

CE/BOS/CE C204/0210

K L UNIVERSITY
STRENGTH OF MATERIALS (CE C 204)

SYLLABUS

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3	1	0	4

UNIT – 1 Shear Force and Bending Moment:

Introduction; Diagrammatic conventions for supports; Diagrammatic conventions for loading; Classification of beams; Concept of shear force and bending moment; relationship between load, shear force and bending moment, Shear force and bending moment diagrams for statically determinate beams and frames.

UNIT – 2 Pure Bending and Shearing Stresses of Beams:

Introduction; Some important limitations of the theory; Basic assumptions; The flexure formula; Computation of the moment of inertia; Remarks on the flexure formula.

Introduction; Shear flow; The shearing stress formula for beams; Shear stress distribution for various sections; Shear centre.

UNIT – 3 Analysis of Plane Stress:

Introduction; Equations for the transformation of plane stress; Principal Stresses; Principal planes; Maximum shearing stresses; Mohr's circle of stress; Construction of Mohr's circle of stress.

UNIT – 4 Torsion:

Introduction, torsional deformations of a circular bar, circular bar of elastic materials, stresses and strain in pure shear, relationship between E and G, thin walled tubes. circumferential and longitudinal stresses.

UNIT – 5 Columns:

Introduction; Stability of equilibrium; The Euler's formula for columns with different end restraints; Limitations of the Euler's formulas; Generalized Euler buckling - load formulas; The Secant formula; Rankine's empirical formula.

Text books:

1. Mechanics of materials by J.M. Gere, Thomsombrooks/Cole India edition, Sixth edition,2006.
2. Mechanics of Materials by F. Beer, E. Johnston and J. DeWolf, McGraw- Hill Publishers, Third Edition,2006.

Reference Books:

5. Strength of Materials Part I & II by S P Timoshenko. CBS Publishers and distributors, New Delhi, 3rd Edition.
6. Mechanics of Materials by Riley, Strurges and Morris, John Wiley and Sons Inc. fifth Edition.
7. Strength of Materials by A Pytel and F. L. Singer. Harpers Collins Publishers India.