COURSE OUTLINE

1. GENERAL

SCHOOL	School of Food and Nutritional Sciences		
ACADEMIC UNIT	Department of Food Science and Human Nutrition		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**160**	**SEMESTER**	**A**
COURSE TITLE	GENERAL AND 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 and Practice Exercises	5	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
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	
ACADEMIC STUFF	**Lectures:** Couladouros Elias, Georgiou Constantinos, Pappas Christos, Kokotou Maroula **Practice exercises:** Pappas Christos, Georgiou Constantinos, Couladouros Elias, Kokotou Maroula, Daferera Dimitra, Mihou Anastasia, Bouzas Emmanuel, Kanakis Charalampos

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 AND INORGANIC CHEMISTRY is the basic background course for understanding the principles of structure as well as the reactions of ions and chemical molecules.
The course aims to introduce students to basic concepts of the structure of atoms and the periodicity of their physical and chemical properties. The types of chemical bonds and the shape of the molecules, the rate of the chemical reactions and the factors on which it depends. The physical state of materials and its relation to intramolecular and intermolecular forces. The basic thermodynamic concepts and the study of complex compounds. The chemistry of solutions, the redox reactions and the electrochemical behaviour of the solutions.

The aim of the course is for students to understand the structure of the atoms and materials around us, the types of chemical bonds, the properties of solid, liquid and gaseous state of materials.

Upon successful completion of the course students will be able to:

- Describe the structure of atoms and how molecules and ions are formed
- Predict the stereochemical type of chemical molecules and ions.
- Know the structure and importance of complex compounds.
- Indicate the types of intermolecular forces and how these affect the physical state of materials and their dissolution in various solvents.
- Identify the factors that affect the rate of reactions.
- Know basic thermodynamic concepts and how they are applied to chemical systems.
- Know the chemistry of solutions.
- Know basic redox reactions and the electrochemical behaviour of solutions.

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
- Decision making
- Working independently
- Respect for the natural environment
- Criticism and self-criticism
- Production of free, creative and inductive thinking

3. SYLLABUS

1. The atomic orbital.
2. Periodic Table (atom ion size, ionization energy, electronic affinity, electronegativity, electropositivity, metals, non-metals, semi-metals).
3. Ionic bond.
4. Quantum mechanical view of the covalent bond.
5. Molecular geometry (VSEPR theory, Prediction of molecular geometry based on valence bond theory).
6. Complexes.
7. Intermolecular forces.
8. States of matter.
9. Chemical Thermodynamics.
10. Solutions (solution characteristics, solubility, cumulative properties of solutions, colloids).
11. Chemical kinetics.
12. Ionic balances (acids - bases, pH, indicators, acid-base titrations).
13. Redox - Electrochemical applications.

Laboratory exercises:
1. Safety and work regulation
2. Preparation of a solution of a certain concentration – Dilution of a solution
3. a) Reactions of first-group cations, b) Analysis of a known sample of first-group cations
4. Titration of a strong acid with a standard solution of a strong base – Alkalimetry
5. Complexometric titration – Determination of water hardness
6. Potentiometric titration of a weak acid with a strong base

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures at the amphitheater and practical exercises at the laboratory
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Using PowerPoint presentations. Communication with students via e-mail. Learning process support through e-class access, online databases, etc.
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.*	I. Written final exam in the theory of the course which includes: - Short Answer Questions -Problem solving - Evaluation of theory elements II. Examination in the laboratory part which is formed by: 1. The participation of students in the laboratory: a) oral examination during the exercises (10%) b) evaluation of laboratory reports (10%) c) The average of the analysis results of unknown samples (20%) 2. The average of two (2) written exams (progress) (60%). Students who achieve a grade greater than or equal to five (5) are exempt from the final exam. Otherwise they take the final exam in the laboratory part of the course which includes: - Short answer questions - Multiple choice test

Activity	***Semester workload***
Lectures	50
Laboratory practice	75
Total	**125**

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- CHEMICAL PRINCIPLES: The Quest for Insight, Peter Atkins, Loretta Jones, Leroy Laverman, 7th Edition Publisher: W. H. Freeman, 2016.
- PRINCIPLES OF ENVIRONMENTAL CHEMISTRY, James Girard, 3rd Edition, Parisian Scientific Publishing Company, 2015.
- BASIC LABORATORY KNOWLEDGE AND EXERCISE TECHNIQUES OF GENERAL AND INORGANIC CHEMISTRY, Violetta Konstantinou, Christos Pappas, Laboratory notes, Agricultural University of Athens, 2015.