a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM107Y02	*Semester*	7
Course title	**Fluid mechanics II**		

Independent teaching activities	*Weekly teaching hours*	*ECTS*
Lectures	4	5.5
Laboratory exercises	1	

Course type	Knowledge deepening/consolidation
Course category	Compulsory for Direction 1
Prerequisite courses	-
Language of instruction and examinations	Greek
Is the course offered to Erasmus students	Yes
Course website (url)	https://eclass.uniwa.gr/courses/MECH109/ https://eclass.uniwa.gr/courses/MECH120/ (Erasmus students)

b) Learning outcomes and general competences

b1. Learning outcomes

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

- Identifies the fundamental equations of conservation of mass, momentum and energy in differential form and explains the physical significance of their individual terms,
- Calculates the aerodynamic forces exerted on bodies,
- Calculates the coefficient of friction and the integral sizes of the boundary layer on surfaces that interact with the flow field,
- Implements the mass, momentum and energy conservation equations to analyze one-dimensional compressible flow problems,
- Solves unsteady flow problems,
- Implements the required procedures for conducting laboratory activities and submit a technical report on them,
- Collaborate with his classmates to analyze and present a study that may include a computational and / or experimental part using computational and experimental fluid dynamics tools, combining information and communication technologies.

b2. General competences

- Search for, analysis and synthesis of data and information with the use of the necessary technology
- Working independently
- Team work
- Working in an international environment

c) Syllabus

Differential analysis of fluid flow, Incompressible-inviscid flows, Boundary layers, One-dimensional compressible flows, Unsteady flows, Experimental and computational fluid dynamics. Laboratory and computational exercises.

d) Teaching and learning methods - Evaluation

<table>
<tr><td>Delivery</td><td colspan="2">Face-to-face, Distance learning.</td></tr>
<tr><td>Use of information and communications technology</td><td colspan="2">- Commercial/free/open source software
- Multimedia applications
- MS Teams/Moodle/eclass
- Open courses</td></tr>
<tr><td rowspan="7">Teaching methods</td><td>Activity</td><td>Semester workload</td></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Tutorials</td><td>10</td></tr>
<tr><td>Laboratory exercises</td><td>10</td></tr>
<tr><td>Computational exercises</td><td>5</td></tr>
<tr><td>Individual work</td><td>92</td></tr>
<tr><td>Course total</td><td>156</td></tr>
<tr><td>Student performance evaluation</td><td colspan="2">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.</td></tr>
</table>

e) Suggested bibliography

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