



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. Nihar Ranjan Sahoo

Branch :- Automobile Engineering

Academic Year : 2025-26

Semester :- 3rd

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


10/07/2025

Sign of Faculty


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Name of the programme: Diploma in AUTOMOBILE ENGINEERING	Semester: 3rd	Name of the Teaching Faculty: Er. Nihar Ranjan Sahoo	
		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	
1 st	1 st	Introduction to Strength of Material .	
	2 nd	I. Simple Stresses and Strains: Types of forces; Stress, Strain and their nature;	
	3 rd	Stress, Strain and their nature;	
	4 th	Mechanical properties of common engineering materials;	
2 nd	1 st	Significance of various points on stress – strain diagram for M.S. and C.I. specimens;	
	2 nd	Significance of factor of safety; Relation between elastic constants;	
	3 rd	Relation between elastic constants;	
	4 th	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces;	
3 rd	1 st	Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces;	
	2 nd	Thermal stresses in bodies of uniform section and composite sections;	
	3 rd	Related numerical problems on the above topics.	
	4 th	Strain Energy: Strain energy or resilience, proof resilience and modulus of resilience;	
4 th	1 st	Derivation of strain energy for the following cases: i) Gradually applied load,	
	2 nd	ii) Suddenly applied load, iii) Impact/ shock load;	
	3 rd	Related numerical problems.	
	4 th	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;	
5 th	1 st	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,	
	2 nd	b) Cantilever with uniformly distributed load,	
	3 rd	Related numerical problems.	
	4 th	c) Simply supported beam with point loads,	

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

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

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