Physics for Chemists

1. GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	CHEMISTRY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**PH111**	**SEMESTER**	**1st**
COURSE TITLE	PHYSICS FOR CHEMISTS		

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*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures	4	5
Seminars	1	
Laboratory work	-	
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
PREREQUISITE COURSES:	There are no prerequisite courses. The required knowledge of Advance Mathematics (Vectors-Derivatives-Integrals) will be developed during the courses in the case where they have not been covered (temporally) by the corresponding course of Mathematics that is taught also in the first semester.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be however performed in English in case foreign students attend the course.
IS THE COURSE 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 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*

At the end of this course the student should be able to:

1. Understand the fundamental principles of Physics.
2. Apply these principles in the fields of Chemistry.

Comprehend the operation of optical and electric/electronic instruments that he uses.

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 *Project planning and management*

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

At the end of the course the student will have further developed the following skills/competences:

1. Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to Physics.
2. Ability to safely handle appliances and instruments of measurement/ diagnosis.
3. Ability to adopt and apply methodology for the solution of unfamiliar problems.
4. Ability to interact with others on inter or multidisciplinary problems.

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

Production of new research ideas

Promotion of free, creative and inductive thinking

Respect to natural environment

3. SYLLABUS

OPTICS: Nature of light and laws of Geometric Optics. Image Formation. Interference of light waves. Diffraction and Polarization.

ELECTRICITY AND MAGNETISM: Electric Fields. Gauss's Law. Electric Potential. Capacitance and Dielectrics. Current and Resistance. Direct Current Circuits. Magnetic Fields. Sources of the magnetic field. Faraday's Law. Alternative Current Circuits. Electromagnetic Waves.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures and seminars face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Lectures using transparencies, PowerPoint presentations and multimedia.
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,*	Final written examination. Greek grading scale: 1 to 10. Minimum passing grade: 5.

Activity	*Semester workload*
Lectures (4 contact hours per week x 13 weeks)	52
Seminars (1 contact hour per week x 13weeks) - solving of representative problems	13
Final examination (3 contact hours)	3
Hours of private study of the student for the preparation of the Final Examination	57
Course total	***125***

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.*	

5. ATTACHED BIBLIOGRAPHY

1. R.A. Serway, "Physics for Scientists and Engineers", 3rd edition, Vol. II: Electricity and Magnetism, Vol. III: Thermodymics-Waves-Optics, Translation: L. Resvanis, Bookshop G. Korfiati, 1990.
2. H.D. Young, "University Physics", Vol. II: Electromagnetism-Optics-Modern Physics, Translation: E. Anastasakis, S.D.P. Vlassopoulos, E. Dris, et all, Papazisis Publications, 1994.
3. D. Halliday, R. Resnick, K.S. Krane, "Physics", Vol.: II, Translation: G. Pneumatikos, G. Peponidis, Scientific & Technological Publications Pneumatikos G.A., 2009.