COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
DEPARTMENT	DEPARTMENT OF CHEMISTRY		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	PEDN701	**SEMESTER**	7th Semester
COURSE TITLE	Didactic of Chemistry		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures	3	6
Tutorial sessions	2	
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	General Background
PREREQUISITES:	
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass2.emt.duth.gr/courses/CHEM_E107/

(2) LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Specific Course Learning Outcomes

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

- Understand the methods and working tools of Didactics of Chemistry, along with topics stemming from the Nature of Chemistry, student characteristics, and the social and cultural environment.
- Know the basic ways of didactic transformation of scientific knowledge, thinking, and scientific practices into teaching subjects.
- Correlate developments in sciences with changes in Chemistry curricula, teaching approaches, and the educational material used.

General Competences

- Search, analysis, and synthesis of data and information, using the necessary technologies.
- Adaptation to new situations.
- Autonomous Work.
- Teamwork.
- Promotion of free, creative, and inductive thinking.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,	*Project design and management*
ICT Use	*Equity and Inclusion*
Adaptation to new situations	*Respect for the natural environment*
Decision making	*Sustainability*

Autonomous work *Teamwork* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Demonstration of social, professional and moral responsibility and sensitivity to gender issues* *Critical thinking* *Promoting free, creative and inductive reasoning*

Upon completion of this course, the student will have further developed the following general skills:

- *Search, analysis and synthesis of data and information, ICT Use.*
- *Adaptation to new situations.*
- *Autonomous work.*
- *Teamwork.*
- *Production of new research ideas.*

(3) COURSE CONTENT

Week 1: Introduction to Didactics of Chemistry (Field development, influence of History of Chemistry, language of Chemistry).
Week 2: The Nature of Chemistry and Chemical Education (Popularization of Chemistry, importance of chemical concepts).
Week 3: Theories of Science Didactics (Nature of scientific concepts, inquiry-based method, modeling, experimental approach).
Week 4: Didactic transformation (Theoretical background, applications for students and teachers).
Week 5: Chemistry as a cognitive subject (History of Chemistry, Johnstone's three levels of Chemistry).
Week 6: Didactic approaches in Chemistry (part 1: Curricula, textbooks, application of learning theories).
Week 7: Didactic approaches in Chemistry (part 2: Analogies, concept maps, inquiry-based approach, teaching evaluation).
Week 8: The school laboratory as a learning environment (Organization, types of exercises, learning value of experiments).
Week 9: The experiment is a method of understanding (Applications in Secondary Education, computer molecular visualization).
Week 10: Educational material in Chemistry (Printed and digital material, chemical representations, use of ICT).
Week 11: Research in Didactics of Chemistry (Research areas, relation to educational practice, ethical issues).
Week 12: Common errors in Chemistry teaching (Problems of understanding, didactic strategies for problem-solving).
Week 13: Education for the environment and sustainable development (Environmental education, relations with chemical education).

(4) LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to face (In-class teaching, discussion, cooperative learning).
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of ICT in Teaching Use of ICT in Communication with students
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.*	

Activity	Workload/semester
Lectures	39
Tutorial sessions	26
Interactive teaching	10
Writing assignments	10

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.		
	Study and analysis of bibliography	10
	Final exam	2
	Continuous assessment	1
	Student self-study	52
	Total workload for the course	150
STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	**Student evaluation languages** Greek **Method (Formative or Concluding)** Summative **Student evaluation methods** The final assessment consists of a written examination with multiple-choice or short-answer questions in the Greek language. Sample questions are provided during the last lesson of the semester. The final grade is calculated as follows: 30% × assignment grade 20% × progress / continuous assessment grade 50% × final examination grade Participation in the final examination is mandatory for all students for a grade to be officially recorded. The written individual or group assignment (up to 5 students per group) is optional and is thoroughly prepared during the course sessions. **Rate** **100**	

(5) SUGGESTED BIBLIOGRAPHY

1. Altunata, S. (2001). Chemistry and humanity: Challenges our profession faces as we advance towards the third millennium. HYLE – International Journal for Philosophy of Chemistry, 7(1), 51–60.
2. Bloor, D. (2005). Toward a sociology of epistemic things. Perspectives on Science, 13(3), 285–312.
3. Laszlo, P. (2011). Towards teaching chemistry as a language. Science & Education.
4. Σκορδούλης, Κ. (Επιμ.). (2008). Ζητήματα θεωρίας των επιστημών της φύσης. Αθήνα: Τόπος.
5. Σκορδούλης, Κ., & Σωτηράκου, Μ. (2005). Περιβάλλον, επιστήμη και εκπαίδευση. Αθήνα: Leader Books.