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

LESSON PLAN

SUBJECT: AEPC203 TH-2 (STRENGTH OF MATERIALS)

Name Of The Faculty :- Er. Kanhai Gupta
Branch :- Mechanical Engineering **Semester :-** 3rd
Academic Year : 2025-26 **Examination :-** 2025 (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 Stresses & Strains , Strain Energy	10	14
2	Shear Force & Bending Moment Diagrams	9	12
3	Theory of Simple Bending and Deflection of Beams	9	10
4	Torsion in Shafts and Springs	9	13
5	Thin Cylindrical Shells	8	11
	Total Period:	45	60

K. gupta 10.07.2025
Sign of Faculty

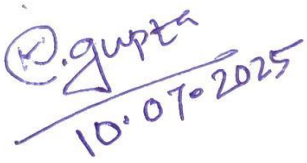
10/07/2025
Sign of H.O.D.

Name of the programme: Diploma in MECHANICAL ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er. Kanhai Gupta	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: AEPC203 TH-2	**Course Year:** Second Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	Introduction to Strength of Material .
	2nd	**I. Simple Stresses and Strains:** Types of forces; Stress, Strain and their nature;
	3rd	Stress, Strain and their nature;
	4th	Mechanical properties of common engineering materials;
2nd	1st	Significance of various points on stress – strain diagram for M.S. and C.I. specimens;
	2nd	Significance of factor of safety; Relation between elastic constants;
	3rd	Relation between elastic constants;
	4th	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces;
3rd	1st	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces;
	2nd	Thermal stresses in bodies of uniform section and composite sections;
	3rd	Related numerical problems on the above topics.
	4th	**Strain Energy:** Strain energy or resilience, proof resilience and modulus of resilience;
4th	1st	Derivation of strain energy for the following cases: i) Gradually applied load,
	2nd	ii) Suddenly applied load, iii) Impact/ shock load;
	3rd	Related numerical problems.
	4th	**II. Shear Force & Bending Moment Diagrams:** Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam; Types of Loads – Point load, UDL and UVL;
5th	1st	Definition and explanation of shear force and bending moment; Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a) Cantilever with point loads,
	2nd	b) Cantilever with uniformly distributed load,
	3rd	Related numerical problems.
	4th	c) Simply supported beam with point loads,

Week	Class Day	Topics to be Covered
6th	1st	d) Simply supported beam with UDL,
	2nd	Related numerical problems.
	3rd	e) Over hanging beam with point loads, at the center and at free ends,
	4th	f) Over hanging beam with UDL throughout,
7th	1st	Related numerical problems.
	2nd	g) Combination of point and UDL for the above;
	3rd	Related numerical problems.
	4th	**III. Theory of Simple Bending and Deflection of Beams:**Explanation of terms: Neutral layer, Neutral Axis, Modulus of Section,
8th	1st	Moment of Resistance, Bending stress, Radius of curvature; Assumptions in theory of simple bending;
	2nd	Bending Equation $M/I = \sigma/Y = E/R$ with derivation;
	3rd	Problems involving calculations of bending stress, modulus of section and moment of resistance;
	4th	Problems involving calculations of bending stress, modulus of section and moment of resistance;
9th	1st	Calculation of safe loads and safe span and dimensions of cross- section;
	2nd	Definition and explanation of deflection as applied to beams;
	3rd	Deflection formulae without proof for cantilever and simply supported beams with point load and UDL only (Standard cases only);
	4th	Deflection formulae without proof for cantilever and simply supported beams with point load and UDL only (Standard cases only);
10th	1st	Related numerical problems.
	2nd	**IV. Torsion in Shafts and Springs:** Definition and function of shaft; Calculation of polar M.I. for solid and hollow shafts;
	3rd	Definition and function of shaft; Calculation of polar M.I. for solid and hollow shafts;
	4th	Assumptions in simple torsion; Derivation of the equation $T/J=fs/R=G\theta/L$;
11th	1st	Derivation of the equation $T/J=fs/R=G\theta/L$;
	2nd	Derivation of the equation $T/J=fs/R=G\theta/L$;
	3rd	Assumptions in simple torsion; Derivation of the equation $T/J=fs/R=G\theta/L$;
	4th	Problems on design of shaft based on strength and rigidity;
12th	1st	Numerical Problems related to comparison of strength and weight of solid and hollow shafts;

Week	Class Day	Topics to be Covered
12th	2nd	Numerical Problems related to comparison of strength and weight of solid and hollow shafts;
	3rd	Classification of springs; Nomenclature of closed coil helical spring;
	4th	Deflection formula for closed coil helical spring (without derivation); stiffness of spring;
13th	1st	Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.
	2nd	Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.
	3rd	**V. Thin Cylindrical Shells:** Explanation of longitudinal and hoop stresses in the light of circumferential and longitudinal failure of shell;
	4th	Explanation of longitudinal and hoop stresses in the light of circumferential and longitudinal failure of shell;
14th	1st	Explanation of longitudinal and hoop stresses in the light of circumferential and longitudinal failure of shell;
	2nd	Derivation of expressions for the longitudinal and hoop stress for seamless and seam shells;
	3rd	Derivation of expressions for the longitudinal and hoop stress for seamless and seam shells;
	4th	Related numerical Problems for safe thickness and safe working pressure.
15th	1st	Revision & Doubt clear for Chapter-1
	2nd	Revision & Doubt clear for Chapter-2
	3rd	Revision & Doubt clear for Chapter-4
	4th	Revision & Doubt clear for Chapter-3, 5



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