

CLASSES OF ORGANIC COMPOUNDS (SPECIFIC ISSUES IN ORGANIC CHEMISTRY)

Code number: NP18-27

Cycle:

Undergraduate

Semester:

4th semester

Course type

X	Background/General knowledge
	Scientific area (pharmacy)

Credit Units (ECTS): 7

Lectures (hours/week): 4

Tutorial (hours/week): 1

Laboratory work (hours/week): 2

Course coordinator: Konstantina Fylaktakidou, Professor

Tutor (s):

Konstantina Fylaktakidou, Professor

Communication: Tel. : 2310-997844, e-mail (kfylakta@chem.auth.gr)

Ioannis Lykakis, Assoc. Professor

Communication: Tel. : 2310-997871, e-mail (lykakis@chem.auth.gr)

Stergiani Ordoudi, Scient. Assist. Personel.

Communication: Tel. : 2310-997847, e-mail (steord@chem.auth.gr)

Aims of the course:

This course aims to make the students familiar to the basic principles of Specific classes of Organic Compounds. The obtained knowledge will be helpful in the understanding of the courses of Pharmaceutical Chemistry in the following semesters, as well in the understanding of the function and activity of the biomolecules and their interaction to other simple molecules. With this knowledge they could be helped to solve basic problems of organic chemistry as professionals in the field of drug's synthesis in the Pharmaceutical industry.

During the course the following are presented and explained in summary:

Spectroscopy of Organic Compounds,

Fundamentals of classes of organic compounds (the chemistry of aromatic compounds, the chemistry of all carbonyl containing compounds and their surrounding atoms, the chemistry of amines, the chemistry of biomolecules).

Skills:

By the end of this course, the students should be able to know and understand:

- The principles of Spectroscopy in Organic Chemistry
- The properties of aromatic compounds, the meaning of aromaticity, anti-aromaticity, non-aromaticity and their consequences to the chemical systems
- The principles of substrate's guided aromatic substitution
- The fundamental properties of a carbonyl group and the consequences to the surrounding atoms and visa-versa
- The reactivity of a carbonyl as a function of its surrounding atoms
- The fundamental properties of all classes of biomolecules

The students should be able to combine the knowledge in the above classes of organic compounds, understand advanced synthetic schemes and solve more complicated problems

Teaching methods: Lectures

Contents of the course: Interpretation of the fundamental properties of the major classes of organic compounds, a subject divided in the following chapters:

Tutors:

1) Ioannis Lykakis

Basic concepts of organic spectroscopy. IR, MS, NMR, UV-Vis spectra

Conjugate π -systems and pericyclic reactions

Aromatic compounds

Aromatic substitution reactions

2) Konstantina Fylaktakidou

Aldehydes and ketones

Carboxylic acids and their derivatives

α -carbon chemistry. Enols and enolates

Amines

Chemistry of Biomolecules (carbohydrates)

Chemistry of Biomolecules (amino acids, peptides, proteins)

Chemistry of Biomolecules (lipids, nucleic acids)

3) Stergiani Ordoudi, Konstantina Fylaktakidou

Safety rules in the chemical laboratory.

Learning the basic techniques of the organic laboratory (recrystallization, distillation, extraction, drying, chromatography, m.p. and b.p. reflux).

Conduct simple organic synthesis reactions.

Proposed literature: The following books are translations in Greek of books written in English. A student may also find the English version in the market or in the library

1. David Klein, «ORGANIC CHEMISTRY», Volume B', Publisher: Utopia
2. John McMurry, «ORGANIC CHEMISTRY», Publications of Crete University
3. K. Peter C. Volhardt, Neil E. Schore, «ORGANIC CHEMISTRY », Publisher: Kyriakidis

Educational activities: Lectures, tutorials, discussion with the students in every session, practical courses.

Evaluation process and methods: Examination is performed at the end of the semester. To compute the final grade, the grade which is given by each tutor (5.00) is added.

The duration of the examination is 3 hours for the two tutors.

The examination at the end of the semester is performed at dates, time and place arranged by the department.

Use of TIC / Electronic distribution of the lectures

Lectures, notes, statements etc are presented in the corresponding place of the website of the tutors and the course.

Teaching: Teaching of this course is accomplished through lectures and practicals

Lecture	Title	Tutor
1	Basic concepts of organic spectroscopy. IR, MS	Lykakis I.
2	Basic concepts of organic spectroscopy. NMR, UV-Vis spectra	Lykakis I.
3	Conjugate π -systems and circular reactions	Lykakis I.

4	Aromatic compounds	Lykakis I.
5	Aromatic substitution reactions	Lykakis I.
6	Aldehydes and ketones	Fylaktakidou, K
7	Carboxylic acids and their derivatives	Fylaktakidou, K
8	α -carbon chemistry. Enols and enolates	Fylaktakidou, K
9	Amines	Fylaktakidou, K
10	Chemistry of Biomolecules (carbohydrates)	Fylaktakidou, K
11	Chemistry of Biomolecules (amino acids, peptides, proteins)	Fylaktakidou, K
12	Chemistry of Biomolecules (lipids, nucleic acids)	Fylaktakidou, K
13	Revision of the organic reactions via advanced exercise examples	Fylaktakidou, K, Lykakis, I

A) **Lectures.** Lectures (13 of 5 hours-Lectures and Tutorials) are given in the lecture room A (old Chemistry Building)

B) Laboratory work: **Stergiani Ordoudi, Konstantina Fylaktakidou**

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