ENVIRONMENTAL HEALTH

SCHOOL	TECHNOLOGY		
DEPARMMENT	ENVIRONMENT		
LEVEL OF EDUCATION	*Undergraduate*		
LESSON CODE	**NEW COURSE**	**SEMESTER**	8nd
LESSON TITLE	Environmental Health and Safety		

INDEPENDENT TEACHING ACTIVITIES *if credit units are awarded to distinct parts of the course eg. Lectures, Laboratory Exercises etc. If credits are united for the whole course, list the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDIT UNITS**
THEORY	4	4
EXERCISES	1	1
Add rows if necessary. The teaching organization and the teaching methods used are described in detail in 4.		

TYPE OF COURSE *Background, General Knowledge, Scientific Area, Skills Development*	BACKROUND
PRELIMINARY COURSES:	NO
LANGUAGE OF TEACHING AND EXAMS:	GREEK
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
COURSE website (URL)	

1. **LEARNING OUTCOMES**

Learning outcomes

Describe the learning outcomes of the course and the specific knowledge, skills and abilities that students will acquire upon successful completion of the course.

Refer to Annex A.

- *Description of the Level of Learning Outcomes for each course of study according to the Qualifications Framework of the European Higher Education Area*
- *Descriptive Indicators of Levels 6, 7 & 8 of the European Lifelong Learning Qualifications Framework*

and Annex B.

- *Summary Guide for Writing Learning Outcomes*

The aim of the Environmental Health and Safety Course is to provide the trainee with knowledge related to the management of the health and safety quality of the water and air environment and to focus particularly on the microbiology and the infections related to it. The modules taught offer, among other things, knowledge of aquatic microbiology derived from environments of different origins, pathogenic activity and how microbes are transmitted to humans, preventive measures and ways to deal with water quality control problems. The course incorporates all applicable legislation that sets the objective criteria for quality, hygiene and safety of the aquatic environment and water for human consumption, natural environment water for recreation, and artificial environment water for recreation. It also aims to provide the student with knowledge about air pollution, related diseases and the factors that lead to its increase. In addition Incorporates guidelines, decisions and regulations in both Greece and the European Union regarding air pollution. Finally, in the laboratory exercises of the course it analyzes the modern laboratory techniques of isolation and cultivation of its environment and the factors that are dangerous for it.

The purpose of the course is:

1. Undergraduate students understand basic concepts that are developed in the course.

2. Students should be able to apply the knowledge they have acquired in the course to other courses in the following semesters related to Biology, Geology etc.
3. Students must meet the requirements of "Good Laboratory Practice" in subsequent Laboratory courses of the Department's curriculum or other undergraduate or postgraduate curricula.
4. Students evaluate, analyze and calculate laboratory measurement data and write laboratory reports.
5. Students should be able to apply the knowledge they have acquired in the course to solving environmental problems.

General Competences

In view of the general competences that the graduate must have acquired (as listed in the Diploma Supplement and listed below) in which of them does the course aim?

Search, analyze and synthesize data and information, using the necessary technologies	*Project planning and management*
Adaptation to new situations	*Respect for diversity and multiculturalism*
Decision making	*Respect for the natural environment*
Independent work	*Demonstrate social, professional and ethical responsibility and gender sensitivity*
Teamwork	*Exercising criticism and self-criticism*
Working in an international environment	*Promoting free, creative and inductive thinking*
Working in an interdisciplinary environment	
Generation of new research ideas	

- Search, analyze and synthesize data
- Decision making
- Independent Work
- Teamwork
- Respect for the natural environment
- Exercising criticism and self-criticism
- Promote free, creative and inductive thinking

2. COURSE CONTENTS

Theory content

1. Introduction - Definitions - what is public health.
2. Microbiology of water-aquatic ecosystems
3. Quality drinking water
4. Quality of recreational water of natural environment
5. Quality bottled water
6. Quality of recreational water of artificial environment (swimming pools, baths, spa).
7. Microbial analysis of water safety indicators
8. Bacterial Aquatic Infections: E. Coli, Coliforms, Enterobacteriaceae, Salmonella, Shigella, Yersinia, E.coli, Legionella.
9. Atypical Mycobacteria, Campylobacter, parasites, chemical causes.
10. Viral waterborne infections: Adenoviruses, astroids, hepatitis A and E viruses, enteroviruses, Norwalk-viruses.
11. Examples of waterborne infections from around the world, but also in hospitals or elsewhere.
12. Atmospheric air chemical composition (solar radiation, humidity, wellness zone)
13. Impacts of air pollution on health
14. Prevention of air pollution

Exercises content

1. Microbial analysis of water safety indicators.
2. Bacterial Aquatic Infections: E. Coli.
3. Bacterial Aquatic Infections: Coliforms
4. Bacterial Aquatic Infections: Enterobacteriaceae

5. Bacterial Aquatic Infections: Salmonella
6. Visit exercise to the meteorological station of the University of Thessaly in Geopolis campus

3. **TEACHING AND LEARNING METHODS - EVALUATION**

HOW TO TEACH THE COURSE **Face to face, Distance learning etc.**	• Amphitheater lectures and • laboratory exercises in the lab.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES **Use of ICT in Teaching, in Laboratory Education, in Communication with Students**	• Use Powerpoint slides. • Communication with students via e-mail. • Using the e-class
TEACHING ORGANIZATION **The method and methods of teaching are described in detail.** **Lectures, Seminars, Laboratory Exercise, Field Exercise, Study & Bibliographic Analysis. Tutorial, Internship, Interactive Teaching, Study Tours, Project Design, Work / Work Writing, etc. The student study hours for each learning activity are recorded as well as the non-instructional study hours so that the overall workload at semester level corresponds to ECTS standards.**	

Activity	***Semester Workload***
Theory	40
Practical Exercises	30
Laboratory exercises	0
Independent study of theory	30
Weekly individual laboratory assessment evaluation reports	
Total Course	**100**

STUDENTS ASSESSMENT *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Inferential, Multiple Choice Assessment, Short Answer Questions, Problem Development Questions, Problem Solving, Written Thesis, Report / Report, Oral Examination, Public Presentation, Practical, Artistic, Laboratory Others* *Specify clearly defined assessment criteria and if and which are accessible to students.*	I. ***Evaluation in theory*** • Evaluation is done writen • Evaluation in theory can only be carried out once the laboratory exercises have been completed. • The grade is 70% of the final gradeII. II. ***Evaluation in exercises*** **Laboratory evaluation includes:** • Completion of laboratory exercises • Written examination **exercises grade: 30%** **Final grade** **70% theory grade + 30% exercises grade**

- Suggested Bibliography *:*

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892.
3. 4.WHO launches first-ever international guidelines on creating safe places to swim and bathe https://www.who.int/mediacentre/news/notes/2006/np15/en/
4. https://www.cdc.gov/healthywater/drinking/index.html
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7. Pedati C, Koirala S, Safranek T, Buss BF, Carlson AV. Campylobacteriosis Outbreak Associated with Contaminated Municipal Water Supply - Nebraska, 2017. MMWR Morb Mortal Wkly Rep. 2019 Feb 22;68(7):169-173
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9. Sánchez-Parra B, Núñez A, Moreno DA. Preventing legionellosis outbreaks by a quick detection of airborne Legionella pneumophila. Environ Res. 2019 Apr; 171:546-549.
10. Perkins KM, Reddy SC, Fagan R, Arduino MJ, Perz JF. Investigation of healthcare infection risks from water-related organisms: Summary of CDC consultations, 2014-2017. Infect Control Hosp Epidemiol. 2019 Apr 3:1-6. doi: 10.1017/ice.2019.60
11. Hill D. Basic microbiology for drinking water 2nd edition, Amer water works association 2006
12. Li H, Yang J, Ye B, Jiang D. Pollution characteristics and ecological risk assessment of unheeded metals in sediments of the Chinese Xiangjiang River. Environ Geochem Health. 2018 Dec 13. doi: 10.1007/s10653-018-0230-9
13. Sun Z, Zhu D. Exposure to outdoor air pollution and its human health outcomes: A scoping review. PLoS One. 2019 May 16;14(5)
14. Pawankar R Climate change, air pollution, and biodiversity in Asia Pacific: impact on allergic diseases. Asia Pac Allergy. 2019 Apr 3;9(2):e11
15. https://www.who.int/airpollution/en/
16. https://www.who.int/airpollution/guidelines/en/

Supplementary Bibliography

Lecturer's notes and full material on theory lectures and introductory lab presentations available through the asynchronous education platform