COURSE OUTLINE

(1) GENERAL

SCHOOL	PHYSICAL SCIENCES		
ACADEMIC UNIT	PHYSICS		
LEVEL OF STUDIES			
COURSE CODE	**54**	**SEMESTER**	**5**
COURSE TITLE	GENERAL CHEMISTRY		

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	5
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)	https://ecourse.uoi.gr/course/view.php?id=2434

(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*

General Chemistry courses have been designed to meet the needs of physics students in our department. They provide basic aspects in the fields of inorganic, organic, physical and nuclear chemistry with emphasis on real life applications in the modern world. At the end of the semester the student will be able to

- apply concepts of physics in chemistry through many working examples
- write and name inorganic compounds and elements
- make stoichiometric calculations
- know basic inorganic reactions and their relation to everyday life chemistry
- know the industrial synthesis of chemicals and metals and their application in everyday life products
- know important air and water technologies pertaining to the production of chemicals and the environment
- make radio dating calculations

- calculate and assess the activity of radioisotopes
- know the applications of radioisotopes
- calculate the energy of nuclear reactions and its significance in the production of nuclear energy
- write and name organic compounds
- relate organic compounds with homologous series through simple organic cascade reactions, develop the ability to propose synthesis schemes of low-to-average complexity
- recognize polymers and their properties
- make thermochemical calculations for fuels and explosives
- predict the molecular geometry of organic compounds and understand its effect on their physical properties
- apply quantum models in organic chemistry to predict and explain the optical properties and stereochemistry of organic compounds
- perform science experiments in class

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…*
	…….

Establish modern chemistry for physicists
Stimulation of creative and critical thinking in chemical science
Relation of chemical science with real life applications

(3) SYLLABUS

Introduction: historical facts, evolution of chemistry, significance of chemistry in the modern world, physics in chemistry. Chemical language & calculations: chemical symbols, nomenclature, introduction to the periodic table of elements, mole & atomic/molecular weights, Avogadro's number, stoichiometry. Basic inorganic chemistry: reactions of metals, ionic reactions, industrial reactions, metallurgy, air & water technologies, radioisotopes & applications, activity of radioisotopes, nuclear energy. Basic organic chemistry: nomenclature, homologous series, petrochemicals, classic organic reactions, polymers, thermochemistry, molecular geometry, quantum models & applications in organic chemistry (particle-in-a-box, Woodward-Hoffmann rules), organic chemistry in everyday life. Experiments demonstration room: demonstration of science experiments (exothermic reactions, energy, microwaves, polymers, advanced materials).

(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*	-Power Point presentation using laptop and projector -Video presentations (YouTube) -Experiment demonstrations in class -Email communication -Ecourse communication
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 (problems solving) -Assigned homework and presentation at the end of semester

Activity	*Semester workload*
Lectures	39
Tutorials/Exercises	13
Student's study hours	30
Exam	3
Course total	***85***

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

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

-Technical Chemistry, Ignatowitz Eckhard, Greek translation, Publisher MARIA PARIKOU & SIA EPE (1997) (EUDOXUS)