

Course Title	Advanced Engineering Thermodynamics				
Course Code	MMK 512				
Course Type	COMPULSORY				
Level	MASTER/PHD				
Year / Semester	SPRING SEMESTER				
Teacher's Name	STAVROS KASINOS				
ECTS	8	Lectures / week	2 X 1,5 AN HOUR	Laboratories / week	NO
Course Purpose and Objectives	The purpose of the course is the teaching of the basic principles of thermodynamics and training of the students to the solution of problems found in industry.				
Learning Outcomes	<p>The students will be able to</p> <ul style="list-style-type: none"> • perform thermodynamic analysis for the optimization of complex engineering systems, • design thermodynamic systems with the use of software and computers, • prepare professional design analysis reports, • understand the behavior and properties of non-reacting mixtures with emphasis on mixtures of ideal gases, • perform psychrometric analysis of air-conditioning systems, • understand the concepts of subsonic, sonic, supersonic and hypersonic flow and analyze simple compressible flow systems and • compute the change in thermodynamic properties across normal shock waves. 				
Prerequisites	NO	Required	NO		
Course Content	The course content involves thermodynamic analysis of engineering systems, emphasizing systematic methodology for application of basic principles and the utilization of modern computational tools and optimization software. Introduction to availability analysis. Thermodynamics of ideal gas mixtures including air and water-vapour mixtures. Thermodynamics of condensed phases, including solutions. Introduction to thermodynamics of compressible flow. Specialized topics depending on the composition of the audience (e.g. thermodynamics of biological systems). The course also involves a series of laboratory exercises.				
Teaching Methodology	<p>Lectures 3 hours per week / Tutorials or lab exercise 1 hour per week</p> <p>Lectures. The teaching methodology is based on the “deductive reasoning” method, which means that the theory and the applications of it are presented first in a general form and subsequently they are specialized for the particular problems.</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 covered by the course, the learning outcomes, the evaluation and the office hours.</p>
Bibliography	<p>Lecture notes</p> <p>W. C. Reynolds and P. Colonna Thermodynamics: fundamentals and engineering applications Cambridge University Press, 2018.</p>
Assessment	<p>Team design work 60%, written exam 30%, short assignments 10%</p>
Language	<p>GREEK OR ENGLISH</p>