COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
DEPARTMENT	DEPARTMENT OF ELECTRICAL & ELECTRONICS NGINEERING		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	**EEE.4.8**	**SEMESTER**	**4**
COURSE TITLE	Energy and Environment		

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	2	3
Exercises		
Total	2	
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*	Specialization Course
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English for Erasmus students)
COURSE WEBSITE (URL)	http://moodle.teipir.gr/course/view.php?id=408

(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 aims to familiarize students with the European directives relating to the design, construction and operation of electrical equipment and installations and associated with the environment. Upon completion of the course, students will have acquired:

1. In-depth knowledge and critical understanding of the connection of energy generation and usage with the environment.
2. Knowledge of the energy efficiency and energy savings demand in everyday life and ability to recognize and select equipment and devices based on this criterion. Also, ability to perform the studies and work and assess their results considering this parameter.
3. Knowledge and ability to use the principles of ecological design (Eco-Design) in his/her professional activity.
4. Knowledge of the alternative but closely related activity and professional

engagement fields, while coming into contact with new environmental regulations that define the design and operation and the end of life cycle of electrical equipment and installations.

5. Knowledge of the legislation on the end of life treatment and recycling potential of waste electrotechnical equipment
6. In depth understanding of the relationship of the profession of Electrical Engineering and the environment and their interdependence.
7. Ability to apply this knowledge in his/hers business life.

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

The course aims at fostering the following capabilities:

1. Search for, analysis and synthesis of data and information, with the use of the necessary technology
2. Decision making
3. Independent work
4. Work in a multidisciplinary environment
5. Project planning and management
6. Respect for the natural environment
7. Production of free, creative and inductive thinking

(3) COURSE CONTENT

The theory part of the course consists of the following modules:

1st Module: Energy and environmental policies and their interdependence.
2nd Module: Energy generation and the environment, greenhouse gass emissions and climate change.
3rd Module: Energy efficiency and energy saving: Introduction to energy efficiency in products and systems.
4th Module: The European Directives Eco-label, Energy-label, Eco-design, RoHs, EMAS, and their application to equipment and various industrial devices
5th Module: The life cycle analysis in the production and operation of the equipment
6th Module: End-of-life of waste electrical, electronic and industrial equipment. Legislation
7th Module: Designing systems in accordance with the instructions for EcoDesign.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures and exercises, Face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Teaching using ICT, Communication and Electronic Submission

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*	
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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Evaluation Language : Greek English for Erasmus students **Theory** Final Written Exams: 100% **Individual Project** Final report + presentation : 100% The grade of the course is 70% x Theory + 30% x Individual project

Activity	*Semester workload*
Lectures	26
Individual project	12
Personal Study	52
Course total	90

(5) ATTACHED BIBLIOGRAPHY

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2. WRI and WBC for Sustainable Development, (2005), The Greenhouse Gas Protocol, Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects, WRI Report.
3. EEA, (2005), Climate change and a European low-carbon energy system, EEA, Copenhagen.
4. EEA, (2007), Europe's Environment: The 4th Assessment, EEA, Copenhagen.
5. Wimmer W., Züst R., and Lee K.-M., (2004), ECODESIGN Implementation - A systematic guidance on integrating environmental considerations into product development. Springer, Berlin.
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7. Williams E., Lotstein R., Galik C., Knuffman H., (2007), A Convenient Guide to Climate Change Policy and Technology, CLIMATE CHANGE POLICY PARTNERSHIP, Duke University, Durham
8. Jayamaha L., (2007), Energy-Efficient Building Systems: Green Strategies for Operation and Maintenance, McGraw-Hill Professional Publishing, N York
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12. Solmes L., (2009), Energy Efficiency: Real Time Energy Infrastructure Investment And Risk Management, Springer
13. Instructor's Notes