

For Syllabus, Question Papers, Notes & many More

CE6452 SOLID MECHANICS

DETAILED SYLLABUS

UNIT I INTRODUCTION

Definition of stress, strain and their relations – relations between material constants – axial loading - statically determinate and indeterminate problems in tension & compression – plane truss analysis – method of joints – method of sections – 3-D trusses – thermal stresses – impact loading.

UNIT II STRESSES IN BEAMS

Shear force & bending moment diagrams: bending and shear stress variation in beams of symmetric sections, a typical spar section: beams of uniform strength - beams of two materials.

UNIT III DEFLECTION OF BEAMS

Double integration method – macaulay's method – moment area method – conjugate beam method – principle of superposition – maxwell's reciprocal theorem.

UNIT IV TORSION – SPRINGS – COLUMNS

Torsion of solid and hollow circular shafts – shear stress variation – open and closed-coiled helical springs – stresses in helical springs – classification of columns – euler buckling – columns with different end conditions.

UNIT V BIAXIAL STRESSES

Stresses in thin-walled pressure vessels – combined loading of circular shaft with bending, torsion and axial loadings – Mohr's circle and its construction – determination of principal stresses.

TEXT BOOKS

1. William Nash, "Strength of Materials", Tata McGraw Hill, 2004.
2. Timoshenko and Young "Strength of Materials" Vol. I & II.

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REFERENCES

1. Dym,C.L., and Shames,I.H., 'Solid Mechanics', McGraw Hill, Kogakusha, Tokyo, 1973.
2. Stephen Timoshenko, 'Strength of Materials', Vol I & II, CBS Publishers and Distributors, Third Edition.
3. Timoshenko,S. and Young, D.H., 'Elements of Strength of Materials', T.Van Nostrand Co. Inc., Princeton, N.J., 1977.

OBJECTIVES

To introduce various behavior of structural components under various loading conditions.