1.1.1 Foundations Retaining Walls

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΕΩ004	**SEMESTER**	6th
COURSE TITLE	Foundations Retaining Walls		

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	No
COURSE WEBSITE (URL)	https://elearning.cm.ihu.gr/course/view.php?id=711

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*

The aim of the course is to help the student understand the theoretical principles in the subjects of Foundations and Retaining Structures and the ability to computationally address basic problems in classic applications of Foundations. Upon successful completion of the course, the student will be able to:

• Recognize, understand and evaluate the basic physical and mechanical parameters of soil and construction related to the study and analysis of foundations and retaining walls.

• Distinguish and understand the different foundation cases, as well as the type and behavior of retaining structures.

• Study a single shallow foundation by investigating in detail, based on the existing regulatory framework, the required failure checks in bearing capacity, settlements, overturning, sliding, uplift, bending, shearing and punching. Also, calculate the required reinforcement (foundation detailing).

• Estimate the developing forces and design the foundation tie-beams.

• Calculate bearing capacity of piles and pile settlement.

• Calculate the earth pressures and design a retaining wall.

• Synthesize solutions based on the course contents, evaluating the requirements of the problem at hand, support the proposed solutions and compare and choose the most suitable between different

approaches.

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…
…….

- Search, analysis and synthesis of information and data
- Decision making
- Working independently
- Project planning

SYLLABUS

Study, analysis and design of various types of foundations (reinforced concrete shallow and deep foundations) and retaining walls. It includes the computation of internal forces, the calculation of the loading at foundation level and the required procedure to determine the reinforcement and configuration of the examined structural elements based on the current code regulations.

Content of theory lectures and practical exercises:

- Relation to Soil Mechanics (soil characteristics, soil stresses, soil bearing capacity and settlements, based on literature formulas and code regulations).
- Study of shallow foundations and theoretical application in the design of surface footings. Detailed application to individual footings including the description of design rules, footing stability checks (overturning, sliding, uplift), foundation soil bearing capacity and settlement checks, and design of concrete footings (in bending, shearing, punching) including calculation of required reinforcement.
- Study and design of foundation tie-beams.
- Study of bearing capacity and settlement of pile foundations (individual piles and pile group).
- Study and design of reinforced concrete retaining walls.

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*	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 *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*	

Activity	*Semester workload*
Lectures	26
Practice/exercises	26
Practice/exercises	30
Individual study	48

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*		
	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.*	Written final examination including: • Theoretical knowledge and judgment questions on course subjects • Solving problems-exercises Written assignments (submitted in stages) and oral examination including: • Processing and solving exercises-problems of foundations and retaining walls • Assessment of understanding of key concepts of the course	

ATTACHED BIBLIOGRAPHY

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• [In Greek] Γεωργιάδης Κ., Γεωργιάδης Μ. (2009), "Στοιχεία Εδαφομηχανικής", Εκδόσεις ΖΗΤΗ, Θεσσαλονίκη, ISBN: 978-960-456-157-5
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• [In Greek] Γραμματικόπουλος Γ., Μάνου-Ανδρεάδου Ν., Χατζηγώγος Θ. (2015), "Εδαφομηχανική: ασκήσεις και προβλήματα (2η έκδοση)", Αφοι Κυριακίδη, Θεσσαλονίκη, ISBN: 978-618- 5105-87-7
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• [In Greek] Bowles J.E. (2009), "Θεμελιώσεις: Τόμος Ι", Εκδόσεις Φούντας, Αθήνα, ISBN:9789603306658
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