

1.1.1 Soil – Structure Interaction

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	FEQ017	SEMESTER	9th
COURSE TITLE	Soil – Structure Interaction		
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</p> <p><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 concepts related to the phenomenon of soil - foundation - structure interaction. • Distinguish and evaluate the basic key parameters and soil and structural behavior that influence the interaction phenomenon. • Comprehend the effects of interaction on the structural behavior and dynamic response. • Study the influence of interaction in simple cases of foundations or in complex soil-structure systems using specialized software. 								
<p>General Competences</p> <p><i>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?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"><i>Adapting to new situations</i></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td style="border: none;"><i>Decision-making</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>Showing social, professional and ethical responsibility and</i></td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>		<i>Showing social, professional and ethical responsibility and</i>
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<i>Decision-making</i>	<i>Respect for the natural environment</i>							
	<i>Showing social, professional and ethical responsibility and</i>							

<i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> <i>.....</i> <i>Others...</i> <i>.....</i>
<p>The course contributes to the following skills:</p> <ul style="list-style-type: none"> • 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

<p>Soil-foundation-structure interaction in above-ground and underground constructions. Concept of interaction under static and dynamic loading and examination of the phenomenon and effects of interaction in shallow foundations, embedded foundations, pile foundations and underground structures, based on state-of-the-art literature approaches and code provisions.</p> <p>Content of theory lectures and application exercises:</p> <ul style="list-style-type: none"> • Introduction to soil – foundation – structure interaction. Case studies and examples. • Soil and structural parameters affecting interaction under static and dynamic response. • Foundation on compliant ground conditions - Winkler method. • Pile-soil interaction under axial and lateral loading. • Soil-structure interaction in underground constructions. • Dynamic soil-foundation-structure interaction. • Code provision related to the study interaction phenomena. • Historical examples. • Use of specialized software to employ for the simulation of interaction problems.
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TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face to face.	
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	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.	
<p>TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <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-</i></p>	<p>Activity</p>	<p>Semester workload</p>
	Lectures	26
	Practice/exercises	26
	Practice/exercises	30
	Individual study	48
Course total (26 hours workload per ECTS credit)		130

<i>directed study according to the principles of the ECTS</i>	
<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] Κωμοδρόμος Α.Μ. (2008), "Υπολογιστική Γεωτεχνική Μηχανική: Αλληλεπίδραση Εδάφους-Κατασκευών", Εκδόσεις Κλειδάριθμος, ISBN: 978-960-461-201-7
- [In Greek] Γκαζέτας Γ., Αναστασόπουλος Ι, Γαρίνη Ε., Γερόλυμος Ν. (2016), "Αλληλεπίδραση Εδάφους-Θεμελίου-Κατασκευής (2η έκδοση)", Εκδόσεις Τσότρας, ISBN: 978-618-5066-68-0
- Wolf J.P. (1986), "Dynamic Soil-Structure Interaction", Prentice-Hall, ISBN: 0132215659.