

(Textile Engineering Department)

Undergraduate

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**Course Title: Strength of Materials 1**

**Prerequisite:** Static

**Number of Credits:** 3

**Lecturer:** Dr. Hadi Dabiryan

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**Course Topics:**

- Acquaintance with basic concept in mechanic of materials; Shear force and bending moment diagram

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- Concept of Stress; Introduction; Stresses in the Members of a Structure

- Concept of Stress; Shearing stress; bearing stress

- Strain; Stress-Strain relationship

- Strain; Hooke's Law; Modulus of Elasticity

- Strain; Deformations of Members under Axial Loading; Poisson's ratio

- Torsion; Introduction; Deformations in a Circular Shaft

- Torsion; Angle of twist in elastic range

- Torsion; Torsion of Noncircular Members; Thin-Walled Hollow Shafts

- Pure Bending; Introduction; Deformations in a Symmetric Member in Pure Bending

- Pure Bending; Stress Concentrations; Plastic Deformations

- Shearing Stresses in Beams; Introduction; Shear on the Horizontal Face of a Beam Element

- Shearing Stresses in Beams; Further Discussion of the Distribution of Stresses in a Narrow Rectangular Beam; Shear center

- Transformations of Stress and Strain; Introduction; Transformation of Plane Stress; Principal Stresses

- Transformations of Stress and Strain; Maximum Shearing Stress; Mohr's Circle for Plane Stress

- Analysis of the thin-walled pressure vessel

- Compound Stresses; Superposition and its limitation; unsymmetrical bending;

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**Reading Resources:**

- Mechanic of Materials, E. Popov, Translated By: S. Tahooni, 2nd Edition,