COURSE OUTLINE

(1) General information

FACULTY/SCHOOL	TECHNOLOGY			
DEPARTMENT	ENVIRONMENTAL SCIENCES			
LEVEL OF STUDY	*Undergraduate*			
COURSE UNIT CODE	NEW **COURSE**	**SEMESTER**	1th	
COURSE TITLE	INTRODUCTORY CHEMISTRY			
INDEPENDENT TEACHING ACTIVITIES in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits			**WEEKLY TEACHNG HOURS**	**CREDITS**
THEORETICAL BACKGROUND			3	3
LABORATORY PRACTICE			2	2
TOTAL			5	5
COURSE TYPE Background knowledge, Scientific expertise, General Knowledge, Skills Development	BACKGROUND			
PREREQUISITE COURSES:	NO			
LANGUAGE OF INSTRUCTION &EXAMINATION/ASSESSMENT:	GREEK			
THE COURSE IS 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 (certain) level, which students will acquire upon successful completion of the course, are described in detail.
It is necessary to consult:

APPENDIX A

- *Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.*
- *Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and*

APPENDIX B

- *Guidelines for writing Learning Outcomes*

GENERAL CHEMISTRY provides students with the basic background of Chemistry that is necessary for the successful attendance of a series of courses in the Study Program of the Department of Environment. The course aims to introduce students to basic concepts of the atomic structure and the periodicity of their physical and chemical properties, the types of chemical bonds, the speed of chemical reactions and the factors that affect it, as well as the physical state of matter and its relationship with intra-molecular and intermolecular forces. In the basic thermodynamic concepts and the study of

complex compounds, the chemistry of solutions, the redox reactions and the electrochemical behavior of solutions. In the introductory concepts of chemistry, which are considered necessary for a Department of Environment. The laboratory part of the course provides the opportunity to develop laboratory skills and gain laboratory experience and knowledge, necessary for the successful attendance of the courses that follow in the study program of the Department.

The aim of the course is:
1. Students to understand the basic concepts that are developed during the lesson.
2. Students to be able to apply the knowledge gained in the course, in other courses for the next six months, related to Biology, Geology, etc.).
3. Students to meet the requirements of the "Good Laboratory Practices" in subsequent Laboratory courses of the study program of the Department or other undergraduate or postgraduate study programs.
4. Students being able to evaluate, analyze and calculate laboratory measurement data and write laboratory reports.
5. Students to be able to apply the knowledge they will gain during the lesson, so that can solve environmental problems.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research
Project planning and management
Respect for diversity and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical thinking
Development of free, creative and inductive thinking
……
(Other…….citizenship, spiritual freedom, social awareness, altruism etc.)
…….

- Search, analyze and compose data
- Decision making
- Autonomous Work
- Teamwork
- Respect for the natural environment
- Practice criticism and self-criticism
- Promoting free, creative and inductive thinking

(3) COURSE CONTENT

Theory

1. State of matter.
2. Chemical reactions, chemical equations and stoichiometry.
3. Atomic structure. Periodic Table.
4. Chemical bonds atomic and molecular.
5. Atom of C - hybridism.

6. Molecular forces.
7. Oxidation - reduction - Electrochemistry.
8. Chemical thermodynamics.
9. Solutions and colloidal dispersion systems.
10. Chemical kinetics.
11. Chemical equilibrium.
12. Balance of weak bases and acids. Ionization of water. Concept and measurement of pH.
13. Complex compounds.

Laboratory

1. Devices - Materials - Reagents - Laboratory security rules.
2. Laboratory techniques.
3. Analytical scale - Editing results of experimental measurements.
4. Density measurement.
5. Weight analysis.
6. Solutions: preparation and dilution of solutions from concentrated solution and solids.
7. Solution titration - Reaction stoichiometry.
8. Colloidal solutions.
9. Phase separation - Drying of a sample.
10. Chemical kinetics - Reaction rate measurement.
11. Chemical Equilibrium.
12Heat of Reaction.

(4) TEACHING METHODS-ASSESSMENT

<table>
<tr><td>MODES OF DELIVERY
Face-to-face, in-class lecturing, distance teaching and distance learning etc.</td><td>• Lectures in the classroom or by distance
• Experimental work in the lab.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY
Use of ICT in teaching, Laboratory Education, Communication with students</td><td>• Powerpoint.
• e-mail.
• e-class</td></tr>
<tr><td>COURSE DESIGN
Description of teaching techniques, practices and methods:
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.

The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</td><td>
<table>
<tr><th>Activity/Method</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Workshop</td><td>13</td></tr>
<tr><td>Laboratory work</td><td>26</td></tr>
<tr><td>Theory study</td><td>47</td></tr>
<tr><td>Weekly individual evaluation reports for laboratory exercises</td><td>13</td></tr>
<tr><td>Course total
(25 hours of workload per credit unit)</td><td>125</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS
Detailed description of the evaluation procedures:</td><td>I. <u>Appraisal in theory</u>
• Written exams
• Written exams in theory is permitted only after the</td></tr>
</table>

Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc. **Specifically, defined evaluation criteria are stated, as well as if and where they are accessible by the students.**	completion of the laboratory exercises. • The grade participates by 70% in the final grade. II. ***Appraisal in the Lab*** **The appraisal in the lab includes:** • Completion of the laboratory exercises program • Delivery of written report for each laboratory exercise (A) • Written exam (B) **Lab grade: 20% (A) + 80% (B)** **Final grade** **70% Theory grade + 30% Lab grade**

(5) SUGGESTED BIBLIOGRAPHY:

- Suggested bibliography

- ΒΑΣΙΚΗ ΑΝΟΡΓΑΝΗ ΧΗΜΕΙΑ, Ν. Κλούρα, Εκδοτικός οίκος Π. Τραυλός.
- ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΑΝΟΡΓΑΝΗΣ ΧΗΜΕΙΑΣ, Γ. Πνευματικάκης, Χ. Μητσοπούλου, Κ. Μεθενίτης, Εκδόσεις Σταμούλη.
- ΓΕΝΙΚΗ ΧΗΜΕΙΑ-Θεωρία & Εφαρμογές, 2η έκδοση, 2008, ΜΙΧΑΗΛ Ι. ΚΟΝΣΟΛΑΚΗΣ
- ΓΕΝΙΚΗ ΧΗΜΕΙΑ ΤΟΜΟΣ Ι, Ανδρικόπουλος Νικόλαος, 2006.
- ΑΡΧΕΣ ΠΕΡΙΒΑΛΛΟΝΤΙΚΗΣ ΧΗΜΕΙΑΣ, James Girard, 3η Έκδοση, Παρισιανού Ανώνυμη Εκδοτική Εισαγωγική Εμπορική Εταιρία Επιστημονικών Βιβλίων, 2015.
- ΒΑΣΙΚΕΣ ΕΡΓΑΣΤΗΡΙΑΚΕΣ ΓΝΩΣΕΙΣ ΚΑΙ ΤΕΧΝΙΚΕΣ ΑΣΚΗΣΕΩΝ ΓΕΝΙΚΗΣ ΚΑΙ ΑΝΟΡΓΑΝΗΣ ΧΗΜΕΙΑΣ, Βιολέττα Κωνσταντίνου, Χρήστος Παππάς, Εργαστηριακές σημειώσεις, Γεωπονικό Πανεπιστήμιο Αθηνών, 2015.

- Complementary bibliography

Lecture notes and the full material of the lectures and introductory presentations of the workshops, are available through the asynchronous training platform