ETY102 - Chemistry I (Inorganic Chemistry)

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ETY102	**SEMESTER**	1
COURSE TITLE	Chemistry I (Inorganic 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**
Lectures	4	4
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)
COURSE WEBSITE (URL)	http://users.uoi.gr/shadjika/Hadjikakou_1/mathimata/Hadjikakou_08_02_01.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*

- **Learning outcomes:**

The student must be able (ie, expected to be able) to describe, combine, identify and recognize

the basic Concepts and Principles of Chemistry, ie the nomenclature of inorganic compounds, the atom and the molar, the states of matter, atomic structure, periodic table, chemical compounds, mixtures and solutions, thermodynamics, chemical equilibrium, solutions, solubility product and colloids, chemical kinetics, acids and bases and ionic equilibrium.

- **Skills** (ie problem solving, transferring existing knowledge and acquired skills to new situations):

Understanding the simple problems of inorganic chemistry is the prerequisite for further investigation and interpretation of the complex exercises of Engineering and Materials Science. Thus, regarding the ability of *Analysis*, the student must be able (ie, expected to be able) to distinguish the distinct components of the knowledge acquired from this course and to fully understand their organizational structure as taught in the course. Regarding the ability of *Synthesis*, the student must be able (that is, expected to be able) to create, compose, organize but also to propose and revise this knowledge, not only the knowledge itself course, but mainly with the use of data from other courses in the same year, but also to be excellently prepared to do the same in subsequent years but also in internships in older years, and in terms of ability in *Assessment*, the student must be able (i.e., expected to be able) to make evaluative judgments about this knowledge, in the sense of comparing, drawing conclusions, judging, evaluating and their support, especially in the practice of his profession, as a Materials Engineer, when it will require the use of this knowledge.

- **Competences**: (ie combination of understanding and application):

Regarding *Understanding*, the student must be able (ie, expected to be able) to distinguish, explain, evaluate and conclude the value and importance of the above knowledge as necessary basic concepts of Chemistry and the Principles of Chemistry for his introduction to them and especially for the importance of the connection of Chemistry with the subject of Materials Engineering, and regarding the *Application*, the student must (that is, must be able) to be able to use this knowledge beyond the narrow context of this course, and in particular in the context of the challenges he will face in practicing the profession of Materials Engineer, in industry or in research.

The teaching of the course with questions and discussion in the course as well as with assignments given (homework) as well as the evaluation of the students are done in such a way as to satisfy all the above learning outcomes, one by one and in a completely distinct way, ie exactly what the student is expected to be able to do when he / she successfully completes this course, as well as the knowledge he / she will acquire.

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
- Adapting to new situations
- Working independently
- Team work
- Criticism and self-criticism
- Production of free, creative and inductive thinking

(3) SYLLABUS

The course includes theoretical lessons. The course content is concentrated in the following sections:

1. Nomenclature of chemical compounds.
2. Mol
3. States of matter
4. Atomic structure
5. Periodic table of elements
6. Chemical compounds
7. Solutions, solubility product, colloids
8. Thermodynamics
9. Chemical equilibrium
10. Kinetics
11. Acid-bases

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face in the classroom
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT and use videos from sources available in the Internet. The website includes exercises related to each lecture.
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*	

Activity	***Semester workload***
Lectures	26
Exercises which focus on the application of the principles	26
Assignments	22
Unattended study (for exercises preparation etc.)	26
Course total	100

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.*	LANGUAGE OF EVALUATION: Greek METHOD OF EVALUATION: Final exams, related to the understanding of theory, the evaluation of the principles of chemistry, and resolving problems, which use (i) Multiple choice questionnaires (ii) short-answer questions, and (iii) open-ended questions

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

- N. Hadjiliadis, Introduction to General Chemistry (in Greek)
- Darell Ebbing, Steven Gammon, General Chemistry
- P. Karagiannidis, Inorganic Chemistry (in Greek)

-Related Journals:

- Journal of Chemical Education