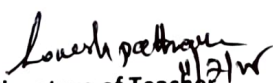


LESSON PLAN 2025-26

NAME OF THE TEACHER : LOKESH PATTHAIK, (SR. LECT, AUTOMOBILE)				
Subject: Strength of Materials (AEPC203) Program: Diploma in Automobile Engineering Semester: 3rd Total Contact Hours: 45 Total Marks: 100 Assessment: Progressive – 30, End Term – 70 Credits: 3				
COURSE OBJECTIVES: After completion of the course, the students will be able to 1. Apply the concept of Simple Stresses and Strains. 2. Describe the concept of Strain Energy. 3. Define the concept of Shear Force and Bending Moment Diagrams. 4. Apply the concept of Theory of Simple Bending and Deflection of Beams. 5. Outline the concept of Torsion in Shafts and Springs. 6. Illustrate the concept of Thin Cylindrical Shells.				
Class No.	Topic	Subtopics	Teaching Aids/Activities	Course Objective
Unit I: Simple Stress & Strain + Strain Energy (10 classes)				
1	Introduction to SOM	Applications in real life; types of loads	PPT, Examples from vehicles	CO1
2	Types of Forces	Tensile, compressive, axial, etc.	Diagrams, animation	CO1
3	Stress & Strain	Definitions, units, types	Numerical exercise	CO1
4	Stress-Strain Diagram	M.S. and C.I. curves	Chart, actual test video	CO1
5	Elastic Constants	Young's Modulus, Bulk Modulus, etc.	Formula chart, solved problems	CO1
6	Composite Sections	Stress/strain in parallel & series bars	Problem solving session	CO1
7	Thermal Stresses	Stresses due to temperature changes	Case study, formula derivation	CO1
8	Introduction to Strain Energy	Types, definitions	Visual explanation	CO2
9	Energy under Gradual/Sudden Load	Energy expressions, problems	Worksheets, derivation	CO2
10	Impact Load Problems	Numerical problems on energy types	Assignment, MCQ quiz	CO2
Unit II: S.F. & B.M. Diagrams (9 classes)				
11	Beam Types & Loads	Cantilever, Simply supported, Overhanging; Point/UDL/UVL	Beam models, drawing board	CO3
12	Introduction to S.F. and B.M.	Concepts, positive/negative forces	Whiteboard explanation	CO3
13	Cantilever with Point Loads	S.F. & B.M. diagrams	Solved examples, class work	CO3
14	Cantilever with UDL	Analytical method, calculations	Group exercise	CO3
15	Simply Supported with Point Loads	Diagram plotting, logic behind forces	Sketching board	CO3
16	SSB with UDL	Diagrams, bending effects	Numerical quiz	CO3
17	Overhanging Beam – Point Load	Reactions and moment analysis	Animated simulation	CO3
18	Overhanging Beam – UDL	Diagrams and equations	Problem sheet	CO3
19	Mixed Loads – Practice	Combined UDL & point loads	Test, individual practice	CO3
Unit III: Simple Bending & Deflection (9 classes)				

20	Theory of Simple Bending	Assumptions, neutral axis, moment of resistance	Derivation board, video explanation	CO4
21	Bending Stress	Formula, unit, bending moment	Problem solving	CO4
22	Modulus of Section & Resistance	Section properties	Charts and section view	CO4
23	Radius of Curvature	Concept and calculation	Derivation + application	CO4
24	Safe Load & Span	Deriving safe limits	Examples from engineering practice	CO4
25	Deflection of Beams - Concept	Deflection in beams (point load, UDL)	Real beam video	CO4
26	Cantilever – Deflection	Standard formulae, cases	Problem solving	CO4
27	Simply Supported Beam – Deflection	Standard formulae	Assignment	CO4
28	Summary + Practice	All bending & deflection topics	Worksheet and test	CO4
Unit IV: Torsion in Shafts & Springs (9 classes)				
29	Introduction to Shafts	Solid vs hollow shafts, applications	Videos, actual shaft demo	CO5
30	Polar Moment of Inertia	Calculation for solid & hollow shafts	Examples, formula derivation	CO5
31	Theory of Torsion	Derivation of $T/J = \theta/r$	Derivation with explanation	CO5
32	Design Based on Strength	Torque and angle of twist	Numerical problems	CO5
33	Solid vs Hollow Shaft Comparison	Weight, strength, economy	Table comparison	CO5
34	Types of Springs	Classification, uses	Physical demo	CO5
35	Closed Coil Helical Spring	Nomenclature and stiffness	Chart explanation	CO5
36	Spring Formulas & Problems	Safe load, deflection, number of coils	Numerical solving	CO5
37	Practice Session	Mixed problems on torsion and springs	Group problem sheet	CO5
Unit V: Thin Cylindrical Shells (9 classes)				
38	Introduction to Shells	Types, construction	Video of boilers/tanks	CO6
39	Longitudinal & Hoop Stress	Concept and diagrams	Sketching, animated explanation	CO6
40	Derivation – Hoop Stress	Seamless and seam shell equations	Whiteboard derivation	CO6
41	Derivation – Longitudinal Stress	Formula explanation	Worksheet and Q&A	CO6
42	Numerical – Hoop Stress	Practice problems	Calculation worksheet	CO6
43	Numerical – Longitudinal Stress	Safe working pressure, thickness	Problems with units	CO6
44	Mixed Problems & Summary	All topics on shells	Combined worksheet	CO6
45	Course Review & Model Test	Complete syllabus practice + queries	Revision test	All


Signature of Teacher


Signature of HOD