Strength of Materials II

Course code: 28263
Credits: 2
Course type: Theoretical
Prerequisites: Strength of Materials I
Course length: 34 hours

Outlines:

1- **A Review on Strength of Materials I**

2- **Bending analysis of curved beams**

3- **Failure criteria**

Maximum shear stress criterion (Tresca), maximum distortion energy criterion (von Mises), maximum axial stress criterion, Mohr-Coulomb criterion

4- **Energy methods**

Concept of elastic energy and external work, determination of elastic energy in different loading types, the virtual work principle, Maxwell's reciprocal theorem, strain energy and complementary strain energy, the unit-load method, Castigliano's theorems and their application in analysis of statically determinate and indeterminate structures (trusses, beams, frames), applications in impact loading

5- **Stability of columns**

Stability concept for structures in equilibrium, stability of columns, the Euler critical load for columns in different boundary conditions, analysis of columns under eccentric loads, the Secant formula, design of columns using theoretical and empirical relations

References:

1. Engineering Mechanics of Solids (2nd Ed.), E.P. Popov, 1998
2. Mechanics of Materials (3rd Ed.) F.P. Beer, E.R. Johnston & J.T. Dewolf, 2002