### Hydraulics

**GENERAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SCHOOL** | Engineering | | | | |
| **ACADEMIC UNIT** | Civil Engineering | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** | ΥΔΡ003 | **SEMESTER** | | 5th | |
| **COURSE TITLE** | Hydraulics | | | | |
| **INDEPENDENT TEACHING ACTIVITIES** *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* | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
|  | | | 4 | | 5 |
|  | | |  | |  |
|  | | |  | |  |
| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).* | | |  | |  |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | Scientific Field | | | | |
| **PREREQUISITE COURSES:** |  | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes | | | | |
| **COURSE WEBSITE (URL)** |  | | | | |

**LEARNING OUTCOMES**

|  |  |
| --- | --- |
| **Learning outcomes** | |
| *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.*  *Consult Appendix A*   * *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area* * *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B* * *Guidelines for writing Learning Outcomes* | |
| Upon completing this course students should be able to recognize the basic rules governing hydraulic flow in civil engineering systems related to water distribution in open channels and closed pipes. | |
| **General Competences** | |
| *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?* | |
| *Search for, analysis and synthesis of data and information, with the use of the necessary technology*  *Adapting to new situations*  *Decision-making*  *Working independently*  *Team work*  *Working in an international environment*  *Working in an interdisciplinary environment*  *Production of new research ideas* | *Project planning and management*  *Respect for difference and multiculturalism*  *Respect for the natural environment*  *Showing social, professional and ethical responsibility and sensitivity to gender issues*  *Criticism and self-criticism*  *Production of free, creative and inductive thinking*  *……*  *Others…*  *…….* |
| 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**

|  |
| --- |
| Description of the fundamental principles of water behavior and introduction to the topics of flow in open channels and closed pipes. Introduction to methods for the hydraulic analysis and design of water networks    Content of theory lectures:  • Physical and mechanical properties of soils.  • Laboratory measurements and field tests.  • Water flow in porous soils and its effect on he mechanical behavior of the soil.  • Soil stresses and deformations.  • Shear strength of soil.  • Stability of soil slopes. |

**TEACHING and LEARNING METHODS - EVALUATION**

|  |  |
| --- | --- |
| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face to face. |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | 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. |
| **TEACHING METHODS**  *The manner and methods of teaching are described in detail.*  *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.*  *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* | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 32 | | Practice/exercises | 10 | | Practice/exercises | 10 | | Project(s) | 10 | | Individual study | 68 | |  |  | |  |  | |  |  | |  |  | | Course total (26 hours workload per ECTS credit) | ***130*** | |
| **STUDENT PERFORMANCE EVALUATION**  *Description of the evaluation procedure*  *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.* | Language of Evaluation: Greek. Written test with extended answer questions (formative and/or inferential). Theory assessment (90% of the final grade): • A written progress examination (30% of the final grade) including: \_Theoretical Extended Response Questions (formative and/or inferential) \_Problem-solving exercises. • Written final examination (60% of the final grade) including: \_Theoretical extended response questions (formative and/or inferential) \_Problem-solving exercises. Laboratory assessment (10% of the final grade): • Written assignment on laboratory exercises. 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. |

**ATTACHED BIBLIOGRAPHY**

• [In Greek] Πρίνος Παναγιώτης, Υδραυλική Κλειστών και Ανοικτών Αγωγών, Εκδόσεις Ζήτη, 2013, ISBN: 978-960-456-344-9. Κωδικός Βιβλίου στον Εύδοξο: 22767973  
• [In Greek] Λιακόπουλος Αντώνης, Υδραυλική, Εκδόσεις ΤΖΙΟΛΑ, 2020 (3η έκδοση), ISBN: 978-960-418- 775-1. Κωδικός Βιβλίου στον Εύδοξο: 77107649  
• [In Greek] Στάμου Αναστάσιος, Εφαρμοσμένη Υδραυλική, Εκδόσεις Παπασωτηρίου, 2016 (3η έκδοση), ISBN: 978-960-491-109-7. Κωδικός Βιβλίου στον Εύδοξο: 59397206  
• [In Greek] Σούλης Ιωάννης, ΥΔΡΑΥΛΙΚΗ, Εκδόσεις ΧΑΡΑΛΑΜΠΟΣ ΝΙΚ. ΑΪΒΑΖΗΣ, 2012, ISBN: 978-960- 549-001-0. Κωδικός Βιβλίου στον Εύδοξο: 22714197  
• [In Greek] Δημητρακόπουλος Αλέξανδρος, ΣΤΟΙΧΕΙΑ ΥΔΡΑΥΛΙΚΗΣ ΚΛΕΙΣΤΩΝ ΚΑΙ ΑΝΟΙΚΤΩΝ ΑΓΩΓΩΝ, Εκδόσεις GOTSIS, 2018, ISBN: 978-960-9427-72-2. Κωδικός Βιβλίου στον Εύδοξο: 77119353