COURSE OUTLINE

(1) GENERAL

SCHOOL	PHYSICAL SCIENCES		
ACADEMIC UNIT	PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**214**	**SEMESTER**	**7**
COURSE TITLE	PHYSICAL CHEMISTRY I		

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**
	4	4
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, specialised general knowledge*
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	
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*

Physical Chemistry I provides established methodologies in solving and explaining classic physical chemistry problems and concepts aiming to

- know the properties of solutions (concentrations, colligative properties) and their applications in medicine or desalination
- know energy changes with reactions and their relation to the energy value of fuels
- know the impact of pH and ionic equilibrium in everyday life applications
- know how oxidation number and formal charge concepts influence the real charge of an atom in a compound

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…*
	…….

Stimulation of inductive methodology in solving classic physical chemistry problems (useful for the ASEP exam and for future science teachers working in secondary education)

(3) SYLLABUS

Mole & molecular weight, solutions and concentration, mixing rules. Colligative properties: vapor pressure, boiling/melting point, osmosis. Thermochemistry: enthalpy change of reactions ΔH, calorimetry, Hess law. Chemical equilibrium $K_{C,P}$. Ionic equilibrium-pH, buffer solutions, neutralization reactions, solubility product. Electrochemical potentials of reactions ΔE-relation between ΔE, ΔG-Nernst's equation. Redox reactions

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *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.*	Final writing test at the end of semester (questions and problems solving)

Activity	***Semester workload***
Lectures	39
Tutorials	13
Student's study hours	46
Exam	2
Course total	***100***

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

-General Chemistry, Darell Ebbing & Steven Gammon, Greek translation, Publisher TRAVLOS & SIA OE (2002)

-Chemistry & Chemical Reactivity, Kotz & Purcell, 2nd edition, Saunders College Publishing (1991)

-Problem Solving in Analytical Chemistry, T.P. Hadjiioannou, G.D. Christian, C.E. Efstathiou, D.P. Nikolelis, Pergamon Press (1988)