

1.1.1 Dams and Earth Structures

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	FEQ016	SEMESTER	9th
COURSE TITLE	Dams and Earth Structures		
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	No		
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, the student will be able to:</p> <ul style="list-style-type: none"> • Recognize and understand the different types of dams and appreciate the importance of the required accompanying constructions. • Evaluate the basic physical and mechanical parameters of soil materials and select those suitable for the construction of dams and related earth structures. • Distinguish and evaluate the possible causes of failure in earth dams and propose solutions based on the knowledge acquired during the lectures. • Conduct basic stability checks for the dam construction. • Prescribe the fundamental parameters of the accompanying constructions for the proper operation of a dam. • Propose an appropriate monitoring plan for assessing the dam behavior and evaluate the respective results. <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?

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, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Working in an interdisciplinary environment
- Project planning

SYLLABUS

Study of various types of dams and accompanying soil constructions (e.g. slopes) based on the respective code provisions. Development of topics such as underground water flow, soil permeability, excavation problems and their mitigation.

Content of theory lectures and exercises:

- Introduction to the subject - necessity of dams and earthworks.
- Presentation of different types of dams and accompanying structures - basic principles of earth dam construction - physical characteristics of utilized soil materials.
- Soil permeability, groundwater flow, water flow networks.
- Study of earth dams and accompanying structures based on literature and code provisions.
- Problems and causes of failure in earth dams and their mitigation – presentation of historic cases. Monitoring the dam behavior with instrumentation.

TEACHING and LEARNING METHODS - EVALUATION

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>	Lecture presentations using computer and projector, in person or by teleconference (remotely) if required. Support of the learning process through the e-learning platform and electronic communication with students (online announcements and comments, e-mail, announcements on the Department's website etc.). If required, support of students by using teleconference tools and software.	
TEACHING METHODS <i>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-</i>	Activity	Semester workload
	Lectures	26
	Practice/exercises	26
	Practice/exercises	30
	Individual study	48

<i>directed study according to the principles of the ECTS</i>	Course total (26 hours workload per ECTS credit)	130
<p style="text-align: center;">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>Written final examination including:</p> <ul style="list-style-type: none"> • Theoretical knowledge and judgment questions on course subjects • Solving problems-exercises <p>Written assignment (compulsory) which includes:</p> <ul style="list-style-type: none"> • Processing and solving exercises-problems • Assessment of understanding key concepts of the course 	

ATTACHED BIBLIOGRAPHY

- [In Greek] Σαχπάζης Κ. (2018), "Γεωτεχνική Μηχανική των Φραγμάτων", Εκδόσεις Τσαπραΐλη Χρυσάνθη, ISBN: 978-618-83547-0-8
- [In Greek] Τσόγκας Χ.Ε. (2018), "Υδροδυναμικά Έργα", Εκδόσεις ΖΗΤΗ, ISBN: 978-960-456-509-2
- [In Greek] Μαραγκός Δ. (2000), "Τεχνικά Έργα Υποδομής (2η έκδοση)", Εκδόσεις Νικόλαος Μαραγκός, ISBN: 960-7834-00-3