

COURSE OUTLINE

1. GENERAL

SCHOOL	School of Engineering		
DEPARTMENT	Department of Environmental Engineering		
LEVEL OF STUDIES			
COURSE CODE	15ΘΥ3Ν-Κ2	SEMESTER	8
COURSE TITLE	Design of water supply and sewerage networks		
TEACHING ACTIVITIES <i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i>	TEACHING HOURS PER WEEK	ECTS CREDITS	
	6	5	
<i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>			
COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i>	Scientific area, skill development		
PREREQUISITES:	Fluid Mechanics, Applied and Computational Hydraulics		
TEACHING & EXAMINATION LANGUAGE:	Greek		
COURSE OFFERED TO ERASMUS STUDENTS:	No		
COURSE URL:	https://eclass.duth.gr/courses/TMC365/		

2. LEARNING OUTCOMES

Learning Outcomes <i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i>																		
<ul style="list-style-type: none"> • Understanding the principles of water consumption estimation • Understanding the principles of water supply water transfer • Understanding the principles of design and distribution of water supply networks • Understanding the principles of design and sizing of sewerage networks • Understanding the principles of waste-water pumping stations design and sizing 																		
General Skills <i>Name the desirable general skills upon successful completion of the module</i>																		
<table border="0"> <tr> <td><i>Search, analysis and synthesis of data and information,</i></td> <td><i>Project design and management</i></td> </tr> <tr> <td><i>ICT Use</i></td> <td><i>Equity and Inclusion</i></td> </tr> <tr> <td><i>Adaptation to new situations</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Decision making</i></td> <td><i>Sustainability</i></td> </tr> <tr> <td><i>Autonomous work</i></td> <td><i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td><i>Teamwork</i></td> <td><i>Critical thinking</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Promoting free, creative and inductive reasoning</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td></td> </tr> <tr> <td><i>Production of new research ideas</i></td> <td></td> </tr> </table>	<i>Search, analysis and synthesis of data and information,</i>	<i>Project design and management</i>	<i>ICT Use</i>	<i>Equity and Inclusion</i>	<i>Adaptation to new situations</i>	<i>Respect for the natural environment</i>	<i>Decision making</i>	<i>Sustainability</i>	<i>Autonomous work</i>	<i>Demonstration of social, professional and moral responsibility and sensitivity to gender issues</i>	<i>Teamwork</i>	<i>Critical thinking</i>	<i>Working in an international environment</i>	<i>Promoting free, creative and inductive reasoning</i>	<i>Working in an interdisciplinary environment</i>		<i>Production of new research ideas</i>	
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Design and sizing of water transfer to the cities Design and sizing of water distribution networks Design and sizing of sewerage networks Design and sizing of pumping station																		

3. COURSE CONTENT

1. Introduction. Significance of water supply and sewerage networks. Water resources acquisition
2. Water consumption. Estimation of water volume needed for fire extinction purposes
3. Water transfer for water supply purposes: open channels and closed pipes. Choice of the adequate method and design principles.
4. Resolution of problems related to cavitation and water hammer occurrence in the case of long distance water transfer.
5. Sizing of water storage supply tanks and towers. Sizing of water supply pumping stations
6. Principles of design and sizing of water distribution networks.
7. Computation of hydraulic characteristics of water supply distribution networks. Method *Newton-Raphson*, method *Cross* etc.
8. Use of EPANET software for the design and sizing of water distribution networks
9. Types of sewerage networks. Combined and separate networks. Computation of the flowrates. Principles of hydraulics of sewage networks
10. Design and sizing of waste water networks. Application examples.
11. Design and sizing of storm drain and combined sewerage networks. Application examples.
12. Design and sizing of pumping stations for sewage and stormwater transport
13. Alternative systems for waste water sewerage networks. Bill of quantities for sewerage and water supply networks

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD <i>Face to face, Distance learning, etc.</i>	Face to face	
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i>	Use of ICT in Laboratory, education and Communication with Students	
TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i>	Activity	Workload/semester
	Lectures	40
	Exercises in class	6
	Laboratory (software)	6
	Analysis of the literature	48
	Homework (exercises)	50
STUDENT EVALUATION <i>Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others</i>	Course evaluation is based on the final exam	

Please indicate all relevant information about the course assessment and how students are informed

5. SUGGESTED BIBLIOGRAPHY

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ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	
Contact details:	
Supervisors: (1)	
Evaluation methods: (2)	
Implementation Instructions: (3)	

(1) Please write YES or NO

(2) Note down the evaluation methods used by the teacher, e.g.

- *written assignment or/and exercises*
- *written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.*

(3) In the **Implementation Instructions** section, the teacher notes down clear instructions to the students:

a) in case of **written assignment and / or exercises**: the deadline (e.g. the last week of the semester), the means of submission, the grading system, the grade percentage of the assignment in the final grade and **any other necessary information**.

b) in case of **oral examination with distance learning methods**: the instructions for conducting the examination (e.g. in groups of X people), the way of administration of the questions to be answered, the distance learning platforms to be used, the technical means for the implementation of the examination (microphone, camera, word processor, internet connection, communication platform), the hyperlinks for the examination, the duration of the exam, the grading system, the percentage of the oral exam in the final grade, the ways in which the inviolability and reliability of the exam are ensured and any other necessary information.

c) in case of **written examination with distance learning methods**: the way of administration of the questions to be answered, the way of submitting the answers, the duration of the exam, the grading system, the percentage of the written exam of the exam in the final grade, the ways in which the integrity and reliability of the exam are ensured and any other necessary information.

There should be an attached list with the Student Registration Numbers only of students eligible to participate in the examination.