SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

SreeSainath Nagar, A. Rangampet-517 102

Name of the Department

Lesson Plan cum Diary 2015-'16

Name of the Subject : Mechanics of Solids **Name of the faculty member :**
Class & Semester :II Year, I **Section :**

S. No.	Topic	No. of periods	Dates Covered	No. of Periods used	Book(s) followed	Topics for self study
UNIT I- SIMPLE STRESSES AND STRAINS						
1.	Elasticity and plasticity – Types of stresses and strains – Hooke's law – Stress–strain diagram for mild steel – Working stress – Factor of safety	2			T1	1.Types of Loads and Forces
2.	Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them	1			T1	
3.	Tutorial-01	1				
4.	Bars of varying section – Composite bars	3			T1	
5.	Tutorial-02	1				
6.	Temperature stresses – Strain energy – Resilience – Gradual and suddenloadings – Simple applications.	2			T1	
7.	Formative test- Impact loading and applications.	1			T1	
8.	Tutorial-03	1				
Total Periods Required:		**12**				
UNIT II SHEAR FORCE AND BENDING MOMENT						1. Practical applications of SF and BM diagrams
9.	Types of beams, supports and loads – Concept of shear force and bending moment	2			T1	
10.	SF and BM diagrams for cantilever beams	1			T1	
11.	Tutorial-04	1				

12.	SF and BM diagrams for simply supported beams	2			T1	
13.	SF and BM diagrams for overhanging beams	1			T1	
14.	Tutorial-05	1			T1	
15.	Relation between SF, BM and rate of loading at a section of beam.	3			T1	
16.	Tutorial-06	1			T1	
17.	Point of contra–flexure	1			T1	
Total Periods Required:		13				
UNIT III- STRESSES IN BEAMS						
18.	Theory of simple bending – Basic bending equation– Neutral axis – Bending stresses Section modulus of rectangular, circular section, I, T, Angle and Channel sections	2			T1	1. Effect of bending stress and shear stress on beams of various c/s.
19.	Tutorial-07	1				
20.	Design of simple beam sections – Strain energy due to bending, Shear stress distribution: Rectangular, circular, triangular, I, T, Angle sections	3			T1	
21.	Tutorial-08	1				
22.	Strain energy due to shear.	1			T1	
23.	Stresses under combined action of direct loading and bending moment, Core of a section. Stresses in chimneys, retaining walls and dams, conditions for stability	2			T1	
24.	Tutorial-09	1				
25.	Stresses due to direct loading	1			T1	
26.	Formative test- Bending moment about both axes	1			T1	
Total Periods Required:		**13**				

UNIT IV TORSION AND SPRINGS						
27.	Theory of pure torsion	1			T1	1. Areas where torsion is applied and applications of springs.
28.	Tutorial-10	1				
29.	Polar section modulus – Power transmitted by shafts	2			T1	
30.	Combined bending, torsion and end thrust –	1			T1	
31.	Tutorial-11	1				
32.	Design of shafts. Deflection of close and open coiled helical springs	3			T1	
33.	Tutorial-12	1				
34.	Springs in series	1			T1	
35.	Formative test- Springs in parallel	1			T1	
Total Periods Required:		**12**				
UNIT V THIN CYLINDERS and THICK CYLINDERS						
36.	Thin cylindrical shells – Longitudinal and circumferential stresses	1			T1	1. Applications of thin and thick cylinders.
37.	Tutorial-13	1				
38.	Hoop, longitudinal and volumetric strains	1			T1	
39.	Lame's theory	1			T1	
40.	Distribution of hoop and radial stresses across thickness	1			T1	
41.	Tutorial-14	1				
42.	Design of thick cylinders – Compound cylinders	2			T1	
43.	Difference of radii for shrinkage.	1			T1	
44.	Tutorial-15	1				
Total periods required:		**10**				
Grand total periods required:		**60**				

Number of Classes : 45
Number of Tutorials : 15

TEXT BOOKS

1. Punmia, B. C., Ashok Kumar Jain and Arun Kumar Jain, *Mechanics of Materials*, 1st Edition, Laxmi Publications Pvt. Ltd., 2001.
2. Basavarajaiah, B.S. and Mahadevappa. P, *Strength of Materials*, 3rd Edition, Universities Press (India) Pvt. Ltd., 2010.

REFERENCE BOOKS

1. Rajput, R.K., *Strength of Materials (Mechanics of Solids)*, 5th Edition, S. Chand & company Ltd., 2006.
2. Junnarkar, S. B. and Shah, H. J., *Mechanics of Structures– Vol. I* (Strength of Materials), 27th Revised and Enlarged Edition, Charotar Publishing House Pvt. Ltd., 2008.
3. Bhavikatti, S. S., *Strength of Materials*, 3rd Edition, Vikas Publishing House, 2010.
4. Khurmi, R. S., *Strength of Materials,* 23rd Edition, S. Chand & Company Ltd., 2005.

Signature of the faculty Member **Signature of the Chairman (BOS)**