COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Agricultural Sciences		
ACADEMIC UNIT	Biosystems & Agricultural Engineering		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**BAE_220**	**SEMESTER**	**2nd**
COURSE TITLE	**ORGANIC 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	3	
Tutorials	0	
Laboratory	2	
TOTAL	**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*	Background
PREREQUISITE COURSES:	There are no strict prerequisites but students must have been taught General and Inorganic Chemistry and General Biology and have successfully completed the respective workshops..
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek .-For Erasmus students in English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
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*

The student, at the end of the relevant Learning Process, is able to:

• understands the chemical formulas and nomenclature of organic chemical compounds
• knows the main classes of organic compounds and their basic reactions
• explains the structure, stability and activity of aromatic compounds using the theory of resonance
• knows the chemical composition and structure of basic biomolecules (carbohydrates, proteins, lipids, nucleic acids)
• knows the basic laboratory techniques of Organic Chemistry

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 *Project planning and management*

information, with the use of the necessary technology	*Respect for difference and multiculturalism*
Adapting to new situations	*Respect for the natural environment*
Decision-making	*Showing social, professional and ethical responsibility and*
Working independently	*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 further developed the following skills (general skills):

• Ability to demonstrate knowledge and understanding of concepts and applications related to Organic Chemistry
• Ability to demonstrate knowledge and understanding of concepts and applications related to the structure of biomolecules
• Study skills needed for continuing professional development.
• Ability to interact with others on problems of a chemical or interdisciplinary nature.

In general, upon completion of this course the student will have further developed the following general skills (from the list above):

Search, analysis and synthesis of data and information, using the necessary technologies
Adaptation to new situations, Decision making, Autonomous and team work,
Respect for the natural environment, Exercise criticism and self-criticism

(3) SYLLABUS

1. Introduction to Organic Chemistry and Organic Compounds
2. Classification and Nomenclature of Organic Compounds
3. Hybridization in Organic Compounds
4. Isomerism and Stereochemistry
5. Organic Reaction Mechanisms
6. Aliphatic Hydrocarbons
7. Alkyl halides
8. Alcohols, Aldehydes, Ketones and derivatives of carbonyl compounds
9. Carboxylic Acids and Derivatives
10. Isoprenoid compounds
11. Coordination-Marital phenomenon, Aromatic compounds and derivatives
12. Biomolecules: Carbohydrates, Sugars, Lipids, Amino Acids, Peptides and Proteins
13. Biomolecules: Nucleotides and Nucleic Acids Heterocyclic compounds of plant and animal origin

Laboratory Exercises

1. Introduction to the Laboratory-Safety and hygiene rules
2. Basic Laboratory Techniques
3. Recrystallization, Melting point
4. Thin layer chromatography (T.L.C.)
5. Hydrocarbon reactions
6. Alcohol reactions
7. Detection of carbonyl groups
8. Detection and properties of amino acids
9. Physicochemical properties of proteins
10. Spectrophotometry-Quantification of proteins
11. Properties of mono- and disaccharides
12. Detection of carbohydrates
13. Determination of pI of glycine

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face to face deliveries.
Laboratory exercises in Organic Chemistry</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Use of ICT (power point) in Teaching
• Use of ICT (power point) in Laboratory Training
• Use of ICT in Communication with students (Learning process support through the electronic platform e-class).</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>39</td></tr>
<tr><td>Laboratory</td><td>26</td></tr>
<tr><td>Writing short reports of laboratory exercises</td><td>13</td></tr>
<tr><td>Final Exams</td><td>3</td></tr>
<tr><td>Study hours and preparation for the laboratory exercises and the final examination</td><td>44</td></tr>
<tr><td>Course total</td><td>125</td></tr>
</table>
</td></tr>
<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>1. The laboratories participate by 30% in the final grade. In order to be examined in theory, the student must have completed all the laboratories and have been successfully examined in them.
2. The main assessment criteria focus on understanding and correlating the knowledge that students gain from the course with other knowledge. Particular emphasis is placed on whether they have developed the ability to apply this knowledge to crop selection and to assess the impact of these changes on the environment. Emphasis is also placed on demonstrating critical ability and justifying the choices they make in each problem.
3. Evaluation is dynamic. It mainly involves problem solving. is done orally or in writing or with a combination of the two, with or without pre-examination on the basic principles of the course, with or without exculpatory advances and with other test or inventive methods, depending on the composition of the dynamics and the needs of the audience.
4. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography :

1. J. McMurry, 2017, Οργανική Χημεία, Πανεπιστημιακές Εκδόσεις Κρήτης

2. Νικόλαος Ανδρικόπουλος, 2019, Συνοπτική Γενική & Ειδική Οργανική Χημεία

3. Μαυρομούστακος Θωμάς, Τσέλιος Θεόδωρος, Παπακωνσταντίνου Κωνσταντίνος, 2014, Θεμελιώδεις Αρχές Οργανικής Χημείας, Εκδόσεις ΣΥΜΜΕΤΡΙΑ

4. Carret/Denniston/Topping, 2000, Αρχές και Εφαρμογές της Ανοργάνου , Οργανικής και Βιολογικής Χημείας, Εκδόσεις BROKEN HILL

5.Βασική Οργανική Χημεία, Σπηλιόπουλος Ιωακείμ, 1η Έκδοση, 2008, Εκδόσεις Σταμούλη Α.Ε.

6. Οργανική Χημεία L. G. Wade, JR., 7η Έκδοση, Εκδόσεις Τζιόλα

7.Επίτομη Οργανική Χημεία, Βάρβογλης Αναστάσιος Γ., 1η Έκδοση 2005, Εκδόσεις Ζήτη Πελαγία & Σια Ι.Κ.Ε.

-Other sources

- *The Journal of Organic Chemistry, (ACS Publications) https://pubs.acs.org/journal/joceah*
- *Biochemistry, (ACS Publications) https://pubs.acs.org/journal/bichaw*
- *https://www.organic-chemistry.org/*
- *https://en.wikiversity.org/wiki/Portal:Organic_chemistry*
- *https://www.khanacademy.org/science/organic-chemistry/stereochemistry-topic*\