a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM004Y03	*Semester*	4
Course title	**Fluid mechanics I**		

Independent teaching activities	*Weekly teaching hours*	*ECTS*
Lectures	4	6.5
Laboratory exercises	1	

Course type	Special background
Course category	Compulsory
Prerequisite courses	-
Language of instruction and examinations	Greek
Is the course offered to Erasmus students	Yes
Course website (url)	https://eclass.uniwa.gr/courses/MECH107/ https://eclass.uniwa.gr/courses/MECH119/ (Erasmus students)

b) Learning outcomes and general competences

b1. Learning outcomes

Upon successful completion of this course, the student will be able to:

- Describes the fundamental principles governing the statics and dynamics of fluids,
- Solves hydrostatic and aerostatic problems,
- Identifies the fundamental equations for conservation of mass, momentum and energy in integral form and explain the physical significance of their individual terms,
- Implements the fundamental equations of mass, momentum and energy conservation for the analysis of problems of one-dimensional - incompressible flows in closed conduits,
- Applies analytical methods for calculating flow quantities in practical applications,
- Uses the methodologies of dimensional analysis and the similarity rules for the design of experiments and the evaluation of measurements,
- Implements the required procedures for conducting laboratory activities and submit a technical report on them.

b2. General competences

- Search for analysis and synthesis of data and information with the use of the necessary technology
- Working independently
- Team work

c) Syllabus

Introductory concepts, Fluid statics, Kinematics of fluid flow, Integral analysis of flow fields, Turbulent flows, Dimensional analysis and similitude, One dimensional incompressible flows in closed conduits, Laboratory and computational exercises.

d) Teaching and learning methods - Evaluation

Delivery	Face-to-face, Distance learning
Use of information and communications technology	- Commercial/free/open source software - Multimedia applications - MS Teams and eclass

	- Open courses	
Teaching methods	*Activity*	*Semester workload*
	Lectures	39
	Tutorials	10
	Laboratory exercises	13
	Computational exercises	3
	Individual work	104
	Course total	169
Student performance evaluation	Intermediate assessment (individual and / or group work and / or written examination) and written final examination. For the laboratory exercises: Individual and / or group assignments and written or oral examination or presentation, per exercise and per case of study.	

e) Suggested bibliography

1. Παπαϊωάννου, Α. (2002). *Μηχανική των Ρευστών*. Εκδ. Γ. Γκέλμπεσης.
2. Παπανίκας, Δ.Γ. (2010). *Εφαρμοσμένη Ρευστομηχανική*. Media Guru.
3. Cengel, Y. and Cimbala, J. (2013). *Fluid Mechanics: Fundamentals and Applications*. McGraw Hill.
4. Elger F.D., Williams C.B., Crowe T.C. and Roberson A.J. (2018). *Μηχανική Ρευστών για Μηχανικούς*. Α. Τζιόλα & Υιοί Α.Ε.
5. Munson B.R., Rothmayer A.P., Okiishi T.H. and Huebsch W.W. (2016). *Μηχανική Ρευστών*. Α. Τζιόλα & Υιοί Α.Ε.