GENERAL AND INORGANIC CHEMISTRY

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	AGRI 101	**SEMESTER**	1st
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	2	
laboratory exercises	2	
TOTAL	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
PREREQUISITE COURSES:	There are no prerequisite courses.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
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*

By the end of this course the student will be able to:

- understand the structure of atoms and molecules
- understand the position of elements in the Periodic Table and recognize basic physical and chemical properties of the elements
- understand the chemical formulas and the inorganic chemical compound nomenclature and terminology
- recognize the different categories of chemical reactions
- perform stoichiometric calculations
- follow the safety rules of a chemical laboratory as well as the proper handling of the equipment and instruments of a chemical laboratory
- recognize chemical reagents and understand the way they are handled
- prepare solutions and know how to express their concentration
- select appropriate buffer solutions and perform pH calculations
- apply the basic analytical techniques of Chemistry

- evaluate the results of a chemical analysis
- handle instruments

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…*
	…….

By the end of this course the student will, furthermore, have developed the following skills (abilities):

- Ability to identify and designate equipment and instruments of a chemical laboratory
- Ability to record and maintain a correct laboratory diary
- Ability to process experimental measurements and return the results in the correct format
- Ability to find information from any General and Inorganic Chemistry book as well as from Internet sources

Generally by the end of this course the student will have developed the following general abilities (from the above list)

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Respect for the natural environment
Criticism and self-criticism

3. SYLLABUS

• Chemistry and Measurements
• Atoms, Molecules, Ions, Atomic and Molecular Structure, Periodic Table
• Oxidation number, Chemical bond, Chemical formulas and nomenclature of simple chemical compounds
• Solutions, Solubility, Standard Solutions
• pH, Buffers
• Chemical reactions, Chemical equations and stoichiometric calculations
• Acid-base reactions, redox reactions
• Complexation reactions, precipitation reactions
• Qualitative Analysis, Analysis of the most important groups of cations and anions
• Quantitative analysis, Classification of methods of classical and instrumental quantitative analysis, Gravimetric analysis, Titration
• Chromatography
• Electrochemical methods of analysis-Potentiometry
• Optical methods of analysis - Ultraviolet-visible absorption spectrophotometry, Infrared spectrophotometry, Emission spectrophotometry, Atomic absorption

<u>Laboratory Exercises</u>

- Introduction to the Laboratory - Safety and health rules
- Chemical Laboratory Equipment and Instruments, Chemical Reagents
- Experimental uncertainty, significant digits
- Expressions of solution concentration and dilution

- Precipitation reactions
- Chemical properties of metals and non-metals
- pH determination - Buffer solutions
- Oxymetry-Alkalimetry

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face lectures and laboratory exercises.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. • Use of ICTs in student communication (learning support through the e-class platform).
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 Laboratory practice: 26 Writing lab reports: 13 Private study time of the students for the lab preparation and final examination - Participation in the examinations: 60 **Course total (25 work load for each ECTS credit): 125**
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.*	1. Laboratory work (Average score of individual reports of laboratory exercises) (A) 2. Written final examination (B) *Each case is graded on a scale of 0-10* Final grade (FG): FG = 0.3A + 0.7B *Minimum passing grade: 5 (Grade: 0-10)* 3. All the above are taking place in Greek.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. R. Chang, J. Overby, 2021, Chemistry
1. D. D. Ebbing, S. D. Gammon, 2017. General Chemistry
2. D. A. Skoog, F. James Holler, T. A. Nieman, 1997. Principles of Instrumental Analysis

- Related academic sources and journals:

- Journal of Chemical Education (ACS Publications) http://pubs.acs.org/journal/jceda8