

CVE 202: Strength of Materials (2 Units)

Direct stress: Hooke's experiment. Axially loaded bar, tensile and compressive stresses. Strain; tensile and compressive strains. Stress-strain curves for ductile and brittle materials. Modulus of elasticity. Mechanical properties of materials; elastic limits, proportional limit, yield points, ultimate strength. Modulus of toughness. Percentage reduction in areas. Percentage elongation. Principal stress: Definition, deductions from Mohr's circle. Mohr's circle method of determining stress and strain. Working stress, proof stress, poisson's ratio, modulus of rigidity. Factors of safety. Lateral stresses and strains. Bars of varying cross sections compound bars under stress and strains. Temperature stresses. Tension: effects of torsion. Twisting moment. Polar second moments of area. Torsional shearing stresses and strain. Modulus of elasticity in shear. Angle of twist. Rupture. Shearing force and bending moments. Simply supported beam. Loading forces and moments in beams. Shear and moment equations. Shear forces and bending moment diagrams.