COURSE OUTLINE

(1) GENERAL

SCHOOL	**POLYTECHNIC - UNIVERSITY OF THESSALY**		
ACADEMIC UNIT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**ΓΚ2202**	**SEMESTER**	6ο
COURSE TITLE	SOIL MECHANICS II		

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, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	SOIL MECHANICS I (Prerequisite knowledge of Soil Mechanics I course, without the requirement of successful exam in this course)
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/CULT_U_150/

(2) 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 students:

1. assimilate the principles of geotechnical design of technical projects
2. learn the theories and methods used for the assessment of (a) groundwater flow in soil, (b) consolidation time of structure settlements, (c) earth pressures and gravity walls design, (d) slope stability, and (e) bearing capacity and shallow foundations design
3. develop their critical thinking during the geotechnical survey of technical projects and the study of soil behaviour (inhomogeneous and anisotropic medium with no prescribed properties) in comparison to other technical and construction materials, such as concrete and steel.
4. develop professional and ethical responsibility regarding the design and the effects of technical projects in society and natural environment.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking Working in an interdisciplinary environment*
Production of new research ideas	*……*
	Others…
	…….

Literature survey and information management by means of ICT
Implementation of geotechnical design methods in technical projects
Ability of using tables, regulations and codes in the design of technical projects
Development of critical thinking in the selection of soil parameter for geotechnical design and the evaluation of geotechnical analysis results
Development of technical perception and good perception of space
Survey and production of alternative technical solutions
Decision making ability and problem solving
Development of professional and ethical responsibility for the design of technical projects with respect to the natural environments and sensitivity to social demands

(3) SYLLABUS

Course contents:

1. Water seepage through soil
2. 1D water flow through soil & Darcy's law
3. 2D water flow through soil
4. Time dependence of consolidation settlement
5. Foundation settlements
6. Rankine soil pressures: Active and Passive failure
7. Coulomb soil pressures: Active and Passive failure
8. Design of gravity walls retaining dry and saturated soil
9. Planar failure of soil slopes
10. Limit equilibrium of shallow footing
11. Bearing capacity of shallow foundation (Terzaghi)
12. Bearing capacity of shallow foundation (Meyerhof, Hansen, Vesic)
13. Bearing capacity of shallow foundation (EC7)

(4) 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*	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 *The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis*	

Activity	*Semester workload*
Lectures – Theory	12
Exercises in the classroom	42
Classroom laboratory: Design of water flownet	2

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*	Homework exercises	10
	Homework study	32
	Preparation for the exams	25
	Final exams	3
	Course total	126

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.*	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 final exam for the evaluation of students' performance is written and conducted at the end of the semester. It includes a number of exercises with some questions on theory. The learning goals of the course, the examination methods and evaluation criteria of studenst 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)

Soil Mechanics: Principles and Practice - Graham E. Barnes

Elements of Soil Engineering. K. Georgiadis & M. Georgiadis (in greek)

Elements of Soil Engineering, M. Kavvadas
http://users.ntua.gr/kavvadas/Books/books.htm) (in greek)

Soil Engineering Notes, G. Gazetas

- Related academic journals:

Journal of Geotechnical and Geoenviromental
Engineering Geotechnique
Geotechnical and Geological Engineering
International Journal of Geotechnical
Engineering Canadian Geotechnical
Engineering
Soils and Foundations
Geotechnical Engineering,
ICE