ORGANIC CHEMISTRY I

Academic year 2024/2025 - summer semester

LECTURES

Teaching activity: 2 hours per week

Lecturer**:** **Assoc. prof. PharmDr. Jindra Valentová, PhD.**

1. Organic chemistry – system and nomenclature. Nomenclature of hydrocarbons
2. Nomenclature of heterocyclic compounds
3. Nomenclature of derivatives
4. Covalent bonding in organic compounds. Stereochemistry of the C_{sp^3} bonds
5. Stereochemistry of the C_{sp^2} bonds and cyclic compounds
6. Chirality. Optical activity.
7. Inductive and resonance effects
8. Conjugate double bonds. Aromaticity. Tautomers
9. Acidity of organic compounds
10. Basicity of organic compounds
11. Classification of organic reactions. Basic classification. Reactive intermediates of organic reactions (ions, free radicals, carbens, dehydrobenzene)
12. Substitution reactions: free-radical substitution reactions, nucleophilic substitution reactions, electrophilic substitution reactions
13. Addition reaction: Electrophilic addition reaction, Nucleophilic addition reaction, Eliminations, Molecular rearrangement

RECOMMENDED LITERATURE:

Devínsky F. et al. *Organic chemistry for pharmacy students*, Comenius University, 2010.
McMurry J. E. Organic Chemistry, *Kindle Edition 2015*

Bratislava, 5th of February 2025

assoc. prof. Ing. Martin Pisárčik, CSc.
Head of Department

ORGANIC CHEMISTRY I

Academic year 2024/2025 - summer semester

SEMINARS

Seminar lecturers: **Assoc. prof. PharmDr. Jindra Valentová, PhD., RNDr. Roman Mikláš, PhD.**

1. Organic chemistry – system and nomenclature. Nomenclature of hydrocarbons
2. Nomenclature of heterocyclic compounds
3. Nomenclature of derivatives
4. *Test 1 (20 pts)*

   Covalent bonding in organic compounds. Stereochemistry of the C_{sp^3} bonds
5. Stereochemistry of the C_{sp^2} bonds and cyclic compounds
6. Chirality. Optical activity of organic compounds
7. *Test 2 (20 pts)*

   Inductive and resonance effects
8. Conjugate double bonds. Aromaticity. Tautomerism.
9. Acidity of organic compounds
10. Basicity of organic compounds
11. *Review test (30 pts)*

    Classification of organic reactions. Basic classification. Reactive intermediates of organic reactions (ions, free radicals, carbens, dehydrobenzene)
12. Substitution reactions: free-radical substitution reactions, nucleophilic substitution reactions, electrophilic substitution reactions
13. Addition reaction: Electrophilic addition reaction to multiple bonds carbon – carbon, Nucleophilic addition reaction to activated multiple bonds (C=O, C=N), Eliminations, Molecular rearrangement

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PROGRAM OF LABORATORY PRACTICES

Laboratory practices are planned for the first 6 weeks of the semester in a block of sessions according the schedule.

Laboratory teachers: **Mgr. Lucia Lintnerová, PhD., doc. Ing. Martin Pisárčik, CSc.**

1. General safety consideration.
   Soxhlet extraction of benzoin from ethanol.
   Recrystallization from ethanol.
   Determination of melting point.

2. Steam distillation of aniline.
   Vacuum distillation of aniline.
   Determination of refractive index.

3. Synthesis of dibenzalacetone and crystallization of the product from ethanol.
   Determination of melting point.
   Spectroscopic methods I (UV, IR) and interpretation of spectra.

4. Synthesis of acetylsalicylic acid (aspirin) and crystallization of the final product.
   TLC chromatography.
   Spectroscopic methods II (^{1}H, ^{13}C-NMR) and interpretation of spectra.

5. Synthesis of paracetamol and crystallization of the final product.
   Synthesis of acetanilide and crystallization of the final product.
   Laboratory final test (20 pts).

6. Substitution of missing laboratories.

RECOMMENDED LITERATURE

N. Miklášová, L. Habala L. Lintnerová: Laboratory Techniques and Syntheses in Organic Chemistry, first edition, **2022** (link to the text book)

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ORGANIC CHEMISTRY I

Academic year 2024/2025 - summer semester

Basic requirements to complete lectures, seminars, laboratory practices and allowance to the exam of Organic Chemistry I

LECTURES

Students must attend all the lectures in Organic Chemistry I (100% attendance). In the case of absences, the student is allowed to substitute a maximum of **three lectures** accepted by the lecturer. If the absences have no justification, the student will be not allowed to the exam.

PRACTICES AND SEMINARS

Students must attend all laboratory practices and seminars in Organic Chemistry 1 (100% attendance). Substitution of laboratory practices and seminars is decided by the head of the department and the lecturer of the subject. Students can substitute only 20% of tuition.
The sum of the **seminar's tests** (every 20 pts) and the review test (30 pts) must be more than **60%**, otherwise, the student is not allowed to apply for the final exam.
The evaluation of laboratory practices is made by rating the practical **reports** (every 5 pts) and by a final **laboratory test** (20 pts), which can be written **ONLY ONCE**!!! The overall score of the laboratory practices must be over **60%** to receive the allowance for the final exam.
The results of the seminar's tests and laboratory practices are included in the exam. Points are multiplied by **0.3** factors in the case of seminars and **0.1** in the case of laboratory practices.
Students who acquire **less than 60%** can apply for a **pre-exam test**. The pre-exam test can be written **only once,** and the student must acquire more than 60% of the points. Students may apply for a pre-exam using AIS2.
There is a possibility to consult lectures during their consultation hours. The consultations are provided strictly during the semester! They are not performed during the examination period!

EXAMS

The exams will be performed only in stated timetable from 26th of May until 4th of July 2025.

Basic requirements to apply for exams are to complete lectures, seminars, and laboratory practices in full.
Students, after fulfilling all the previously stated requirements, may apply for the exam using the AIS2.
The final exam consists of two parts **A** and **B** and for passing the exam it is also required to achieve more than 60% of the points in both parts **A** and **B** individually. The points gained in the exam are multiplied by **0.6** factor and the results from seminars and laboratory practices are added to obtain the final grade.
Precise information about the form of examination will be provided at the end of the semester (before final exams).

Students can register for the exam **three times**, while with the **transferred subject** only **twice**!
The number of gained credits is equal to 8.

In the case that the student is not able to attend the examination she/he must excuse her/his absence within three working days personally, by mail (the date of the post office stamp is authoritative) or e-mail (kchtl@fpharm.uniba.sk). For excuse, only a medical doctor certificate is accepted! In the case that the student does not provide any certificated excuse, the result of the exam is rated FX (failed).

Overall percentage	Final grades
90,0 – 100	**A**
82,0 – 89,9	**B**
74,0 – 81,9	**C**
66,0 – 73,9	**D**
60,0 – 65,9	**E**
less than 60,00	**Fx**

Bratislava, 5th of February 2025

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