CONTACT PERIODS: 3 (LECTURE) PER WEEK

DURATION OF EXAM : 3 HRS

PROGRESSIVE MARKS : 50

EXAM MARKS : 100

OBJECTIVE:

To give an introduction to the basic principles governing structural systems.

OUTLINE:

 1. Simple Stresses and Strains – Concept of Deformable Bodies, Types of stresses (compressive, tensile, bending, shear) and strain (axial, shear, volumetric). Simple problems. Modulus of Elasticity, Typical stress-strain behaviour of steel and concrete.

2. Elastic Constants- Elastic constants, Rigidity Modulus, Poisson's Ratio, Bulk Modulus and Shear Modulus. Relations-Modulus of Elasticity and Modulus of Rigidity. Application to uniform sections

3. Bending Moment and Shear Force Diagrams – Concept of Shear force and Bending Moment. BMD and SFD for statically determinate beams subjected to combinations of concentrated and uniform loadings, uniformly varying load. Relationship among Load, Shear force and Bending Moment.

4. Bending and Shear Stresses for Beams – Theory of Bending with assumptions. Flexture formula. Bending stress distribution for simple sections (symmetrical about vertical axis). Strength of a section. Equation for shear stress distribution across a section. Shear stress distribution for simple sections.

References:

1 "Strength of Materials – RK Bansal, Laxmi Publications, New Delhi, Third Edition

2 “Applied Mechanics and Strength of Materials” – IB Prasad