

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED SCIENCES		
DEPARTMENT	ENVIROMENTAL ENGINEERING (ENVIROMENTAL GEOTECHNOLOGY ENGINEERING)		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	GE5130	SEMESTER OF STUDY	1 st
COURSE TITLE	CHEMISTRY-CHEMICAL TECHNOLOGY		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
Lectures καὶ Laboratory work		3 Lect.+2Lab.	6
COURSE UNIT TYPE	GBC		
PREREQUISITES :	Non		
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
<p>The course introduces students to fundamental concepts of chemistry and aims on enable students to understand courses related with chemistry, comprehend the production procedure in chemical industry and to apply the theoretical knowledge on chemical analysis</p> <p>On successful completion of this module the learner will be able to:</p> <ul style="list-style-type: none"> • Comprehend the fundamental concepts of chemistry • Comprehend the basic chemical concepts and processes which take place in engineering chemistry <p>Carry out simple chemical analysis</p>
General Skills
<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"> • Retrieve, analyse and synthesise data and information, with the use of necessary technologies • Work autonomously • Work in teams • Work in an interscientific context

- Respect natural environment

3. COURSE CONTENTS

THEORY

- Atomic Structure
- Compounds and bonding
- Aqueous Solutions
- Chemical Reactions
- Chemical Equilibrium
- Chemical Kinetics
- Acids and Bases
- Redox Reactions
- Introduction to Organic Chemistry
- Utilization of raw materials
- Chemical processes and chemical reactors
- Ores – metallurgy – production of metals
- Production of ceramics, cements and glasses
- Production of polymers (thermoplastics, thermosets and elastomers)
- Technology of industrial water
- Technology of fuels

LAB

- Laboratory safety rules and regulations
- Chemical laboratory experiments on quantitative analysis (water hardness, fasmatophotometry) physical-chemical parameters determination (density, viscosity, refractive index, pH, reaction velocity) , electrochemical reactions (lead battery etc) and chemical technology (metal purification methods, aluminium anodizing, corrosion and protection)

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. Student contact electronically.	
TEACHING METHODS	<i>Method description</i>	<i>Semester Workload</i>
	Lectures	50
	Laboratory work	30
	Report writing	30
	Autonomous study	40

	Total contact hours and training	150
ASSESSMENT METHODS	<p><i>Theory</i></p> <ol style="list-style-type: none"> 1. Written intermediate Examination (40%) 2. Final written Examination (60%) including: Short answer questions, extended answer questions , exercises solution <p><i>Lab</i></p> <ol style="list-style-type: none"> 1. Oral Examination on each lab exercise, Written reports for laboratory exercise (60%) <p>Final Examination (40%)</p>	

5. RESOURCES

- Recommended Book Resources:

1. Χημική Τεχνολογία, Α. Σ. Βατάλης, Εκδ.Ζήτη Πελαγία & Σια Ο.Ε., Θεσ/νίκη, 2004
2. Εργαστηρικές Ασκήσεις Χημείας - Χημικής Τεχνολογίας, Α. Σ. Βατάλης, Λ.Τσικριτζής, Κοζάνη, 2008
3. Chemistry (Experimental and Theory), B.J.Segal, J.Wiley & Sons, Inc., New York, 2nd ed., 1989.
4. Engineering Chemistry, R. Gopalan, D.Venkappayya, S.Nagarajan, Vikas, New Delhi, 1999.
5. Πανεπιστημιακή Χημεία, J.L. Rosenberg, L.M. Epstein, Εκδ. «Κλειδάριθμος», Αθήνα, 2004
6. Χημική τεχνολογία, Καλκάνης Γεώργιος, Χατήρης Ιωάννης, Εκδ. Σ.Παρίκου & ΣΙΑ ΕΕ, Αθήνα, 1998.

- Recommended Article/Paper Resources: