

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	243KEY	SEMESTER	6
COURSE TITLE	Research methods in environmental engineering		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Theory (8 Lectures)		3	
Laboratory (1 experiment)		4	
Field Trip (2 trips)		3	
Total credits			6
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	Introduction to Environmental Engineering Research methods I		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (tutorials)		
COURSE WEBSITE (URL)	http://www.env.aegean.gr/studies/undergraduate-degree/curriculum/research-methods-in-environmental-engineering/		

(2) LEARNING OUTCOMES

Learning outcomes
1. To understand the main stages of research procedure in environmental engineering 2. To understand the basic principles of environmental sampling and analysis 3. To apply chemical methods for the evaluation of water pollution and wastewater characteristics 4. To organize field sampling and environmental analyses 5. To interpret the scientific results 6. To evaluate/compare the experimental results with literature data 7. To organize the written and oral presentation of the experimental results
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Working independently Design of sampling campaigns Criticism Decision making

(3) SYLLABUS

The course consists of 8 lectures, 2 field trips and 1 laboratory exercise.

1. Introduction, course objectives, evaluation
2. Research principles in aquatic pollution and wastewater treatment: literature review, sampling, samples' storage & conservation
3. Samples collection from Mytilene's STP (field trip)
4. Samples collection from Evargetoulas STP and Evergetoulas River, measurement with portable instruments (field trip)
5. Chemical analyses of basic pollutants (COD, TSS) (laboratory exercise)
6. Research principles in aquatic pollution and wastewater treatment: data statistical treatment
7. Research principles in aquatic pollution and wastewater treatment: data interpretation and presentation
8. Methodology for writing and presenting diploma thesis
9. Methodology for writing and presenting scientific articles and announcements
10. Presentation of a case study in the research field of aquatic pollution and wastewater treatment
11. Preparation of course essay: distribution of roles, schedule, possible risks
12. Oral presentation of course essay
13. Submission of written course essay

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY.	Face to face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Power Point, Use of e-mail	
TEACHING METHODS	Activity	Semester workload
	Lectures	24
	Field trip	6
	Laboratory Exercises	4
	Essay writing	45
	Literature analysis	65
	Course total	144
STUDENT PERFORMANCE EVALUATION	Language of evaluation: Greek A. Submission of written essays presenting the major findings of lab analyses and experiments (60%) B. Oral presentation of the major findings of lab analyses and experiments (40%)	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Βλυσίδης, Μάη, Μπαραμπούτη (2015) Βιομηχανική Ρύπανση, Εκδόσεις Ι. ΣΙΔΕΡΗΣ
- Liu and Liptak (1996) Environmental Engineering Handbook, Lewis Publishers
- Li and Miglaccio (2010) Water quality concepts, sampling and analyses, CRC Press
- APHA (2012) Standard methods for the examination of water and wastewater, 22nd edition
- Metcalf and Eddy (2006) Μηχανική Υγρών Αποβλήτων, 4η έκδοση, τόμος Α, Εκδόσεις Τζιόλα

- Related academic journals:

- Water Research
- Science of the Total Environment
- Chemosphere
- Environmental Pollution
- Science of the Total Environment