

1.1.1 Water Supply and Sewerage Systems

GENERAL

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| SCHOOL | Engineering | | |
| ACADEMIC UNIT | CIVIL ENGINEERING | | |
| LEVEL OF STUDIES | Undergraduate | | |
| COURSE CODE | ΥΔΡ004 | SEMESTER | 6th |
| COURSE TITLE | Water Supply and Sewerage Systems | | |
| 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 | 4 | |
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| <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> | Scientific Field | | |
| PREREQUISITE COURSES: | | | |
| LANGUAGE OF INSTRUCTION and EXAMINATIONS: | Greek | | |
| IS THE COURSE OFFERED TO ERASMUS STUDENTS | No | | |
| COURSE WEBSITE (URL) | | | |

LEARNING OUTCOMES

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| <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 this course, students will be able to:</p> <ul style="list-style-type: none"> • identify and describe qualitative and quantitative water and sewerage (wastewater and stormwater) data • explain and estimate the required water supply and sewerage infrastructure in horizontal and vertical sections • examine the design of typical water supply projects (external aqueducts, reservoirs, distribution networks) • design sewage and stormwater drainage networks in an urban environment • asses hydraulic network analysis models on the computer • identify water supply and sewerage works in the relevant studies (technical report, general works layout, pipeline sections, materials, geometric features). |
| <p>General Competences <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma</i></p> |

Supplement and appear below), at which of the following does the course aim?

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| Search for, analysis and synthesis of data and information, with the use of the necessary technology | Project planning and management |
| Adapting to new situations | Respect for difference and multiculturalism |
| Decision-making | Respect for the natural environment |
| Working independently | Showing social, professional and ethical responsibility and sensitivity to gender issues |
| Team work | Criticism and self-criticism |
| Working in an international environment | Production of free, creative and inductive thinking |
| Working in an interdisciplinary environment | |
| Production of new research ideas | Others... |
| | |

- Search, analysis and synthesis of data and information
- Adapting to new situations
- Decision making
- Individual work
- Working in an interdisciplinary environment
- Project design and management
- Criticism
- Promoting free, creative and inductive thinking

SYLLABUS

1. Short course description:

The course aims to provide students with the basic theoretical and background knowledge for the core course 'YDR004 Water Supply and Sewerage Systems'. It includes the necessary material for the understanding of the basic concepts of design and dimensioning of all individual water supply and sewerage network projects in urban and semi-urban areas through a theoretical and practical (application exercises) approach.

2. Lectures' content:

- o Introduction to urban hydraulic works, historical background. Basic principles and design parameters of water supply projects.
- o Qualitative and quantitative water quality and quantity data. Sampling of springs, surface and groundwater.
- o Pumping stations and pressure mains. Calculation of water needs.
- o Siting, sizing, and design of water reservoirs and yield/reduction wells. Required elevation and sizing.
- o Design, hydraulic analysis and sizing of distribution networks. Calculation of radial and axial networks.
- o Computer models for solving water supply networks.
- o Qualitative and quantitative data of municipal/ industrial wastewater and stormwater.
- o Hydraulics of sewers.
- o Basic principles and design parameters of urban sewerage projects. Types of drainage and stormwater networks.
- o Principles of sewage network design. Flow speed limits. Minimum gradients. Couplings. Local losses. High and low velocity problems. Qualitative and technological aspects of sewerage pipelines.
- o Estimation of stormwater flows. Design principles for rainwater collection networks. Methodology for the design and calculation of rainwater networks in horizontal and vertical sections. Construction and hydrological constraints.

TEACHING and LEARNING METHODS - EVALUATION

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| DELIVERY <i>Face-to-face, Distance learning, etc.</i> | Face to face. |
| USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i> | Support of the learning process (Teaching and Communication with students) through PowerPoint lectures, through the course website, through the e-learning platform |

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| | 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 page. Teacher-student collaboration time either by physical presence or by teleconference. | |
| <p>TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><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> | Activity | Semester workload |
| | Lectures | 40 |
| | Practice/exercises | 12 |
| | Educational visit | |
| | Individual study | 50 |
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| | Course total (26 hours workload per ECTS credit) | 104 |
| <p>STUDENT PERFORMANCE EVALUATION</p> <p><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 (100% of the final grade):</p> <ul style="list-style-type: none"> • A written progress examination (30% of the final grade) including: <ul style="list-style-type: none"> _Theoretical Extended Response Questions (formative and/or inferential) _Problem-solving exercises. • Written final examination (70% of the final grade) including: <ul style="list-style-type: none"> _Theoretical extended response questions (formative and/or inferential) _Problem-solving exercises. <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.</p> <p>The outline is communicated orally to students during the first lecture.</p> | |

ATTACHED BIBLIOGRAPHY

- [In Greek] Πρίνος Παναγιώτης, 2013, Υδραυλική Κλειστών και Ανοικτών Αγωγών, Εκδόσεις Ζήτη, ISBN: 978-960-456-344-9. Κωδικός στον Εύδοξο: 2276797.
- [In Greek] Τσακίρης Γεώργιος, 2010, Υδραυλικά Έργα, Σχεδιασμός και Διαχείριση, Τόμος Ι: Αστικά Υδραυλικά Έργα, Εκδόσεις Συμμετρία, ISBN: 978-960-266-289-2. Κωδικός στον Εύδοξο: 45485.
- [In Greek] Λαγγούσης Ανδρέας, Φουρνιώτης Νικόλαος, 2020, ΣΤΟΙΧΕΙΑ ΣΧΕΔΙΑΣΜΟΥ ΕΡΓΩΝ ΥΔΡΕΥΣΗΣ ΚΑΙ ΑΠΟΧΕΤΕΥΣΗΣ, Εκδόσεις GOTSIS, ISBN: 9789609427890. Κωδικός στον Εύδοξο: 94702516.
- [In Greek] Δημητρακόπουλος Αλέξανδρος, 2008, Σχεδιασμός Υδραυλικών Έργων, Εκδόσεις Φ. ΦΩΤΟΠΟΥΛΟΣ - Α. ΧΑΡΑΛΑΜΠΑΚΗΣ Ο.Ε., ISBN: 978-960-88473-1-6. Κωδικός στον Εύδοξο: 456.
- [In Greek] Στάμου Αναστάσιος, 2016 (3η έκδ.), Εφαρμοσμένη Υδραυλική, Εκδόσεις Παπασωτηρίου, ISBN: 978-960-491-109-7. Κωδικός στον Εύδοξο: 59397206.