

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED SCIENCES		
DEPARTMENT	Department of Environmental Engineers/ Division of Environmental Geo-technology & ngineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	GE5750	SEMESTER OF STUDY	7th
COURSE TITLE	Exploitation and Processing of Marbles & Aggregates		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
Lectures, Field Work, Laboratory Exercises		4	5
COURSE UNIT TYPE		SC: Specialization Courses	
PREREQUISITES :	None		
LANGUAGE OF INSTRUCTION/EXAMS:	Greek		
COURSE DELIVERED TO ERASMUS STUDENTS	Yes		
MODULE WEB PAGE (URL)	http://geope.teikoz.gr/undergraduate/ug_studies.htm		

2. LEARNING OUTCOMES

Learning Outcomes

The course aims to provide to the students the necessary knowledge for the exploitation and processing of marbles and various aggregate materials. Specifically provides knowledge for:

- Design and implementation of the exploitation of a marble and aggregate quarry.
- Selection of the right exploitation method for a marble quarry.
- Choose the relative quality control tests for marbles and aggregates.

Utilize the by-products and the waste material produced from the marble and aggregate quarries.

General Skills

Upon successful completion of the programme students will:

- 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

On successful completion of this module the learner will be able to :

1. To choose the right exploitation method for a marble or an aggregate quarry
2. To design and construct a marble processing plant.
3. To choose and carry out the relative quality control tests for marbles and aggregates.

3. COURSE CONTENTS

The marble industry in Greece, historical data, present situation, investigation of the main economic parameters, geological exploration, main parameters to evaluate a marble deposit, exploration in regional scale, exploration methods, feasibility studies. Main exploitation methods, open-pit and underground exploitation. Marble's exploitation methods (dense parallel drillings, using steel wire cable, using diamondiferous wire), use of explosive materials. Means for the ablation of excavated products, loading and transportation means of quarry products. Elaboration of marbles and decorative stones, products of standard dimensions, products of art, storing and disposal of products, exploitation of sub-products, quality control of marbles, production of final products. Physic-mechanical qualities of marbles, specific weight, water absorption, elasticity coefficient, tension-compression strength, friction strength, percussion strength, strength towards the effect of low concentration acid solutions, thermal expansion coefficient, micro hardness Knoop.

Legislation for the exploitation of aggregate materials. Aggregate quarries and their applications.

Exploitation methods (drilling geometry, blasting, loading, transportation), elaboration methods (fracture, separation, products of modern ripper), search and quality control methods, classification of aggregate materials, erosion, health index, plate index, elongation index, specific and apparent weight, mechanical behaviour of aggregates, British specifications tests, non British specifications tests (Los Angeles, Deval), resistance to fracture and friction.

4. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	Face – to - face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Power point presentations and self-assessment test in the Blackboard. Students are contacted by e-mail.	
TEACHING METHODS	<i>Method description</i>	<i>Semester Workload</i>
	Lectures	45
	Field Work	10
	Laboratory Exercises	45
	Autonomous Study	25
	Total	125
ASSESSMENT METHODS	Written Examination, Oral Presentation, tests, written assignments. 1. Each lab exercise is examined orally and by a written test. The laboratory examination of each subject must be successful. 2. At the end of each lecture, students are asked to answer a number of questions related to the lecture. 3. For the final grade counts the performance in the laboratory exercises (45%), the field work (10%) and the written exam at the end (45%).	

5. RESOURCES

- *Recommended Book Resources:*

1. CETMA (2002) The SME's organization in the Ornamental Stone sector in Italy – the case of Apulia. 184 pp.
2. ELOT 408 (1979) Draft of the Greek Norm. Crushed aggregates for typical concrete works pp. 26

3. K. Tsakalakis (2006) "Notes of the lesson concrete technology". N.T.U.A. Department of Mining – Metallurgical Engineers p. 81
4. Prototype Technical Specification O-150 Constructing the road sub-base. Circular Γ9/66.
5. Prototype Technical Specification O-155 Constructing the road base , Circular Γ10/66.
6. Dobrowolski, J (1998) Concrete Construction Handbook 4th Edition McGraw – Hill. Chapter 2 and 3.
7. S. Platias. (2011) «Notes of the lesson Exploitation & Processing of marbles and aggregate quarries», TEI of Western Macedonia
Ornamental and Dimensional Stones Network , Volumes 4,6,8,9,12,13.