

## 1.1.1 Fluid Mechanics

### GENERAL

<b>SCHOOL</b>	Engineering		
<b>ACADEMIC UNIT</b>	CIVIL ENGINEERING		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	YΔP002	<b>SEMESTER</b>	4th
<b>COURSE TITLE</b>	Fluid Mechanics		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
	4	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Scientific Field		
<b>PREREQUISITE COURSES:</b>			
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>			

### LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> <li>• Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</li> <li>• Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</li> <li>• Guidelines for writing Learning Outcomes</li> </ul>		
<p>Upon completing this course students should be able to recognize the basic rules governing fluid mechanics, hydrostatics, fluid flow and energy equations.</p>		
<p><b>General Competences</b></p> <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>  <i>Adapting to new situations</i>  <i>Decision-making</i>  <i>Working independently</i>  <i>Team work</i>  <i>Working in an international environment</i>  <i>Working in an interdisciplinary environment</i>  <i>Production of new research ideas</i> </td> <td style="width: 50%; border: none;"> <i>Project planning and management</i>  <i>Respect for difference and multiculturalism</i>  <i>Respect for the natural environment</i>  <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>  <i>Criticism and self-criticism</i>  <i>Production of free, creative and inductive thinking</i>            .....  <i>Others...</i>            .....         </td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> ..... <i>Others...</i> .....
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The course contributes to the following skills:  
 \_ Search for, analysis and synthesis of data and information  
 \_ Decision-making  
 \_ Working independently  
 \_ Respect for the natural environment  
 \_ Production of free, creative and inductive thinking.

## SYLLABUS

- Basic properties of fluids.
- Hydrostatics.
- Flow dynamics..
- Navier-Stokes equations.

## TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;"><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	Face to face.	
<p style="text-align: center;"><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Learning process support (teaching and communication with students) through PowerPoint lectures, through the online course website, through the electronic e-learning platform and through additional electronic communication with students (online announcements and comments, emails, etc.). Additional material (lecture presentations, educational videos, useful sites, and scientific articles) posted on the e-learning platform. Teacher-student collaboration time either in person or via teleconference.	
<p style="text-align: center;"><b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	32
	Practice/exercises	10
	Practice/exercises	10
	Project(s)	10
	Individual study	68
Course total (26 hours workload per ECTS credit)	<b>130</b>	
<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Language of Evaluation: Greek.</p> <p>Written test with extended answer questions (formative and/or inferential).</p> <p>Theory assessment (90% of the final grade):</p> <ul style="list-style-type: none"> <li>• A written progress examination (30% of the final grade) including:           <ul style="list-style-type: none"> <li>_ Theoretical Extended Response Questions (formative and/or inferential)</li> <li>_ Problem-solving exercises.</li> </ul> </li> <li>• Written final examination (60% of the final grade) including:           <ul style="list-style-type: none"> <li>_ Theoretical extended response questions (formative and/or inferential)</li> </ul> </li> </ul>	

	<p>_Problem-solving exercises.  Laboratory assessment (10% of the final grade):</p> <ul style="list-style-type: none"> <li>• Written assignment on laboratory exercises.</li> </ul> <p>The present course description with the assessment criteria is accessible to students in the Departmental study guide (Departmental website) and on the course website.  The outline is communicated orally to students during the first lecture.</p>
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#### ATTACHED BIBLIOGRAPHY

- [in Greek] Πρίνος Παναγιώτης, Μηχανική ρευστών, Εκδόσεις Ζήτη, 2014, ISBN: 978-960-456-419-4, Κωδικός Βιβλίου στον Εύδοξο: 41963463
- [in Greek] Λιακόπουλος Αντώνης, Μηχανική Ρευστών, Εκδόσεις Τζιόλα, 2019 (2η έκδοση), ISBN: 978-960-418-774-4, Κωδικός Βιβλίου στον Εύδοξο: 77107657
- [in Greek] Τσακογιάννης Ιωάννης, Μηχανική των ρευστών, Εκδόσεις Επίκεντρο, 2005, ISBN: 978-960-6645-09-9, Κωδικός Βιβλίου στον Εύδοξο: 15023
- [in Greek] Αυλωνίτης Δημήτρης, Αυλωνίτης Σταμάτης, ΜΗΧΑΝΙΚΗ ΡΕΥΣΤΩΝ Ι, Εκδόσεις Τσότρας, 2020 (5η έκδοση), ISBN: 978-618-5309-95-4, Κωδικός Βιβλίου στον Εύδοξο: 94645124
- [in Greek] Παπαϊωάννου Άγγελος, Μηχανική των Ρευστών, Εκδόσεις Σοφία, 2019 (3η έκδοση), ISBN: 978-960-633-004-9, Κωδικός Βιβλίου στον Εύδοξο: 86055189