Lesson Plan

Subject : **Mechanics of Solids-II (MEC-206A)**

Lesson plan Duration : 15 Weeks

Work load (lecture) per week : Lectures/Tutorial: 3/1 hours/Week

Lecture No	Description
1	Introduction to subject
2	**UNIT I**: **Strain Energy & Impact Loading**: Definitions, expressions for strain energy stored in a body when load is applied (i) gradually, (ii) suddenly and (iii) with impact.
3	Strain energy of beams in bending, beam deflections.
4	Strain energy of shafts in twisting, energy methods in determining spring deflection.
5	Castigliano's theorem, Numerical.
6	Theories of Elastic Failures: Various theories of elastic failures with derivations and graphical representations
7	Applications to problems of 2- dimensional stress system with (i) Combined direct loading and bending.
8	(ii) Combined torsional and direct loading.
9	Numerical problems
10	Numerical problems
11	**UNIT II: Thin Walled Vessels:** Hoop & Longitudinal stresses in cylindrical &spherical vessels and their derivations under internal pressure.
12	Numerical problems on Hoop & Longitudinal stresses.
13	Strains in cylindrical &spherical vessels and their derivations under internal pressure.
14	Numerical problems on strains in cylindrical &spherical vessels.
15	Wire would cylinders.
16	Numerical problems
17	**Thick Cylinders & Spheres:** Derivation of Lame's equations.
18	Radial & hoop stresses and strains in thick.

19	Compound cylinders and spherical shells subjected to internal fluid pressure only, hub shrunk on solid shaft.
20	Numericals.
21	**UNIT III: Rotating Rims & Discs:** Stresses in uniform rotating rings & discs, rotating discs of uniform strength.
22	Stresses in (I) rotating rims, neglecting the effect of spokes.
23	(ii) Rotating cylinders, hollow cylinders & solids cylinders.
24	Numerical problems
25	**Springs:** Stresses in closed coiled helical springs.
26	Stresses in open coiled helical springs subjected to axial loads.
27	Stresses in open coiled helical springs subjected to twisting couples.
28	Leaf springs
29	Flat spiral springs, concentric springs.
30	Numerical problems
31	**Unit IV: Bending of Curved Bars :** Stresses in bars of initial large radius of curvature, bars of initial small radius of curvature.
32	Stresses in crane hooks, rings of circular & trapezoidal sections.
33	Deflection of curved bars & rings.
34	Deflection of rings by Castigliano's theorem
35	Stresses in simple chain links, deflection of simple chain links.
36	Problems.
37	**Unsymmetrical Bending:** Introduction to unsymmetrical bending.
38	Stresses due to unsymmetrical bending, deflection of beam due to unsymmetrical bending.
39.	Shear center for angle, channel, and I-sections.
40.	Numerical problems