

AMBE14 STRUCTURAL ANALYSIS

UNIT-1 SHEAR FORCES AND BENDING MOMENT

- 1.1 Beam, Types of Loads, Types of Supports, Shear Force and Bending Moment, Sign Convention, Shear Force and Bending Moment Diagrams,
- 1.2 S.F. and B. M. Diagrams for Simply Supported Beams, S. F. and B.M. Diagrams for Overhanging Beams, Relationship between Rate of Loading,
- 1.3 Shear Force and Bending Moment, Graphical Method of Plotting S. F. and B. M. Diagrams, Uniformly Distributed Loads

UNIT-2 DEFLECTION OF BEAMS

- 2.4 Relationship between Curvature, Slope and Deflection, deflection Curves, Macaulay's Method, Deflection Curve by Macaulay's Method,
- 2.5 Propped Cantilevers, Deflections by Moment Area Method, Sign Convention, Slope and Deflection for Cantilever, Slope and Deflection for simply Supported Beam,
- 2.6 Deflections by Conjugate Beam Method, Deflection by strain Energy, Impact Loading on Beams, Laminated Spring, Deflection Due to Shear

UNIT-3 FIXED AND CONTINUOUS BEAMS

- 3.7 Fixing Moments for a Fixed Beam of Uniform Section, Effect of Sinking of Support, Effect of Rotation of a Support, Slope and Deflection at a point, by Moment Area Method,
- 3.8 Introduction, Analysis of Continuous Beams, Reactions at the supports, Effect of Sinking of Supports

UNIT-4 COLUMNS AND STRUTS

- 4.1 Euler Crippling Load-Column with One End Free and the Other End Fixed, Column with both ends fixed, Column with One End Fixed and the other Hinged,
- 4.2 Limitation of Euler's Formula, Column with Initial Curvature, Column Carrying Eccentric Load, Laterally Loaded Columns, Empirical Formulae

UNIT-5 RIVETED CONNECTIONS

- 5.1 Riveted Connections, Types of Riveted Joints, Failure of Riveted Joints, Strength of Riveted Joints, Permissible Stresses in Rivets,
- 5.2 Design of Riveted Joints, Riveted Joints in Cylindrical and Spherical Shells, Structural Connections, Riveted Joints Subjected to Moment Acting in the Plane of the Joint, .
- 5.3 Riveted Joint Subjected to Moment Acting at Right Angles to the Plane of the Joint.

UNIT-6 WELDED CONNECTIONS

- 6.1 The welding process, types of welds, intermittent fillet welds, combined stresses in weld, eccentric welded connection

Reference books:

1. Recent Advances in Matrix Methods of Structural Analysis and Design by J Tinsley Oden