

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED SCIENCES		
DEPARTMENT	ENVIRONMENTAL ENGINEERING		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	GE5440	SEMESTER OF STUDY	4 ^o
COURSE TITLE	SOIL MECHANICS II		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
Lectures-Project presentations-educational excursions.		5	5
COURSE UNIT TYPE	SC: Specialization Courses		
PREREQUISITES:	Soil Mechanics I		
LANGUAGE OF INSTRUCTION/EXAMS:	Greek/English		
COURSE DELIVERED TO ERASMUS STUDENTS	YES		
MODULE WEB PAGE (URL)	http://geope.teikoz.gr/undergraduate/ug_studies.htm		

2. LEARNING OUTCOMES

<p>Learning Outcomes</p> <ul style="list-style-type: none"> • <p>The course aims to provide the necessary knowledge upon subjects relevant to Soil Mechanics II and Geotechnical Engineering studies of geotechnical projects so that the students will be able to cope with similar subjects and especially:</p> <ol style="list-style-type: none"> 1. To understand soil properties effecting its composition and mechanical behaviour. 2. To apply laboratory methods and field tests in order to determine soil's parameters and properties, and the appropriate usage of the soil as construction material for projects and also as load bearing material for engineering projects. 3. To organize laboratories for soil's properties determination. 4. To Analyse and Resolve specific issues of Soil Mechanics II / Geotechnical Engineering (Earth Pressures – Earth Retaining Structures, Slope Stability Analysis- Landslides, Slope and Landslide Stabilization Techniques, Elastic & Consolidation Settlements as well as Differential Settlements, Bearing Capacity of Foundations, Ground Improvement of Foundation Soils of Projects, etc). 5. To Use appropriate software to model, analyse and solve the above mentioned geotechnical engineering issues using a computers and CAD methods.
<p>General Skills</p> <p><i>Upon successful completion of the programme students will:</i></p> <ul style="list-style-type: none"> -have the basic theoretical and practical knowledge in the fields of the subject area of Geotechnology and Environmental Engineering -be able to properly apply the theoretical and practical knowledge acquired during the study period -be able to cover a wide spectrum of scientific and technical knowledge related to mining and geotechnical projects as well as the sector of environmental reclamation -have gained the necessary competencies to proceed to their second cycle study.
<ul style="list-style-type: none"> • Independent Work • Teamwork • Work in a multidisciplinary environment • Design and project management • Respect the natural environment

- Search, analyze and synthesize data and information, and the use of essential technologies

3. COURSE CONTENTS

- Types and engineering behaviour of soils.
- In situ measurements of soil.
- Strength properties.
- Friction and cohesion.
- Triaxial compression.
- Cohesion and cohesionless soils.
- Permeability.
- Penetrometers.
- Compaction.
- Compressibility and consolidation.
- Vertical slope.
- Calculation of bearing capacity of foundation soils by analytical methods.
- Determination of bearing capacity of foundation soil by in situ tests.
- Calculation of Elastic & Consolidation Settlements as well as Differential Settlements.
- Methods for calculating earth thrusts of soils on Earth Retaining Structures.
- Methods for calculating earth thrusts of soils on Earth Retaining Structures by in situ tests.
- Design and construction of earth retaining structures & anchored Piled Retaining Walls.
- Slope Stability Control & Landslides.
- Slope and Landslide Stabilization Techniques.
- Methods of analysis of the stability of slopes.
- Instrumentation and monitoring of landslides.
- Description and classification of soils for geotechnical projects .
- Ground Improvement of Foundation Soils of Projects.
- Slope & Foundation Failure Criteria.
- Foundations, Footings Support of excavations.
- Foundation beams.
- Pile foundations.

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY.	In classroom, face to face lectures and seminars.	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY <i>Χρήση Τ.Π.Ε. στη Διδασκαλία, στην Εργαστηριακή Εκπαίδευση, στην Επικοινωνία με τους φοιτητές</i>	<ul style="list-style-type: none"> • Lectures assisted by power point presentations and group comprehension exercises. Educational tours and excursions. • Contact between instructor and students via email. 	
TEACHING METHODS	<i>Method description</i>	<i>Semester Workload</i>
	Classroom lectures	39
	Laboratory exercises	39
	Independent and Directed Study	10
	Total work load hours of lesson	88
ASSESSMENT METHODS <i>Περιγραφή της διαδικασίας αξιολόγησης</i>	Formally written examination at the end of the semester on the theoretical background, oral presentations in classroom and assessment of laboratory exercises & skills on selected topics relevant to Soil Mechanics II and Geotechnical Engineering studies of geotechnical projects.	

	Laboratory and / or Coursework: 40.00%, Formal examination at the end of the semester: 60.00%.
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5. RESOURCES

- SACHPAZIS, C., "Lecture Notes on Soil Mechanics II issues: 1) Soil Compaction, 2) Permeability, 3) Shear strength of soils, 4) Consolidation, 5) Lateral Earth Pressures, 6) Geotechnical Site Investigation, and 7) Introduction to Geotechnical Engineering", 2011. (ΣΑΧΠΑΖΗΣ, Κ., «Σημειώσεις Εδαφομηχανικής II σε θέματα: 1) Συμπύκνωση των Εδαφών, 2) Περρατότητα και Διήθηση Διαμέσου των Εδαφών, 3) Διατμητική Αντοχή των Εδαφών, 4) Στερεοποίηση των Αργίλων, 5) Πλευρικές Ωθήσεις Γαιών, 6) Γεωτεχνική Διερεύνηση Υπεδάφους, και 7) Εισαγωγή στη Γεωτεχνική Μηχανική», 2011).
- S. TSOTSOS, «Soil Mechanics», Ververidis & Polichronidis Publications, Thessaloniki, 1991. (ΣΤΕΦΑΝΟΣ ΤΣΟΤΣΟΣ, «Εδαφομηχανική», Εκδόσεις Φ. Βερβερίδη και Π. Πολυχρονίδη Θεσσαλονίκη, 1991).
- Bowles, J.E., (1997). Foundation Analysis and Design. 5th Edn., McGraw-Hill, New York. (Same).
- BARNES GRAHAM, «Soil Mechanics: Principles and Applications», Klidarithmos Publications, Athens, 2005, ISBN: 960-209-883-X. (BARNES GRAHAM, «Εδαφομηχανική: Αρχές και εφαρμογές», Εκδόσεις Κλειδάριθμος, Αθήνα, 2005, ISBN: 960-209-883-X.).
- JOHN ATKINSON, «Introduction of Soils and Foundations» Mc Graw Hill, 1993. (Same).