

COURSE OUTLINE

(1) GENERAL

SCHOOL	POLYTECHNIC - UNIVERSITY OF THESSALY		
ACADEMIC UNIT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE (LEVEL 7)		
COURSE CODE	TE1106	SEMESTER	9 ^o
COURSE TITLE	SPECIAL TOPICS OF GEOTECHNICAL ENGINEERING		
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	6
<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, specialized general knowledge, skills development</i>	Specialized General Knowledge		
PREREQUISITE COURSES:	SOIL MECHANICS I, SOIL MECHANICS II, EXPERIMENTAL SOIL MECHANICS (Prerequisite knowledge of these course, without the requirement of successful exam)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/CULT_U_151/		

(2) LEARNING OUTCOMES

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> <i>Consult Appendix A</i> <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>
The students: - assimilate the knowledge on: (a) graphic presentation of stress state and stress history of soil – Mohr circles and stress paths, (b) pore water pressure parameters, (c) engineering soil behaviour, experimental soil mechanics tests and affecting parameters, (d) maximum, critical and residual shear strength, (e) soil stiffness, and (f) soil models (critical state theory, plasticity theory) - interpret geotechnical data, analyse geotechnical problems, choose the appropriate tests for the determination of stress – strain relation, predict soil behaviour and assess design soil parameters for static and dynamic loadings.

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?

<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>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive</i>
<i>thinking Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>

Literature survey and information management by means of ICT

Development of critical thinking in the selection of soil parameter for geotechnical design and the evaluation of geotechnical analysis results

Familiarity with the selection of soil models for the geotechnical analysis of technical projects

(3) SYLLABUS

Course contents:

1. Stresses, strains and Mohr cycles – Stress paths – Theory of Elasticity – Presentation of stress state and stress history of soils
2. Pore water pressure – Parameters A and B
3. Laboratory tests for the determination of stress – strain relation
4. Mechanical behavior of soil under fully drained conditions
5. Mechanical behavior of soil under undrained conditions
6. Shear strength of sandy soils (dry and saturated)
7. Shear strength of cohesive soils (dry and saturated)
8. Soil stiffness: stiffness modulus and damping ratio
9. Critical state theory
10. Residual shear strength of soils
11. Effect of soil structure, stress history, strain and rate of loading on mechanical behaviour of soils
12. Evaluation of design soil parameters
13. Pre – failure soil state – Elastic wall – Yield surfaces – Theory of plasticity on soils

(4) 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>	Use of laptop and projector in the classroom for the lectures. Communication between teacher and students by means of eclass and emails. Educational material and announcements to students are posted on eclass. The announcements are also published on the Department's web site. Students conduct homework by means of computer programmes. Students conduct literature research using internet and particularly the website of university library and search engines	
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,</i>	<i>Activity</i>	<i>Semester workload</i>
	Lectures – Theory	20
	Exercises in the classroom	36
	Homework exercises	30
	Homework study	30
	Preparation for the exams	35

<i>clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <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>	Final exams	3
	Course total	154
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure <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> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>		
The language of evaluation is greek. At the first lesson, a diagnostic assessment of prerequisite students' knowledge on Soil Mechanics course takes place by means of an optional test. The assessment of students' learning performance is formative. It includes (a) homework exercises at the end of every chapter, and (b) the participation in the final exam at the end of semester. The final exam is written and includes a number of exercises with some questions on theory, which cover the entire teaching subject. The learning goals of the course, the examination methods and evaluation criteria of student are communicated in the first lesson, so it is clear to them that the knowledge targets are combined with the development of various skills.		

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

Course lectures & selected notes of the teacher posted in eclass (in greek)

Elements of Soil Engineering, M. Kavvadas

<http://users.ntua.gr/kavvadas/Books/books.htm> (in greek)

Notes: Soil Mechanics III. Th. Tika (in greek)

Soil Mechanics: Principles and Practice - Graham E. Barnes

Soil Mechanics and Foundations. M. Budhu

Mohr Circles, Stress Paths and Geotechnics. R. Pary

Critical State Soil Mechancis. A. Schofield and C. Wroth

- Related academic journals:

Geotechnical Testing Journal

Journal of Geotechnical and Geoenviromental

Engineering Geotechnique

Geotechnical and Geological Engineering Canadian

Geotechnical Engineering

Soils and Foundations