AMBE09 MECHANICS OF STRUCTURES-II

UNIT-1 SHEAR FORCE AND BENDING MOMENT

1.1 Basic concepts- shear force and bending moment diagrams for cantilever and simply supported beams subjected to various types of loadings (Point loads, uniformly distributed loads)

1.2 Over hanging simply supported beams

1.3 Point of contra flexure

UNIT-2 STRESSES IN BEAMS

2.1 Theory of simple bending

2.2 Bending stress distribution

2.3 Strength of sections

2.4 Beams of composite sections (Flitched beams)

2.5 Shearing stress distribution in beam sections

UNIT-3 DEFLECTION OF BEAMS

3.1 Slope and deflection at a point

3.2 Double Integration method and Macaulay's method for simply supported and cantilever beams

UNIT-4 COLUMNS

4.1 Short and long columns

4.2 Concept of Elastic stability

4.3 Euler's theory

4.4 Assumptions and Load carrying capacity of Columns with different end conditions

4.5 Concept of Effective length

4.6 Slenderness ratio

4.7 Limitations of Euler's theory

4.8 Rankine's formula.

UNIT-5 STATICALLY INDETERMINATE BEAMS

5.1 Introduction

5.2 Determination of degree of statically indeterminacy for beams and frames

5.3 Concept of Analysis (No Problems)

References Books:

1. M.M. Ratwani & V.N. Vazirani, "Analysis of Structures", Vol. 1, Khanna Publishers, Delhi, 2012.
2. Timoshenko, S.P. and D.H. Young, "Elements of Strength of Materials", Fifth edition, East West Press, 1993.
3. A.R. Jain and B.K.Jain, "Theory and analysis of structures", Vol. 1, Nemchand and Bros, Roorkee, 1987.