



UNIVERSITY OF NICOSIA

ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

Course Code PHAR-151	Course Title Organic chemistry/Οργανική Χημεία	Credits (ECTS) 6
Department Life & Health Sciences	Semester Spring	Prerequisites None
Type of Course Required	Field Pharmacy	Language of Instruction Greek/English
Level of Course 1 st Cycle	Year of Study 1 st year	Lecturer Zoi Konsoula/Charis Kalyvas
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The objective of the course is for students to develop an understanding and appreciation of both structure and chemical transformations of organic molecules. More specifically:

- Understanding the central role of organic chemistry in the structural characterization of molecules.
- Detailed examination of the basic principles of modern organic chemistry and understanding its impact on the function and the reactivity of molecules as well as on the interactions between molecules.
- Study the physical and chemical properties of the main classes of organic molecules.
- Development of the ability to predict molecular reactivity based on the structure of the molecules.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Classify organic compounds and represent them appropriately using line structures.
- Describe the chemistry of the main classes of organic molecules and have a sound knowledge of the chemistry of alkanes, alkyl halides, alkenes, and alkynes, alcohols, ethers, phenols, aromatic rings, ketones, aldehydes, amines, carboxylic acids, and their derivatives.
- Describe the mechanisms of organic reactions and predict the reactivity patterns.

- Evaluate information regarding structure and reactivity of molecules.
- Explain the structures (hybridization, geometry, and polarity) and compare physical properties (boiling point, melting point, solubility, conformations, and stability) of organic compounds.
- Use the rules of nomenclature to give correct names for organic compounds, draw correct structures that correspond to a name, and correctly use and recognize common names.
- Use principles of stereochemistry to locate stereocenters and label stereoisomers, identify chiral compounds, give stereochemical relationships between molecules, use Fischer projections, solve optical activity problems, and identify stereochemical results of a reaction.
- Use mechanistic principles to recognize nucleophiles and electrophiles, acids, and bases, and correctly draw the mechanisms of selected reactions; also use mechanisms to predict the regio- and stereoselectivity of products.
- Predict acidity or basicity of organic compounds based on their structure and chemical characteristics.
- Perform simple laboratory syntheses and execute experiments for the determination of several compounds.

Course Contents:

- 1. The nature of organic molecules:** Alkanes and cycloalkanes.
- 2. Nomenclature of organic compounds.**
- 3. Stereochemistry:** Alkanes, cycloalkanes, alkenes and biological molecules.
- 4. Alkenes:** Structure, function, reactions and synthesis.
- 5. Alkynes:** Structure, function, reactions and synthesis.
- 6. Alkylhalides:** Reactions (nucleophilic substitution and elimination).
- 7. Conjugation and aromaticity:** Conjugation and resonance, Benzene, aromaticity, electrophilic aromatic substitution.
- 8. Alcohols, thiols, phenols and ethers:** Structure, function, reactions and synthesis.
- 9. Aldehydes and Ketones:** Synthesis, properties, nucleophilic addition reactions, α -substitution reactions and carbonyl condensation reactions.
- 10. Carboxylic acids and their derivatives:** Structure, acidity, reactions and synthesis.
- 11. Aliphatic and aromatic amines:** Structure, basicity, reactions and synthesis.

Laboratory Experiments:

Laboratory 1: Nucleophilic substitution reactions.

Laboratory 2: Isolation of salicylic acid from a mixture.

Laboratory 3: Differentiation reactions of aldehydes and ketones.

Laboratory 4: Synthesis of 1,5-diphenyl-1,4-pentadien-3-one via aldolic condensation.

Laboratory 5: Saponification.

Laboratory 6: Distillation and crystallization.

Learning Activities and Teaching Methods:

Lectures, class discussion, assignments, laboratory and laboratory reports

Assessment Methods:

Final examination, course work

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
JohnMcMurry	Organic Chemistry	Brooks-Cole	2012	9780840054531
JohnMcMurry Μετάφραση: Α. Βάρβογλης, Μ. Ορφανόπουλος, Ι. Σμόνου, Μ. Στρατάκης	Οργανική Χημεία	ΠΑΝΕΠΙΣΤΗΜΙΑΚ ΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ	2012	9789605240547
Reinhard Bruckner	Advanced Organic Chemistry: Reaction Mechanisms	In Advanced Organic Chemistry Series. San Diego: Harcourt/Academic Press	2002	9780121381103

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Carey F.A	Organic Chemistry	McGraw Hill	2000	0072905018
Housecroft C.E & Constable E.C.	Chemistry	Pearson Prentice Hall	2006	0131275674

