

Course Syllabus

Academic year: 2018-2019

Institution	University of Petroșani
Faculty	Mechanical and Electrical Engineering
Field of study	Industrial engineering
Level	Bachelor
Program of study	Machine Building Technology

Course	Strength of Materials I
Code	2BB3OD22
Year of study (semester)	II (III)
Number of hours	70
Number of credits	5
Professor	Lecturer eng,Ph.D. RADU Daniel

No.	Topic
1.	Introduction, definitions, classification, representation and fundamental hypothesis used in Strength of Materials
2.	The Stress Tensor: Equilibrium Conditions, Stress in the inclined facets, Principal Stresses and Principal Directions, Two-Dimensional Analysis of the Stress Tensor, Mohr's Circle
3.	The Strain Tensor: Components of the Strain Tensor, Pure deformation and Rigid Body Motion, equation of Compatibility, Deformation in an Arbitrary Direction, Two-Dimensional Analysis of the Strain Tensor
4.	Axially loaded members: Generalized Hooke's Law, Deformation Energy, The Superposition Theory, Yielding and Rupture Laws
5.	Bending Moment: Pure Plane Bending, Normal Stress calculation, Tangential Stress Calculation, The Core of a Cross- Section, Movement and deformation produced by various bending loads

6.	Shear Force: The Longitudinal Shear Force, Shearing Stress determination in various Cross-Sections
7.	Bending Deflections: deflection caused by bending movements, Method of the Integration of the Curvature Equation, The Conjugate Beam Method, Equation of Three Moments
8.	Torsion: Torsion in the Elastic Regime, Stress calculus in the circular and rectangular cross-sections, Open thin-walled cross-section, Optimal shape for cross-sections under Torsion
9.	Energy Theorems: Maxwell and Castigliano theorems, Veresceaghin corollary to Maxwell Theorem, Betti's Theorem, Principle of the Stationary of the Potential Energy