COURSE OUTLINE

1. COURSE INFORMATION

SCHOOL	Chemical and Environmental Engineering		
DEPARTMENT			
COURSE LEVEL	Postgraduate		
COURSE ID		**SEMESTER**	Winter
COURSE TITLE	Solid and Toxic Waste Management		

COURSE MODULES *in the case of credits being awarded in distinct parts of the course eg. Lectures, Laboratory Exercises, etc. If credit units are awarded uniformly for the whole course, indicate the weekly hours of teaching and the total number of credits.*	**INSTRUCTION HOURS PER WEEK**	**CREDITS**
Lectures	2	
Laboratories		
Tutorial Exercises	1	
Total	3	5
Add rows if needed. The teaching organization and teaching methods used are described in detail in (4).		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skills Development*	General knowledge, Scientific area
PREREQUISITES:	Basic biology, chemistry, and geochemistry knowledge
INSTRUCTION/EXAM LANGUAGE:	English
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes
COURSE URL:	EURECA PRO LMS Moodle URL: https://moodle.eurecapro.tuc.gr/course/view.php?id=81

2. LEARNING OUTCOMES

Learning Outcomes
The learning outcomes of the course describe the specific knowledge, skills and competences of an appropriate level that students will acquire after successfully completing the course.

After completing this course, the student will be able to:

- Understand basic principles on solid and hazardous waste management
- Apply the best approach based on waste properties and characteristics
- Design collection and transportation systems
- Estimate the landfill size or treatment facilities for specific case studies
- Determination of physicochemical characteristics of degradation products (landfill leachate, biogas)
- Perform risk assessment

General Competencies/Skills
Considering the general competencies that the graduate must have acquired (as listed in the Diploma Supplement and below), which one(s) the course enhances?

- Search, analysis and synthesis of data and information, using the necessary technologies
- Autonomous work
- Teamwork
- Working in an international environment

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- Working in an interdisciplinary environment
- Production of new research ideas

3. COURSE SYLLABUS

1st Week: Introduction to Integrated Solid Waste Management

2nd Week: Reduce, Reuse, Recycle, Recovery… The Rs of Solid Waste Management

3rd Week: Biological Conversion Technologies (aerobic composting)

4th Week: Biological Conversion Technologies (anaerobic digestion)

5th Week: Thermal Conversion Technologies (incineration)

6th Week: Advanced Thermal Systems (pyrolysis, gasification, air pollution control)

7th Week: Waste disposal

8th Week: Landfill design

9th Week: Hazardous waste: Main characteristics, classification, labeling, toxicology and risk analysis

10th Week: Physico-chemical and thermal treatment of hazardous waste

11th Week: Disposal of hazardous waste

12th Week: Dioxins (PCDDs), Furans (PCDFs) and Polychlorinated Biphenyls (PCBs)

13th Week: Project presentation and discussion

4. TEACHING and LEARNING METHODS – ASSESSMENT

LECTURE METHOD *Face to face, distance learning, etc.*	Distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, in Laboratory Exercises, in Communication with students*	Power point presentations; Moodle support

TEACHING ORGANISATION

Describe in detail the way and methods of teaching.
Lectures, Seminars, Laboratory Exercise, Field Exercise, Literature review & analysis, Tutoring, Practice (Placement), Clinical Exercise, Artistic Lab, Interactive teaching, Educational visits, Project work, project, etc.

The student's study hours for each learning activity and the hours of non-guided study according to the ECTS principles are mentioned.

ACTIVITY	***Workload per semester (in Hours)***
Lectures	26
Tutorials	13
Assignment and Project	26
Autonomous study	60
Course Total (25 hours' workload/ECTS credit)	***125***

ASSESSMENT METHODS *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Public Presentation, Laboratory Assignment, Clinical Examination of Patients, Artistic Interpretation, Other* *Well defined student assessment criteria are mentioned. Mention whether and how the students can access them.*	• Oral exam (50%) • Final project report (25%) • Project presentation and discussion (25%)

5. DIGITIZATION (use of tools & software)

Power point presentation

6. RECOMMENDED INTERNATIONAL LITERATURE

- Tchobanoglous G., Kreith F. (2002) Handbook of Solid Waste Management (2nd Ed.). McGraw-Hill, USA.
- Chandrappa R., Das D.B. (2012) Solid Waste Management: Principles and Practice. Springer, Germany.
- Unnisa S.A, Rav S.B. (2012) Sustainable Solid Waste Management. Taylor & Francis, USA.
- Christensen T.H. (2011) Solid Waste Technology and Management. Wiley, UK.

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