COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	2601002	**SEMESTER**	1
COURSE TITLE	Physics		

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 (ECTS)**
Lectures	4	7
Laboratory	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*	General Background Course
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)
COURSE WEBSITE (URL)	http://e-physics.teipir.gr/HN/physics1.htm

(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 aim of the course is to provide students a solid foundation in key areas of core Physics. The issues covered in the course are presented by putting emphasis on applications. The teaching method is based on lecture courses and laboratory work aiming to help students both to understand the basis of knowledge in Physics and to master analytical and experimental skills.

Upon successful completion of this course module, the student is expected to be able to:

- Know and be able to explain orally the basic laws of the taught physics areas (Kinematics and Dynamics);
- Understand and explain orally the difference between electricity and magnetism; draw elementary electric and magnetic circuits; name quantities and explain their nature and units; distinguish among various types of electromagnetic field applications;
- Apply the laws of Physics taught to solve simple and complex problems belonging to the

covered subjects (Kinematics and Dynamics, Electricity, Magnetism, etc.);

- Apply the principle of Conservation of Energy to solve simple and complex Kinematics and Dynamics problems;
- Understand and explain orally and by sketching the notion of oscillation, the waveforms and the periodicity;
- Compute basic parameters of an oscillating signal or system; apply the wave equation taught for the computation of values for an oscillatory signal;
- Understand the basic theories on the nature of light; name and classify light sources, optical devices and optical circuits; use laws of Physics to compute basic conditions and parameters for light emission and LED operation;
- Name and briefly describe major laws, assumptions and open issues in Atomic and Nuclear Physics.

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
- Working independently
- Team work

(3) COURSE CONTENT

Lectures:

Fundamental elements of Classical Physics. Introduction to :

1. Kinematics
2. Dynamics
3. Conservation of energy
4. Electricity
5. Magnetism
6. Oscillations
7. Waves and wave equation
8. Optics
9. Atomic and Nuclear Physics.

Laboratory

1. Measurements and errors
2. Graphical representation of experimental results
3. Measurement of the acceleration of gravity using a simple pendulum

4. Evaluation of the constant of a spring
5. RLC circuits
6. Measurement of the velocity of light
7. Measurement of the internal resistance of a battery
8. Transformer
9. Study of the efficiency of a photovoltaic cell
10. Gamma ray absorption in matter
11. Study of a laser
12. Measurement of the efficiency of a lamp

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of electronic presentation with multimedia content in class, • Student support through the course webpage and the departmental e-learning platform, • Electronic communication of instructors and students, through the course webpage and by e-mail, • Use of specialized circuit simulation software.
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*	Lectures, laboratory experiments, assignments, study.

Activity	***Semester workload (hours)***
Lectures	52
Study for lectures	52
Homework assignments	26
Laboratory experiments	26
Report on lab experiments	26
Study and preparation for exams	28
Course Total	***210***

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.*	**Final grade** = Theory part grade x 60% + Lab part grade x 40% ***Theory Part grade:*** Final written exam (80%) Homework (20%) ***Lab part grade:*** Average of all grades received at each weekly Lab Experiment.

(5) ATTACHED BIBLIOGRAPHY

Recommended Books

1. SERWAY, R.A., *Physics for Scientists and Engineers*, University Physics, Berkeley, USA
2. YOUNG, H.D., *University Physics,* Berkeley Physics Course, USA