

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED SCIENCES		
DEPARTMENT	Department of Environmental Engineers/ Division of Environmental Geo-technology Engineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	GE5350	SEMESTER OF STUDY	3rd
COURSE TITLE	Exploitation I		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
Lectures, Field Work, Laboratory Exercises		5	6
COURSE UNIT TYPE	SC		
PREREQUISITES :	None		
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

Learning Outcomes

The course aims to provide the necessary knowledge upon subjects relevant to the exploitation of field mines, so that the students will be able to cope with relevant subjects and especially with :

- Designing a field excavation
- Methods of excavation, loading, transportation, disposal, combined with their field of application (alluvial deposits, marbles decorative stones, lignite deposits)
- Factors influencing slope inclination
- Production program
- Productivity and supervision of exploitation's operation

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. Design an open pit exploitation

2. Choose the right exploitation method depending on the characteristics of the deposit and the topography of the region.
3. Improve the mine productivity and organize the production program
4. Design the long term mine evolution and programming all the different steps of the production cycle.

3. COURSE CONTENTS

- Definitions, Prospecting, Exploration, Development, Exploitation, Reclamation, Mine Production Cycle, Development of the mineral industry, methods for deposits evaluation.
- Open - pit planning, Pit limit analysis, Bench design, Road design. Methods employed in the main production phases (excavation, loading, hauling, waste disposal).
- Excavation methods: open pit mining, quarrying, open cast – strip mining, highwall mining, Alluvial mining, placer mining, solution mining.
- Economic aspects of slope angle, Slope stability, Economic aspects of cut-off grade, Production scheduling,
- Innovative mining methods, remote control, mechanization, automation, robotics, ocean mining, nuclear mining, space mining, clean mining.
- Case Studies

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
ASSESSMENT METHODS	<p>Written Examination, Oral Presentation, tests, written assignments.</p> <p>1. Each lab exercise is examined orally and by a written test. The laboratory examination of each subject must be successful.</p> <p>2. At the end of each lecture, students are asked to answer a number of questions related to the lecture.</p> <p>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%).</p>	

5. RESOURCES

- *Recommended Book Resources:*

X.N.Apostolidis: "Complementary notes of Exploration", N.T.U.A., Athens, 1988.

I.N. Economopoulos : 'Surface Exploration ', N.T.U.A. Athens, 1989.

S. Platias «Notes of the lesson Exploration I» TEI of Western Macedonia 2010

AIME : "Surface Mining" 2nd Ed. Kennedy 1990

American Geological Institute "A dictionary of Mining, Mineral and Related Terms" 2nd Ed. 1997
Bise C. J.: Mining engineering analysis, AIME, Society of mining Engineers Inc., Littleton, Colorado, 1986.

Hartman H. "Introductory Mining Engineering" New York 2nd Edition 2002.

Kennedy B. A. (ed.): 'Surface mining. 2nd edition', AIME, Society of mining Engineers Inc., Littleton, Colorado, 1990.

- *Recommended Article/Paper Resources:*

1. United States Geological Survey www.usgs.gov
2. University of Missouri-Rolla www.mining.umar.edu
3. Mining Technology www.infomine.com
4. ASARCO www.asarco.com
5. Society of Mining Engineers www.smenet.org
6. Mining Technology www.mining-technology.com
7. Mining USA www.miningusa.com
8. U.S. Geological Survey www.minerals.er.usgs.gov
9. U.S. Environmental Protection Agency www.epa.gov
10. N.I.O.S.H. www.cdc.gov/niosh/homepage.html
11. Mining www.mine-engineer.com

12. Colorado School of Mines www.mines.edu/Academic/mining

13. Mine Safety and Health Administration www.msha.gov

14. Queensland www.nzw.qld.gov.au/mines/

15. YΠEKA www.latomet.gr

SC: Specialization Courses