AMAG06 STRENGTH OF MATERIALS AND DESIGN OF STRUCTURES

UNIT-1 ELASTICITY
1.1 Stresses and strains-Elastic limit
1.2 Elastic constants-Lateral strain
1.3 Composite sections-Temperature stresses-Volumetric strain in a body
1.4 Resilience and strain energy.

UNIT-2 ANALYSIS OF STATICALLY DETERMINATE BEAMS
2.1 Shear force and bending moment diagrams,
2.2 Bending and shearing stresses in beams
2.3 Slope and deflection of beams using double integration method,
2.4 Macaulay's method, Moment area theorems and conjugate beam method.

UNIT-3 COMBINED BENDING AND DIRECT STRESSES
3.1 Columns and struts - Euler's theory- Empirical formulae for loads on columns; Stresses in thin cylindrical shells
3.2 Torsion of shafts and springs; Analysis of statically indeterminate beams, Propped beams, fixed and continuous beams
3.3 Analysis using superposition, three moment equation and moment distribution methods.

UNIT-4 ANALYSIS AND DESIGN OF SINGLY REINFORCED AND DOUBLY REINFORCED BEAMS
4.1 Shear, bond and torsion- Design of T beams- Slabs- Design of one way and two way slab (IS code method only)
4.2 Columns, Foundations, Retaining walls, Silos and Ferro cement tanks.

UNIT-5 LOADS AND USE OF BIS CODES
5.1 Design of riveted and welded connections
5.2 Design of structural steel members in tension, compression and bending.

Reference Books:
1. Ramamrutham, S. and Narayan, R. (1995). Design of Steel Structures. Dhanpat Rai and Sons, Delhi.
2. Ramamrutham. S. (1984). Engineering Mechanics and strength of Materials. Dhanpat Rai and Sons, Nai Sarak, New Delhi.
3. Ramamrutham. S. and Narayan. R. (1997). Strength of Materials. Dhanpat Rai and Sons, Nai Sarak, New Delhi.