Course Title	**Modern Computational Tools For Engineers**				
Course Code	**MME419**				
Course Type	**Technical Elective Course**				
Level	Undergraduate				
Year / Semester	4th year /				
Teacher's Name	Stavros Kassinos				
ECTS	6	**Lectures / week**	3+1	**Laboratories / week**	
Course Purpose and Objectives					
Learning Outcomes	1. Appreciation of the advantages offered by the object oriented programming paradigm during the design and development of scientific code. 2. Fluency in the programming tools offered by Fortran 2008/2015 for the design of parallel scientific programs. 3. Fluency in the numerical modeling and simulation of simple engineering systems.				
Prerequisites	**MME117, MME317**	Required			
Course Content	Computational engineering refers to the process of translating the description of physical systems into models that can be analyzed using computers. The use of computational tools for analysis is part of the everyday routine of engineers. When properly used computational tools are a powerful ally that every engineer should be able to rely on. This course offers an introduction to *Object Oriented Scientific Programming* (OOSP) as a paradigm for the design and development of effective scientific programs. Emphasis is placed on the tremendous capabilities unleashed in Fortran 2008/2015, which allows parallel programs to be developed and executed on personal computers with minimal overhead. The process of modeling of physical systems and the subsequent program design and development are treated as a unified process. Programming skills are developed through a series of examples from various branches of Mechanical Engineering, such as fluid dynamics, energy storage conversion and transfer, and biomedical engineering				
Teaching Methodology	Lectures, in-class coding examples, tutorials, code writing labs				
	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					
Assessment	Final exam and continuous assessment. Continuous assessment includes midterm exams and class participation.				
Language	Greek				