

Course Title	Continuum Mechanics				
Course Code	MMK 531				
Course Type	COMPULSORY				
Level	MASTER/PHD				
Year / Semester	WINTER SEMESTER				
Teacher's Name	STYLIANOPOULOS TRIANTAFYLLOS				
ECTS	8	Lectures / week	2 X 1,5 HOURS	Laboratories / week	NO
Course Purpose and Objectives	The purpose of the course is the teaching of the mechanical behavior of fluids and solids under the same generalized framework, the familiarization with the methods and measures of stress and strain calculation, the familiarization with basic problems of fluid and solid mechanics and the teaching of the methodologies for solution of continuum mechanics problems.				
Learning Outcomes	<p>The students at the end of the course will be able to</p> <ul style="list-style-type: none"> • analyze the kinematics of the motion of material elements that obey to the laws of continuum mechanics, • calculate stresses and strains, • apply the conservation of mass, momentum and energy, • select the proper constitutive equations, • solve problems of fluid and solid mechanics 				
Prerequisites	NO	Required	NO		
Course Content	The course include a brief review of the symbols and calculations among tensors and vectors and focuses on the study of (1) the kinematics of a continuum, and specifically to the calculation of stress and strain tensors and rates of deformation tensors, (2) the balance laws: conservation of mass, momentum and energy, (3) the constitutive equations for the mechanical behavior of solids, fluids and viscoelastic materials, (4) constitutive theories for ideal fluids, Newtonian fluids and linear elastic solids, (5) analytical solution of fluid and solid mechanics problems.				
Teaching Methodology	<p>Lectures 3 hours per week / Tutorials 1 hour per week</p> <p>Teaching is supported by academic lectures and homework exercises. The instructor does not exclusively use a single book and the lectures are based on the notes and the bibliography given below. All course material (lecture notes, exercises, etc.) are uploaded on the web site of the course in Blackboard. During the semester, additional auxiliary / reading material is posted to BlackBoard if this is necessary.</p> <p>There is continuous communication with the instructor and active participation of the students in the class.</p> <p>During the first week of the semester the instructor hands in the Syllabus of the course to the students, which includes all information about the materials</p>				

	covered by the course, the learning outcomes, the evaluation and the office hours.
Bibliography	<ul style="list-style-type: none"> - P. Chadwick, <i>Continuum Mechanics</i>, Dover Publications - L. E. Malvern, <i>Introduction to the Mechanics of a Continuous Media</i>, Prentice-Hall - M. E. Gurtin, <i>An introduction to Continuum Mechanics</i>, Academic Press - Y. C. Fung, <i>A First Course in Continuum Mechanics</i>, Prentice-Hall
Assessment	Homework assignments (10%), midterm exam (30%), final exam (60%)
Language	GREEK OR ENGLISH