ANALYTICAL CHEMISTRY

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	**165**	**SEMESTER**	**B**
COURSE TITLE	ANALYTICAL 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)	https://w1.aua.gr/etda/en/courses/analytical-chemistry/		

(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*

Analytical chemistry using the principles of chemical equilibrium, physics and statistics acquaints students with the science of measurements in chemistry. This is achieved by teaching in the amphitheater and the laboratory.

The principles of measurement science are presented in different techniques while the importance of pre-treatment of samples is pointed out. Laboratory training acquaints students while the processing of experimental data is of particular importance for preparing for work in industry, production or research.

The course is taught in the early stages of studies and brings students in contact with the processes

of searching and writing reports on food science.

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…*
	…….

- Autonomous Work
- Decision making
- Production of new research ideas
- Production of free, creative and inductive thinking

(3) SYLLABUS

Lectures

1. Introduction - Data processing
2. Chemistry
3. Volumetric measurements
4. Potentiometry
5. Voltammetry
6. Ammeter & ammeter sensors - Coulometry
7. Introduction to spectroscopic techniques
8. Molecular fluorometry
9. Chemistry & bioluminescence - Nephelometry & Turbidimetry
10. Atomic spectroscopy
11. Inductively coupled plasma mass spectrometry
12. Automation
13. Kinetic techniques
14. Immunochemical techniques

Laboratory Exercises

1. Spectrophotometric Determination of Iron, Fe(II)
2. Simultaneous Spectrophotometric Determination of Chromium(VI) and Manganese (VII)
3. Enzymatic-Kinetic Determination of Glucose by GOX-PAP method
4. Determination of Magnesium by Atomic Absorption Spectroscopy
5. Fluoride Determination with a Fluoride Selective Electrode
6. Conductivity

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Lectures in the amphitheater and laboratory exercises in the laboratory.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Using PowerPoint presentations. Communication with students via e-mail. Learning process support through e-class access, online databases, etc.</td></tr>
<tr><td>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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>40</td></tr>
<tr><td>Laboratory practice</td><td>30</td></tr>
<tr><td>Reports Individual laboratory work (results report)</td><td>35</td></tr>
<tr><td>Written individual work</td><td>20</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>125</td></tr>
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<tr><td>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.</td><td>I. Evaluation of the comprehension of the lectures with the final examination
II. The short examination before each laboratory exercise and the evaluation of the results / report after its completion contribute equally to the score of each laboratory exercise. In case the student does not get an average grade of more than 50%, he / she is referred to final exams.</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

1. Fundamentals of Analytical Chemistry. D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch
2. Principles of Instrumental Analysis. D. A. Skoog, F. James Holler, T. A. Nieman. Translated by Karagiannis, Efstathiou, Haniotaki
3. Errors & Data treatment, Problems & laboratory manual. C.A. Georgiou, Analytical Chemistry Course Notes