LESSON PLAN		
ORISSA SCHOOL OF MINING ENGINEERING KEONJHAR		
DEPARTMENT OF MECHANICAL ENGG		
DISCIPLINE	**SEMESTER**	**NAME OF THE FACULTY**
MECHANICAL ENGG	3RD	NIHARIKA MOHANTA
SUBJECT/CODE	NO OF PERIODS ALLOTTED IN A WEEK : **03**	SEMESTER W.E.F.: **01.07.2026**
STRENGTH OF MATERIAL/TH2		TO DATE : **5-11-2026**
		NUMBER OF WEEKS : **15**

LEARNING OUTCOMES:

After completion of the course, the students will be able to

CO 1 Apply the concept of Simple Stresses and Strains.

CO 2 Describe the concept of Strain Energy.

CO-3 Define the concept of Shear Force and Bending Moment Diagrams.

CO-4 Apply the concept of Theory of Simple Bending and Deflection of Beams.

CO-5 Outline the concept of Torsion in Shafts and Springs.

CO-6 Illustrate the concept of Thin Cylindrical Shells.

Month	Period	Date	Topics to be Covered
JULY	1	03-07-2026	Module 1:Simple stress& strain Introduction to the subject and books to be used
JULY	2	03-07-2026	Types of forces, Stress, Strain and their nature
JULY	3	04-07-2026	Strains, Elastic limit, Hooke's law, Young's modulus
JULY	4	04-07-2026	Mechanical properties of common engineering materials;
JULY	5	10-07-2026	Significance of various points on stress –strain diagram for M.S. and C.I. specimens; Significance of factor of safety
JULY	6	17-07-2026	Derivation of the relation between three elastic constant(G&E))
AUGUST	7	17-07-2026	Stress and strain values in bodies of uniform section under the influence of normal forces;
AUGUST	8	18-07-2026	Stress and strain of composite section under the influence of normal forces
AUGUST	9	18-07-2026	Thermal stresses in bodies of uniform section and composite sections;
AUGUST	10	24-07-2026	Related numerical problems on the above topics.
AUGUST	11	24-07-2026	Strain energy or resilience, proof resilience and modulus of resilience;
AUGUST	12	31-07-2026	Derivation of strain energy for the following cases: i) Gradually applied load, ii) Suddenly applied load.
AUGUST	13	31-07-2026	Derivation of strain energy for iii) Impact/ shock load; Related numerical problems
AUGUST	14	01-08-2026	**Class test 1**
AUGUST	15	01-08-2026	Module 2: **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;
AUGUST	16	07-08-2026	Definition and explanation of shear force and bending moment,Sign Convention
AUGUST	17	07-08-2026	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, b) Cantilever with uniformly distributed load
AUGUST	18	14-08-2026	SFD and BMD of c) Simply supported beam with point loads d) Simply supported beam with UDL
AUGUST	19	14-08-2026	SFD and BMD of e) Over hanging beam with point loads, at the centre and at free ends
AUGUST	20	21-08-2026	SFD and BMD of f) Over hanging beam with UDLThroughout, g) Combination of point and UDL for the above;.
SEPTEMBER	21	21-08-2026	Related numerical problems
SEPTEMBER	22	28-08-2026	CLASS TEST 2
SEPTEMBER	23	28-08-2026	Module 3 **Theory of Simple Bending and Deflection of Beams:**Explanation of terms: Neutral layer,Neutral Axis, Modulus of Section, Moment of Resistance, Bending stress, Radius of curvature;
SEPTEMBER	24	29-08-2026	Assumptions in theory of simple bending; Bending Equation $M/I = \sigma/Y = E/R$ with derivation

SEPTEMBER	25	29-08-2026	Problems involving calculations of bending stress, modulus of section andmoment of resistance;
SEPTEMBER	26	05-09-2026	Calculation of safe loads and safe span and dimensions of crosssection;
SEPTEMBER	27	05-09-2026	Definition and explanation of deflection as applied to beams
SEPTEMBER	28	11-09-2026	Deflection formulae without proof for cantilever and simply supported beams with point load and UDL only(Standard cases only)
SEPTEMBER	29	11-09-2026	NUMERICALS
SEPTEMBER	30	18-09-2026	**Module 4.Torsion in Shafts and Springs Introduction**
OCTOBER	31	18-09-2026	Definition and function of shaft; Calculation of polar M.I.for solid and hollow shafts
OCTOBER	32	19-09-2026	Assumptions in simple torsion Derivation of the equation T/J=fs/R=Gθ/L;
OCTOBER	33	19-09-2026	Problems on design of shaft based on strength and rigidity
OCTOBER	34	25-09-2026	Numerical Problems related to comparison of strength and weight of solid and hollow shafts;
OCTOBER	35	25-09-2026	Classification of springs; Nomenclature of closed coil helical spring;
OCTOBER	36	03-10-2026	Deflection formula for closed coil helical spring (without derivation); stiffness of spring
OCTOBER	37	03-10-2026	Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.
OCTOBER	38	09-10-2026	**Module 5: Thin Cylindrical Shells:Introduction thin cylinder, thick cylinder** Explanation of longitudinal and hoop stresses in the.circumferential and longitudinal failure of shell
OCTOBER	39	09-10-2026	Derivation of expressions for the longitudinal and hoop stress for seamless and seam shells;
OCTOBER	40	16-10-2026	Safe thickness and safe working pressure
OCTOBER	41	16-10-2026	numericals
OCTOBER	42	30-10-2026	INTERNAL ASSESMENT
OCTOBER	43	30-10-2026	INTERNAL ASSESMENT
OCTOBER	44	31-10-2026	INTERNAL ASSESMENT
NOVEMBER	45	31-10-2026	INTERNAL ASSESMENT

25/06/2026