

# AMBE05 MECHANICS OF STRUCTURES-I

## UNIT-1 FORCES AND STRUCTURAL SYSTEMS

- 1.1 Types of force systems
- 1.2 Resultant of forces
- 1.3 Lami's theorem
- 1.4 Principle of moment's varignon's theorem
- 1.5 Principle of equilibrium (no reaction problems)
- 1.6 Simple problems

## UNIT-2 ANALYSIS OF PLANE TRUSSES

- 2.1 Introduction to Determinate and Indeterminate plane trusses
- 2.2 Analysis of simply supported and cantilevered trusses by method of joints.

## UNIT-3 PROPERTIES OF SECTION

- 3.1 Centroid
- 3.2 Moment of Inertia
- 3.3 Section modules
- 3.4 Radius of gyration
- 3.5 Theorem of perpendicular axis
- 3.6 Theorem of parallel axis
- 3.7 Simple problems.

## UNIT-4 ELASTIC PROPERTIES OF SOLIDS

- 4.1 Stress strain diagram for mild steel,
- 4.2 High tensile steel and concrete
- 4.3 Concept of axial and volumetric stresses and strains. (excluding composite bar)

## UNIT-5 ELASTIC CONSTANTS

- 5.1 Elastic constants
- 5.2 Relation between elastic constants
- 5.3 Application to problems.

### References Books:

1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Nash W.A., "Strength of Materials" – Schaums Series, McGraw Hill Book Company, 1989.
4. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.