ΠΕΡΙΓΡΑΜΜΑ ΜΑΘΗΜΑΤΟΣ

FACULTY/SCHOOL	TECHNOLOGY		
DEPARTMENT	ENVIRONMENTAL SCIENCES		
LEVEL OF STUDY	*Undergraduate*		
COURSE UNIT CODE	**NEW COURSE**	**SEMESTER**	F (6^{th})
COURSE TITLE	AIR POLLUTION & ANTIPOLLUTION TECHNOLOGIES		

INDEPENDENT TEACHING ACTIVITIES In case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits	**WEEKLY TEACHNG HOURS**	**CREDITS**
THEORETICAL BACKGROUND	4	5
Προσθέστε σειρές αν χρειαστεί. Η οργάνωση διδασκαλίας και οι διδακτικές μέθοδοι που χρησιμοποιούνται περιγράφονται αναλυτικά στο 4.	4	5

COURSE TYPE Background knowledge, Scientific expertise, General Knowledge, Skills Development	BACKGROUND
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION &EXAMINATION/ASSESSMENT:	GREEK
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A: Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework. Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and

APPENDIX B: Guidelines for writing Learning Outcomes

The purpose of the course is for the student to become acquainted with the nature of air pollutants, and their sources of emission. It will also cover secondary air pollutants (photochemical pollution).

The student will learn the major antipollution technologies both for collecting particulates as well as reducing other pollutants in air emissions such as oxides of nitrogen and sulfur, carbon monoxide and organic in nature pollutants.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies, Adapting to new situations Decision-making Individual/Independent work Group/Team work, Working in an international environment, Working in an interdisciplinary environment, Introduction of innovative research, Project planning and management, Respect for diversity and multiculturalism, Environmental awarenesss, Social, professional and ethical responsibility and sensitivity to gender issues, Critical thinking, Development of free, creative and inductive thinking.

- Search, analyze and synthesize data and information, using the necessary technologies
- Decision making
- Autonomous work
- Teamwork
- Project design and management
- Respect for the natural environment
- Promoting free, creative and inductive thinking

(3) COURSE CONTENT

Theory

Introduction into air pollution, classes of air pollutants, physical and anthopogenic sources of air pollutants, secondary air pollution, temperature inversion, global warming, stratospheric ozone depletion, acid rain, carbon dioxide cycle, particultes: introduction to particle mechanics, particle size distribution. Paricle collecting technologies: sedimentation chambers, dust collectors (air bags-filtration), cyclones, wet scrubbers, venturi scrabbers, electrostatic precipitators, design of cyclones and electrostatic precipitators. Technologies for removing oxides of nitrogen and sulfur from air emissions. Use of catalytic chemistry as an antipollution technology. The car catalytic converter.

(4) TEACHING METHODS-ASSESSMENT

MODES OF DELIVERY **Face-to-face, in-class lecturing, distance teaching and distance learning etc.**	• Lectures in the classroom or by distance • Team discussion • Laboratory exercises
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY **Use of ICT in teaching, Laboratory Education, Communication with students**	• Powerpoint. • View video material • e-mail. • e-class
COURSE DESIGN **Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of**	

Activity	*Semester Workload*
Lectures	52
Problem solving	20
Team Working-Laboratory	10
Educational visits	5

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<td>bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc. The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</td>
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<table>
<tr><td>Homework(s)</td><td>18</td></tr>
<tr><td>Individual Theory Study</td><td>20</td></tr>
<tr><td>Course total (25 hours of workload per credit unit)</td><td>125</td></tr>
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<td>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS
Detailed description of the evaluation procedures:

Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, openended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc.

Specifically, defined evaluation criteria are stated, as well as if and where they are accessible by the students.</td>
<td>• Midterm (optional, exam or homework assignment) = 40%
• 60% final exam, or 100% if midterm exam is not given</td>
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<tr>
<td colspan="2"><u>SUGGESTED BIBLIOGRAPHY:</u>
1. C. D. Cooper, F.C. Alley, Έλεγχος αέριας ρύπανσης: σχεδιασμός αντιρρυπαντικής τεχνολογίας, Εκδόσεις Τζιόλα, 2004
2. Γεντεκάκης, Ι., «Ατμοσφαιρική ρύπανση - Επιπτώσεις, έλεγχος και εναλλακτικές τεχνολογίες». 2η Έκδοση, Κλειδάριθμος, 2010.
3. Σ. Ραψομανίκης & Ε. Καστρινάκης, «Βασικές αρχές αντιρρυπαντικής τεχνολογίας ατμοσφαιρικών ρύπων", Εκδ. Τζιόλα, Θεσσαλονίκη, 2009.
4. N. de Nevers, “Air Pollution Control Engineering”. 2nd Ed., McGraw-Hill Book, Co., 2000.
5. R.A. Corbitt, "Standard Handbook of Environmental Engineering", McGraw-Hill, 1990.

<u>Complementary bibliography</u>

Instructor class notes</td>
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