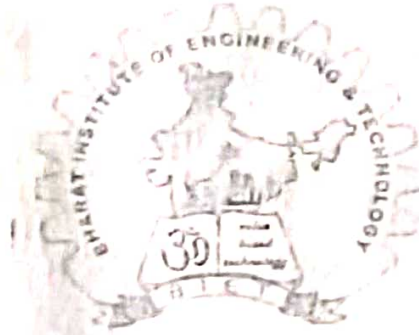


# BHARAT INSTITUTE OF ENGINEERING & TECHNOLOGY

**SIVARAM VIHAR, GHATAKESWAR HILLS  
MOHADA, BERHAMPUR (GM.)**








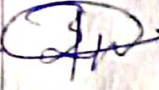

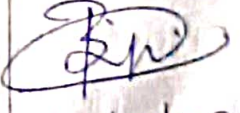
## STUDENT'S ATTENDANCE REGISTER

Time	10:45 -11:35	11:35 -12:25	12:25 -1:15		
Day					
MON		✓			
WED	✓	✓			
THU			✓		
FRI	✓				

Year/ Session	15.9.22 to 22.12.22
Semester & Branch	3 <sup>rd</sup> Sem, Civil department
Subject with Code	(Th-1) Structural Mechanics
Name of the Faculty Member	Bipina Kumar Prapathy

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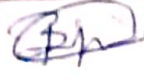








## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
<u>CHAPTER - I</u>			
REVIEW OF BASIC CONCEPTS			
- Basic principle of mechanics: Force, Moment, Support conditions, Conditions of Equilibrium.	15.09.22		
C.G & M.I, Free body Diagram	16.09.22		
- Review of C.G & M.I of different sections.	19.09.22		
	21.09.22		
<u>CHAPTER - II</u>			
SIMPLE & COMPLEX STRESS, STRAIN			
- Simple stresses & strain-			
• Introduction to stresses & strains: Mechanical properties of materials - Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue Tenacity, Durability	22.09.22		
- Type of stresses - Tensile, compressive, & shear stresses	29.09.22		
Type of strains - Tensile, compressive & shear strains Complementary shear stress - Diagonal/ tensile/Compressive stresses due to shear	29.09.22		 12/9/22



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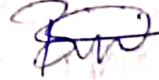



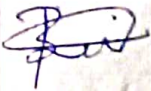
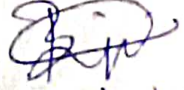
## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
Elongation & contraction, Longitudinal & Lateral strains, Poisson's Ratio, Volumetric strain, computation of stresses & strain, Poisson's Ratio, Change in dimensions & Volume etc.	26.09.22		
Hooke's Law - Elastic Constants, Derivation of relationship between the elastic constants.	28.09.22 (2)		
- Application of simple stress & strain in Engineering Field:-	29.09.22		
Behaviour of ductile & brittle materials under direct loads, stress strain curve of a ductile material			
Limit proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress, Percentage elongation, Percentage reduction in area.	30.09.22		
Significance of percentage elongation & deduction in area of cross-section,	12.10.22		
Deformation of prismatic bars due to uniaxial load, Deformation of prismatic bars due to self weight.	12.10.22		
- Complex stress & strain:-	13.10.22		
Principal stresses & strains: Occurrence of normal & tangential stresses, Concept of principal stresses & principal planes	14.10.22		
	15.10.22		



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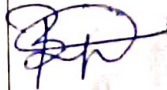


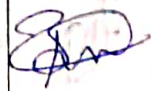

## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
<p>Major &amp; minor principal stresses &amp; their orientations, Mohr's Circle &amp; its application to solve problems of complex stresses.</p> <p style="text-align: center;"><u>CHAPTER-3</u></p> <p style="text-align: center;">STRESSES IN BEAMS &amp; SHAFTS-</p> <p>- Stresses in beams due to Bending:-</p>	17.10.22		
<p>• Bending stresses in beams- Theory of simple bending, Assumptions- Moment of resistance, Equation For Flexure, Flexural Stress distribution</p>	19.10.22		
<p>• Curvature of beam - position of N.A &amp; Centroidal Axis, Flexural rigidity, Significance of section modulus</p>	19.10.22		
<p>• Curvature of beam - position of N.A &amp; Centroidal Axis, Flexural rigidity, Significance of section modulus</p>	20.10.22		
<p>- Shear Stresses in Beams:-</p> <p>Shear stress distribution in beams of rectangular, circular &amp; standard sections symmetrical about vertical axis.</p>	21.10.22		
<p>- Stresses in Shafts due to Torsion:-</p> <p>Concept of torsion, basic assumptions of pure torsion, torsion of solid &amp; hollow circular sections, polar moment of inertia, shearing stresses, angle of twist, torsional rigidity, equation of torsion.</p>	22.10.22		
	26.10.22 (3)		 12/9/22



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## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
<ul style="list-style-type: none"> <li>- Combined bending &amp; direct stresses:-</li> <li>• Combination of stresses, combined direct &amp; bending stresses, Maximum &amp; minimum stresses in sections, conditions for no tension, Limit of eccentricity, Middle third/ fourth rule, Core or kern square, rectangular &amp; circular sections, chimneys, dams &amp; retaining walls.</li> </ul>	28.10.22		
<p style="text-align: center;"><u>CHAPTER-4</u></p> <p style="text-align: center;">COLUMNS &amp; STRUTS</p> <ul style="list-style-type: none"> <li>Columns &amp; struts. Definition, short &amp; Long Columns, End conditions, Equivalent length/ Effective length, Slenderness Ratio.</li> <li>Axially loaded short &amp; long column, Euler's theory of long columns,</li> <li>Critical load for columns with different end conditions.</li> </ul>	29.11.22		
<ul style="list-style-type: none"> <li>Columns &amp; struts. Definition, short &amp; Long Columns, End conditions, Equivalent length/ Effective length, Slenderness Ratio.</li> </ul>	31.10.22		
<ul style="list-style-type: none"> <li>Axially loaded short &amp; long column, Euler's theory of long columns,</li> </ul>	01.11.22		
<ul style="list-style-type: none"> <li>Critical load for columns with different end conditions.</li> </ul>	02.11.22		
<p style="text-align: center;"><u>CHAPTER-5</u></p> <p style="text-align: center;">SHEAR FORCE &amp; BENDING MOMENT-</p> <ul style="list-style-type: none"> <li>- Types of loads &amp; beams:-</li> <li>• Types of loads: Concentrated / Point Load</li> </ul>	04.11.22		
<ul style="list-style-type: none"> <li>Uniformly Distributed load (UDL), Types of supports. simple support, Roller support, Hinged support, Fixed support. Types of Reactions: Vertical reaction, Horizontal reactions, Moment reactions, Types of</li> </ul>	05.11.22		
	07.11.22		
	09.11.22		



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## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
Beams based on support conditions:	09.11.22		
Calculation of support reactions using equations of static equilibrium	10.11.22		
- Shear Force & Bending Moment in beams-	11.11.22		
• Shear force & Bending Moment: Signs convention for S.F. & B.M. SF & B.M of general cases of determinate beams with concentrated loads & UDL only	12.11.22		
SF & BM diagram for cantilevers	14.11.22		
Simply supported beams & Overhanging beams, Position of maximum B. Point of contra flexure, Relation between intensity of load, SF & BM	16.11.22		
<u>CHAPTER - 6</u>			
SLOPE & DEFLECTION			
- INTRODUCTION:			
Shape & nature of elastic curve	18.11.12		
Relationship between slope, deflection & Curvature	19.11.12		
Importance of slope & deflection	21.11.12		





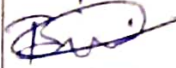
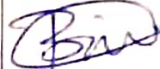





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## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
- Slope deflection of cantilever & simply supported beams under concentrated & Uniformly Distributed load (By Double Integration method, Macaulay's Method)	23.11.92	<i>[Signature]</i>	
	(2)		
	24.11.92	<i>[Signature]</i>	
	25.11.92	<i>[Signature]</i>	
	26.11.92	<i>[Signature]</i>	
	28.11.92	<i>[Signature]</i>	
	30.11.92	<i>[Signature]</i>	
<u>CHAPTER-7</u> INDETERMINATE BEAMS			
- Indeterminacy in beams • Principle of Consistent deformation/Compatibility, • Analysis of propped cantilever • Fixed & two span continuous beams by principle of superposition, • SF & BM diagraphs.	30.11.92	<i>[Signature]</i>	
	1.12.92	<i>[Signature]</i>	
	2.12.92	<i>[Signature]</i>	
	3.12.92	<i>[Signature]</i>	
	5.12.92	<i>[Signature]</i>	
	7.12.92	<i>[Signature]</i>	
	(2)		
	8.12.92	<i>[Signature]</i>	
	9.12.92	<i>[Signature]</i>	
	10.12.92	<i>[Signature]</i>	

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## SYLLABUS COVERAGE

TOPIC	DATE	SIGNATURE OF THE FACULTY	SIGNATURE OF THE H.O.D.
<u>CHAPTER - 8</u> TRUSSES			
<ul style="list-style-type: none"> <li>• Types of trusses</li> <li>• Statically determinate Trusses</li> <li>• Statically indeterminate trusses</li> <li>• Degree of indeterminacy</li> <li>• Stable &amp; Unstable trusses</li> <li>• Advantages of trusses</li> </ul>	12.12.22		
	14.12.22		
	(2)		
	15.12.22		
	16.12.22		
	17.12.22		
	19.12.22		
	21.12.22		
(2)			
	22.12.22		 12/19/22