COURSE OUTLINE
"AIR POLLUTION AND AIR POLLUTION ABATEMENT TECHNOLOGIES"

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
DEPARTMENT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	661001	SEMESTER	1st
COURSE TITLE	**"AIR POLLUTION AND AIR POLLUTION ABATEMENT TECHNOLOGIES"**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
Lectures		**6**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Scientific Area
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	http://www.environmentalprotection.gr/?page_id=152

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course constitutes an introduction to basic concepts of air pollution.
An analysis is given on:

- the anthropogenic and natural sources, the types of air pollution, the effect of meteorological phenomena and parameters,
- the relevant European and national legislation, the methods and standards of measurements, instrumentation, the standard and non-standard methods of sampling and measurement, the calibration and control procedures,
- air-quality assessments, the long term and short term action plans, industrial accidents, national emission ceilings, industrial emissions, introduction to noise.

The course aims to the comprehension of basic aspects of air quality and the control of air pollution. In addition, it aims to review the basic guidelines of the legislation regarding the industry and air pollution in Greece and EU.

After the successful completion of the course, the students will be able:

1. to understand basic aspects on air pollution and the quality of atmospheric environment
2. to describe and clearly understand the sources causing the air pollution
3. to clearly understand, interpret and explain aspects regarding the air pollution and also to estimate, assess and came to conclusions
4. to perform statistical analysis of pollutant concentration and compare to limit values
5. to evaluate different types of air pollution and the means of abatement control
6. to carry out write-ups and reports based on measurements

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…

1. Search, analysis and synthesis of data and information using and applying the required technologies
2. Decision Making
3. Autonomous work
4. Teamwork
5. Respect for the natural environment

(3) COURSE CONTENT

- Air pollution, anthropogenic and natural sources, the types of air pollution, the effect of meteorological phenomena and parameters.
- The relevant European and national legislation, the methods and standards of measurements, instrumentation, the standard and non-standard methods of sampling and measurement, the calibration and control procedures.
- Air-quality assessments, industrial accidents, national emission ceilings, industrial emissions, introduction to noise, long term and short term action plans.

(4) TEACHING & LEARNING METHODS – EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face, distance learning</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>▪ Access to data bases and special coding software for search and management of information using ICT.
▪ Communication and electronic submission.
▪ Support of teaching through the website.
▪ Presentation in PP, video and linking with specialized websites through the Internet.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Study of bibliography</td><td>53</td></tr>
<tr><td>Educational visits (laboratory demonstration of experimental apparatus & devices)</td><td>3</td></tr>
<tr><td>Preparation and homework for project (individual or group work)</td><td>25</td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
<tr><td>Total Course</td><td>150</td></tr>
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</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</td><td>Multiple choice exam (50%)
Written work (30%)
Technical Report (20%)</td></tr>
</table>

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	

(5) ATTACHED BIBLIOGRAPHY

1. ΥΠΑΠΕΝ, Ετήσια Έκθεση Ατμοσφαιρικής Ρύπανσης 2014
2. Υπουργείο Περιβάλλοντος & Ενέργειας http://www.ypeka.gr/Default.aspx?tabid=488&language=el-GR
3. Ευρωπαϊκός Οργανισμός Περιβάλλοντος http://www.eea.europa.eu/el/themes/air/intro
4. Παγκόσμιος Οργανισμός Υγείας http://www.who.int/phe/health_topics/outdoorair/en/
5. http://eur-lex.europa.eu/search.html?DC_CODED=2527&type=advanced&qid=1455875867619