COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**204Y**	SEMESTER	**2**
COURSE TITLE	**Laboratory course in 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	1	
Laboratory exercises	3	
Total	**4**	**4**
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	No
COURSE WEBSITE (URL)	https://www.env.aegean.gr/all_courses/laboratory-course-in-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*

- Knowledge of laboratory safety rules and use of laboratory's glassware, reagents and equipment.
- Understanding measurements and errors theory
- Performing chemical analyses (titrations) including planning, implementation and reporting

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
Adapting to new situations
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment

Decision-making *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently

(3) SYLLABUS

- Safety rules in the Chemical Laboratory
- Experimental errors – calibration of Laboratory equipment
- Solutions-ways of expressing concentration -Law of dilution-Volumetric analysis
- Neutralization, Alkalimetry – Acidimetry,
- Back Titration
- Gravimetric analysis
- Redox titration
- Iodimetric titration
- Manganate titration

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Laboratory education
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	13
Laboratory practice	39
Study	60
Total	**112**

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 • Weekly report of the laboratory exercises (50%) • Final examination (50%)

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Lecture notes: Description/presentation of weekly laboratory exercises
- Αναλυτική Χημεία, Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug, 2019, Odysseus Publishing Ltd
- Γενική χημεία και ενόργανη ανάλυση, Λυδάκης – Σημαντήρης Νίκος, 2009, Εκδόσεις Τζιόλα
- Standard Methods for the Examination of Water and Wastewater (twenty-first ed.), American Public Health Association, USA (2005)
- Miroslav Radojevic, Vladimir Bashkin (1999), Practical Environmental Analysis, he Royal Society of Chemistry