

COURSE OUTLINE

(1) GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	BIOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BIO_AY07	SEMESTER	2
COURSE TITLE	ORGANIC CHEMISTRY		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures, seminars and laboratory work		6 (3 lect. + 1 sem. + 1 lab.)	6
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	General knowledge. Field of Science (Organic Chemistry) and Skills Development (Experimental Organic Chemistry)		
PREREQUISITE COURSES:	There are not prerequisite course.		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek.		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CHEM2016/ https://eclass.upatras.gr/courses/CHEM2070/		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>At the end of this course the student should be familiar with the nomenclature and the Chemistry of the following classes of Organic Compounds: Hydrocarbons, alkyl halides, alcohols, ethers, sulfur compounds, amines, aldehydes and ketones, carboxylic acids and their derivatives, heterocyclic compounds. It will be able to recognize and plan with the right stereochemistry amino acids, peptides, proteins, simple sugars, disaccharides, polysaccharides, lipids, nucleotides and nucleic acids. At the end of the lab, the student will be able to organize and execute syntheses of simple organic molecules and edit and present the results.</p>

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...

At the end of this course the student will have developed the following skills:

1. Ability to understand the essential data, concepts and theories related to Organic Chemistry.
2. Ability to apply this knowledge to concepts of Biochemistry and Molecular Biology.
3. Ability to understand the essential concepts, principles and techniques related to the synthesis and purification of simple organic compounds and their application

(3) SYLLABUS

Organic Chemistry (Theory)

Families of organic compounds, functional groups and nomenclature.

Atomic structures of the carbon, hydrogen, oxygen, sulfur and nitrogen atoms.

Chemical bonds and molecular structure. Stereochemistry.

Inductive effect and resonance.

Types of reagents, reactions and mechanisms.

Hydrocarbons.

Alkyl halides.

Alcohols.

Ethers.

Sulfur compounds.

Amines.

Aldehydes and ketones.

Carboxylic acids and derivatives.

Heterocyclic compounds.

Carbohydrates.

Amino acids and proteins.

Nucleotides and nucleic acids.

Lipids.

Experimental Organic Chemistry

1. Separation and purification methods of organic compounds:
 - a. Filtration - recrystallization,
 - b. Extraction,
 - c. Distillation,
 - d. Thin layer chromatography.
2. Application to the synthesis of benzoic acid and benzylic alcohol from benzaldehyde (Cannizzaro).

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Lectures, seminars and laboratory work face to face.	
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. The lectures content of the course for each chapter are uploaded on the internet, in the form of a series of ppt and pdf files, where from the students can freely download them using a password.	
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</i></p> <p><i>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</i></p>	Activity	Semester workload
	Lectures (3 conduct hours per week x 13 weeks)	39
	Seminars (1 conduct hour per week x 10 weeks) - solving of representative problems	10
	Laboratory work (4 conduct hours per week x 3 weeks)	12
	Final examination (3 conduct hours)	3
	Hours for private study of the student and preparation for the final examination	86
Course total	150	
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Written examination in Greek after the end of the semester.</p> <p>Minimum passing grade: 5.</p>	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. J. McMurry, "Organic Chemistry", Απόδ. στα ελληνικά: Α. Βάρβογλης, Μ. Ορφανόπουλος, Ι. Σμόκου, κ.ά., Πανεπιστημιακές Εκδόσεις Κρήτης, 2012.

2. L. G. Wade, Jr., "Organic Chemistry", Απόδ. στα ελληνικά: Δ. Κομιώτης, κ.ά., Εκδόσεις Α. Τζιόλα και Υιοί ΟΕ, 2010.
3. J. Clayden, N. Greeves, S. Warren, P. Wothers, "Organic Chemistry", Oxford University Press, Oxford, 2001.
4. David Klein, "Οργανική Χημεία για τις Επιστήμες της Ζωής", Μετάφραση επιμέλεια Γ. Κόκοτος, κλπ, Εκδόσεις Utopia publishing, 2015.
5. Σπυλιόπουλος Ι., "ΒΑΣΙΚΗ ΟΡΓΑΝΙΚΗ ΧΗΜΕΙΑ", Εκδόσεις Σταμούλης, 2008.
6. Βάρβογλης Α., "ΕΠΙΤΟΜΗ ΟΡΓΑΝΙΚΗ ΧΗΜΕΙΑ", Εκδόσεις Ζήτη, 2005.

Notes of lecturer in Greek.

- Related academic journals: