Course Title	**Solid Mechanics**				
Course Code	**MME 256**				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	2nd year / 3rd semester				
Teacher's Name	Vasileios Vavourakis				
ECTS	5	Lectures / week	3 hours	Laboratories / week	8 hours total
Course Purpose and Objectives	The aim of this course is to teach the students the fundamental principles of the mechanics of solids. This will permit the students evaluate and calculate stresses and strains in basic solid mechanics problems and in simple-geometry structural analysis problems.				
Learning Outcomes	• Understand the basic concepts and principles of the mechanics of solids. • Calculate stresses and strains in solid deformable bodies / structures subject to external loadings – under quasi-static conditions: ♦ uniaxial loading (tension, compression), ♦ shear due to torsion, ♦ pure bending and transverse loading, ♦ combination of the above loading conditions. • Build their ability to critically think and apply their theoretical knowledge in solid mechanics on relevant mechanical engineering problems. • Identify, formulate and solve design problems in mechanical engineering.				
Prerequisites	MME 125	Required	None		
Course Content	The material being taught in this course covers the introduction and theoretical description of the fundamental notions in solid mechanics (stress and strain measures, stiffness, etc.), generalized theory of elasticity (Hooke's law), Mohr's circle (in 2D and in 3D), uniaxial stress analysis (tension, compression), uniform loading of plates, (elastic and elastoplastic) shaft torsion, (elastic and elastoplastic) beam bending and eccentric beam loading. The course also contains laboratory sessions that are supported by hands-on lab work and experiments of the following tests: tensile test (of ductile and brittle metals), compression test, three-point bending test, hardness test (Rockwell, Vickers). **Laboratory Exercises** • Tensile test (of ductile and brittle metals) • Bending test (Three-point, Cantilever) • Compression test • Torsion test (axisymmetric, non-axisymmetric)				

Teaching Methodology	• Class lectures (whiteboard, PowerPoint) • Course-supporting lectures • Laboratory lectures – experimental mechanics of solids • Communicative, Collaborative • During the first week of the semester, the course syllabus is given to students, which includes information on the course content, expected learning outcomes, assessment and office hours.
Bibliography	• Beer, F.P., E.R. Johnston, J.T. DeWolf and D.F. Mazunek, *Mechanics of Materials*. McGraw-Hill. • Morrow, H.W. and R.P. Kokernak, *Statics and strength of materials*. Prentice Hall. • Malvern, L.E., *Introduction to the Mechanics of a Continuous Medium*. Pearson ISBN-10: 0134876032. • Timoshenko, S.P. and J.N. Goodier, *Theory of Elasticity*. McGraw-Hill.
Assessment	• Midterm exams (x2) 46% • Final exam 44% • Laboratory 10%
Language	Greek