

1.1.1 Water Resources and Flood Risk Management

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΥΔΡ009	SEMESTER	8th
COURSE TITLE	Water Resources and Flood Risk Management		
INDEPENDENT TEACHING ACTIVITIES <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>	WEEKLY TEACHING HOURS	CREDITS	
	4	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialization Course		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

LEARNING OUTCOMES

<p>Learning outcomes <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><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 				
<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Gain a deep understanding of the fundamental concepts of water resources management. • Comprehend and infer the natural processes of flood phenomena and methods for quantifying their characteristics. • Calculate the hydrological design of water resources utilization projects. • Analyze and solve a multi-purpose hydro-system management problem. • Formulate and solve optimization problems of water distribution systems using classical and evolutionary algorithms. • Evaluate, assess, and manage flood risk. 				
<p>General Competences <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></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>		<i>Respect for difference and multiculturalism</i>
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	<i>Respect for difference and multiculturalism</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>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>
The course contributes to the following skills: _ Search for, analysis and synthesis of data and information _ Adapting to new situations _ Decision-making _ Working independently _ Working in an interdisciplinary environment _ Project planning and management _ Respect for the natural environment _ Production of free, creative and inductive thinking.	

SYLLABUS

<p>Course Description:</p> <p>The course aims to provide students with the necessary theoretical background for the course 'ΥΔΡ009 Water Resources and Flood Risk Management'. It includes the essential material for understanding: (a) the principles of water resources management within the framework of sustainable development, (b) computational methods and analysis tools that support the design and optimal operation of hydro-systems under uncertainty, and (c) computational and analytical techniques and methodologies for the estimation and management of flood risk.</p>

TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p><i>Face-to-face, Distance learning, etc.</i></p>	Face to face.																				
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p><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;">TEACHING METHODS</p> <p><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>	<table border="1"> <thead> <tr> <th style="text-align: center;"><i>Activity</i></th> <th style="text-align: center;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">36</td> </tr> <tr> <td>Practice/exercises</td> <td style="text-align: center;">16</td> </tr> <tr> <td>Project(s)</td> <td style="text-align: center;">10</td> </tr> <tr> <td>Educational visit</td> <td></td> </tr> <tr> <td>Individual study</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Course total (26 hours workload per ECTS credit)</td> <td style="text-align: center;">130</td> </tr> </tbody> </table>	<i>Activity</i>	<i>Semester workload</i>	Lectures	36	Practice/exercises	16	Project(s)	10	Educational visit		Individual study								Course total (26 hours workload per ECTS credit)	130
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p>	Evaluation Language: Greek Written Examination with Extended Response Questions (Formative and/or Conclusive)																				

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Theory Assessment (80% of the final grade):

- Written progress exam (20% of the final grade) which includes:

- o Extended Response Theoretical Questions (Formative and/or Inferential)

- o Solving problems-exercises

- Final written exam (60% of the final grade) which includes:

- o Extended Response Theoretical Questions (Formative and/or Inferential)

- o Solving problems-exercises

Individual assignment (20% of the final grade)

This course description text with the evaluation criteria is accessible to students in the Department's study guide (Department website) and on the course's website.

The outline is communicated orally to the students during the first lecture.

ATTACHED BIBLIOGRAPHY

- [In Greek] Κουτσογιάννης Δημήτριος, Ξανθόπουλος Θεμιστοκλής, Τεχνική Υδρολογία, Εκδόσεις Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος", ISBN: 978-960-603-506-7. Κωδικός Βιβλίου στον Εύδοξο: 59390290
- [In Greek] Μπαλτάς Ευάγγελος, Μιμίκου Μαρία, Τεχνική Υδρολογία, Εκδόσεις Παπασωτηρίου, 2018 (6η έκδοση), ISBN: 978-960-491-125-7. Κωδικός Βιβλίου στον Εύδοξο: 77117411
- [In Greek] Τσακίρης Γ., Υδατικοί πόροι : Ι Τεχνική υδρολογία και διαχείριση των υδατικών πόρων, Εκδόσεις ΣΥΜΜΕΤΡΙΑ, 2012 (1η έκδοση), ISBN: 978-960-266-380-6. Κωδικός Βιβλίου στον Εύδοξο: 22771790
- [In Greek] Μιμίκου Μαρία Α., Τεχνολογία Υδατικών Πόρων, Εκδόσεις Παπασωτηρίου, 2006, ISBN: 978-960-7530-79-0. Κωδικός Βιβλίου στον Εύδοξο: 9780
- [In Greek] Ευθύμης Λέκκας, Φυσικές Τεχνολογικές Καταστροφές, 2000 (Β έκδοση). Κωδικός Βιβλίου στον Εύδοξο: 7632457
- [In Greek] Καλλία - Αντωνίου Αγγελική, Θεσμικό Πλαίσιο για την Προστασία και Διαχείριση Υδατικών Πόρων, Εκδόσεις Ζήτη, 2011, ISBN: 978-960-456-285-5. Κωδικός Βιβλίου στον Εύδοξο: 12718796