Course Title	**Nanomechanics**				
Course Code	**MME 564**				
Course Type	**Elective**				
Level	Graduate				
Year / Semester	Spring semester				
Teacher's Name	Andreas Kyprianou				
ECTS	8	Lectures / week	2 X 1,5 hours	Laboratories / week	NO
Course Purpose and Objectives	The course aims to introduce to students those notions of mechanics, both classical and quantum that are important in understanding the operation of micro and nano-devices.				
Learning Outcomes	Students should be able to 1) understand when solids can be described as continuum and when as quantum mechanical objects 2) recognize the key dynamics in play as the size scale of a system is reduced 3) apply this knowledge in analyzing existing micro-nano-devices 4) apply this knowledge in designing new micro-nano-devices 5) understand the principle of operation of different equipment used to probe events at nano-scale 6) carry out literature survey on a topic of interest in Nanomechanics				
Prerequisites	NO	Required	NO		
Course Content	The operating environment of nanostructures is completely different of that of their macroscale counterparts. For example, responses to thermal fluctuations, and for certain scales to quantum potentials, contribute to their positional uncertainty. The basic classical, statistical and quantum mechanics and thermodynamics required to characterize nano-mechanical devices will be introduced. In addition the principle of operation of various devices used to probe the properties of a nano-system will be explained. An overview of continuum mechanics notions such as stress and strains, elastic contacts and waves in solids will be given.				
Teaching Methodology	Lectures; Written report and Presentations by students of individual projects on topics of materials and technologies related to the course Communicative, Collaborative				

	During the first week of the semester, the Syllabus of the course is given by the teacher, which includes information on the course content, expected learning outcomes, assessment and office hours
Bibliography	• Andrew Cleland, *Foundations of Nano-mechanics*, 2003, ISBN: 3-540-43661-8 • Flexible reading tailored to each student's background.
Assessment	Homework 5% Midterm exam 25% Literature survey on a Special Topic (Analysis of at least six relevant research articles): 30% Final Exam: 40%
Language	English