**Usha Rama College of Engineering and Technology**

**Department of Civil Engineering**

**LESSON PLAN**

**Sub**: **Strength of Materials-1 Year: II [A] Semester: I V.SRINIVASARAO**

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| **U N I T  I** | **Session No.** | **Topics to be covered** | **No. of Periods** | **DATE** |
| 1.1 | Introduction ,Types of stresses & strains, Elasticity & plasticity | 1 | 13/6/16 |
| 1.2 | Hooke's law and problems | 1 | 14/6/16 |
| 1.3 | stress strain curve for mild steel | 1 | 15/6/16 |
| 1.4 | problems on stress strain relations | 1 | 16/6/16 |
| 1.5 | Poisson's ratio | 1 | 18/6/16 |
| 1.6 | volumetric strain for cylindrical rod, rectangular bar. | 1 | 20/6/16 |
| 1.7 | Elastic moduli and relation between them, problems | 1 | 22/6/16 |
| 1.8 | Analysis of bars of varying cross-section and composite bars | 1 | 23/6/16 |
| 1.9 | Temperature stresses and problems | 1 | 24/6/16 |
| 1.10 | Introduction, Derivation of strain energy due to gradual load & sudden load | 2 | 27/6/16 |
| 1.11 | Impact load, problems on strain energy | 1 | 28/6/16 |
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| **U N I T  II** | **Session No.** | **Topics to be covered** | **No. of Periods** | DATE |
| 2.1 | Introduction to topics | 1 | 29/06/16 |
| 2.2 | Definition of beam and types of beams | 1 | 1/7/16 |
| 2.3 | Concept of SF and BM | 1 | 2/7/16 |
| 2.4 | SF & BM for cantilever beam subjected to concentrated load at free end | 1 | 4/7/16 |
| 2.5 | SF and BM for cantilever beam subjected to U.D.L over entire span | 1 | 5/7/16 |
| 2.6 | SF and BM for cantilever beam subjected to U.V.L entire span | 1 | 8/7/16 |
| 2.7 | SF and BM for S.S.B subjected to concentrated load at centre and eccentric load | 1 | 11/7/16 |
| 2.8 | SF and BM for simply supported beam subjected to U.D.Lover entire span | 1 | 12/7/16 |
| 2.9 | SF and BM for simply supported beam subjected to U.V.L over entire span | 1 | 13/7/16 |
| 2.10 | Point of contraflexure definition and cantilever beam, S.S.B subjected to combination of loads | 1 | 15/7/16 |
| 2.11 | Over hanging beam subjected to loads, Relation b/w SF, BM and rate of loading | 2 | 18/7/16 |
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| **U N I T  III** | **Session No.** | **Topics to be covered** | **No. of Periods** | **DATE** |
| 3.1 | Definition of simple bending and assumptions. | 1 | 18/7/16 |
| 3.2 | Derivation of simple bending equation | 1 | 20/7/16 |
| 3.3 | Definition of neutral axis, bending stress and section modulus, section modulus formulas for rectangular, hollow circular sections | 1 | 22/7/16 |
| 3.4 | Problems on rectangular beam with different unknowns (f,b,d,R,W,l) | 1 | 25/7/16 |
| 3.5 | Problems on circular beam with different unknowns (f,d, R,W, l) | 1 | 26/7/16 |
| 3.6 | Problems on hollow rectangular beam with different unknowns (B,b,f,D,d,W,l) | 1 | 28/7/16 |
| 3.7 | Problems on hollow circular beam with different unknowns (D,d,f,W,l) | 1 | 29/7/16 |
| 3.8 | Problems on I-section beams | 1 | 1/8/16 |
| 3.9 | Problems on T-sections | 1 | 2/8/16 |
| 3.10 | Problems on channel sections | 2 | 3/8/16 |
| 3.11 | RIVISION &TEST | 2 | 4/8/16  6/8/16 |
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| **U N I T  IV** | **Session No.** | **Topics to be covered** | **No. of Periods** | **DATE** |
| 4.1 | Introduction o shear stress and derivation of shear stress | 1 | 16/8/16 |
| 4.2 | Shear stress distribution for rectangular beam | 1 | 17/8/16 |
| 4.3 | Shear stress distribution for circular beam | 1 | 19/8/16 |
| 4.4 | Shear stress distribution for triangular section | 1 | 22/8/16 |
| 4.5 | Shear stress distribution for symmetrical I-section | 1 | 23/8/16 |
| 4.6 | Shear stress distribution for unsymmetrical I-section | 1 | 24/8/16 |
| 4.7 | Shear stress distribution for T-section | 1 | 26/8/16 |
| 4.8 | Shear stress distribution for angle sections | 1 | 29/8/16 |
| 4.9 | Shear stress distribution for builtup beams & TEST | 2 | 30/8/16 |
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| **U N I T  V** | **Session No.** | **Topics to be covered** | **No. of Periods** | **DATE** |
| 5.1 | Introduction to topics | 1 | 1/9/16 |
| 5.2 | Derivation of relation between curvature, slope, deflection equation | 1 | 2/9/16 |
| 5.3 | Introduction to double integration and Macaulay's method | 1 | 6/9/16 |
| 5.4 | Derivation of slope and deflection for cantilever beam and problems on it by macaulay's method | 2 | 7/9/16 |
| 5.5 | Derivation of slope and deflection for cantilever beam subjected to U.V.L over entire span by using Macaulay's method | 2 | 9/9/16 12/9/16 |
| 5.6 | Derivation of slope and deflection for S.S.B by using Macaulay's method | 2 | 14/9/16 15/9/16 |
| 5.7 | Derivation of slope and deflection for S.S.B subjected to U.V.L over entire span and problems on it by using Macaulay's method | 2 | 16/9/16 17/9/10 |
| 5.8 | Introduction to moment area method (or) Mohr's Theorems | 1 | 19/9/16 |
| 5.9 | Derivation of slope and deflection for cantilever beamwith different loading by using Mohr's Theorems | 2 | 20/9/16 21/9/16 |
| 5.10 | Derivation of slope and deflection for simply supported beam with different loading by using Mohr's theorems & TEST | 2 | 22/9/16 22/9/16 |
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| **U N I T  VI** | **Session No.** | **Topics to be covered** | **No. of Periods** | **DATE** |
| 6.1 | Introduction to topics, thin cylinders | 1 | 26/9/16 |
| 6.2 | Derivation of longitudinal and circumferential stresses | 1 | 27/9/16 |
| 6.3 | Derivation of hoop, longitudinal, circumferential strains | 2 | 28/9/16 |
| 6.4 | Problems on stresses and strains | 2 | 30/9/16 |
| 6.5 | Thin spherical shells | 2 | 3/10/16 |
| 6.6 | Introduction to topics, thick cylinders | 1 | 4/10/16 |
| 6.7 | Derivation of lame's Theorem | 2 | 5/10/16 |
| 6.8 | Distribution of hoop and radial stresses across thickness | 1 | 6/10/16 |
| 6.9 | Design of thick and compound cylinders | 1 | 8/10/16 |
| 6.10 | Thick spherical shells | 1 |  |

TEXT BOOKS :

Strength of materials by S.S Bhavakatti

REFERENCES:

1.Strength of materials by S.S Rattan , Tata MCGraw Hill education pvt, Ltd.,

2. Strength of materials by R.K Rajput , S. Chand & co, New Delhi.