ETY201 - PHYSICS II

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ETY201	**SEMESTER**	2
COURSE TITLE	PHYSICS II		

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	4	4
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	http://www.materials.uoi.gr/en/0,02,01.html

(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 primary objective of the course is to educate and familiarize the student with the basic principles of electricity - magnetism that form the basis for the subsequent description of the electrical and magnetic properties of a material or its behavior under the influence of an electric or magnetic field. Understanding simple physics problems is required for further exploring and interpreting the complex material science exercises. Optics, Interference and Diffraction will introduce the student to the basic concepts related to the optical properties of materials. For these reasons, students' reflection and active involvement in discussions and problem solving on the black board during the semester plays an important role.

At the end of the lesson the student should be able to:

- Actively involved in the teaching-learning process
- Determines the electric, magnetic and electromagnetic field a material of a specific geometry might create (charged or leaky current, static or moving).
- Describes the electrical and magnetic forces exerted on a material in the presence of an electric or magnetic field.

• Interpret the phenomena of electromagnetism and formulate hypotheses eg. for transmitting energy and signal of electromagnetic waves in telecommunications.
• Designs solar cells of tiny (nm) thicknesses that absorb or scatter light.
• Designs the geometry and dielectric characteristics of the capacitor.
• Interprets everyday phenomena such as polished asphalt in summer.

Gaining experience in the basic concepts of Physics II will form the basis for the study of electrical, magnetic and optical properties of materials in a variety of technological applications.

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…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Team work
- Criticism and self-criticism
- Respect for the natural environment
- Production of free, creative and inductive thinking

(3) SYLLABUS

This course provides the introduction to the Electromagnetism and Optics and the essential background required to follow the specialized topics that follow. The content of the course is as follows:

1. Electrical charge and electric field.
2. Gauss's Law.
3. Electric potential.
4. Capacitance and Dielectrics.
5. Current, Resistance, and Electromotive Force.
6. Direct-Current Circuits
7. Magnetic field and magnetic forces.
8. Sources of Magnetic Field.
9. Electromagnetic induction.
10. Inductance.
11. Alternating current.
12. Electromagnetic waves.
13. Nature and propagation of light.
14. Geometric Optics.
15. Interference.
16. Diffraction.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In class, lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Electronic platform e-course

Use of ICT in teaching, laboratory education, communication with students	
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.*	LANGUAGE OF EVALUATION: Greek METHOD OF EVALUATION: (i) Final written examination

Activity	***Semester workload***
Lectures	39
Fieldwork	13
Self-study	48
Course total	100

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

- Physics II H.D. Young, Papazisis Press, 1995, Athens
- Physics II R.A.Serway, Kleidaritmhos Press, 1990, Athens

-Related academic journals: