

2023/2024. ACADEMIC YEAR							
PROGRAM OF STUDY (FOR STUDENTS OF 2ND YEAR)							
<b>Full (Hun) name of the subject:</b> Szerves kémia II.							
<b>Program: Undivided program (pharmaceutical)</b>							
<b>Schedule: full-time</b>							
<b>Short name of the subject:</b> Org Chem							
<b>English name of the subject:</b> Organic Chemistry II.							
<b>German name of the subject:</b> Organische Chemie II							
<b>Type of registration: obligatory/obligatory elective/elective/criteria requirement</b>							
<b>Neptun code of the subject:</b> GYKSZK274E2A							
<b>Responsible Department:</b> Semmelweis University, Institute of Organic Chemistry							
<b>Responsible tutor</b> Dr. Petra Dunkel				<b>Title, academic degree:</b> assistant professor, PhD			
<b>Contact information:</b> - <b>phone:</b> +36-1-476-3600/53006 - <b>email:</b> dunkel.petra@semmelweis.hu							
<b>Name of the persons responsible for the teaching of the subject:</b> Dr. Balázs Balogh Dr. Dóra Bogdán Dr. Andrea Czompa Dr. Ruth Deme Dr. Petra Dunkel Dr. Zoltán Kaleta Dr. Róbert Ludmerczki Dr. Krisztina Süttőné Kaczeus Bence Kontra Dr. László Piros Patrik Pollák Gergő Riszter				<b>Title, academic degree:</b> assistant professor, PhD assistant lecturer, PhD assistant professor, PhD assistant lecturer, PhD assistant professor, PhD assistant professor, PhD assistant lecturer, PhD research associate PhD student PhD student PhD student PhD student			
<b>Class per week:</b>  4 lecture(s) 4 practice(s)				<b>Credit point(s):</b>  8 credits			
<b>Professional content, intent of acquirement and it's function in order to implement the goals of the program:</b> The course discusses state-of the art synthetic and structural organic chemistry subjects to develop problem-solving skills for organic chemistry and biomolecular sciences. Students will acquire the basics of organic chemistry, develop an organic chemistry perspective and acquire the theoretical, practical and material knowledge base for their future studies.							
<b>Short description of the subject:</b> The course in Organic Chemistry at the Faculty of Pharmaceutical Sciences has two main objectives: a) to provide a modern organic chemistry curriculum and to develop an organic chemistry approach, by presenting typical synthesis methods for the preparation of the different types of compounds and, with particular emphasis, by illustrating and interpreting their chemical reactivity. Introduction to and practical application of the main methods and tools of preparative organic chemistry. b) To provide a solid molecular, organic chemistry base for subsequent subjects in the curriculum of students at the Faculty of Pharmaceutical Sciences and, in particular, to strengthen the molecular approach necessary for biomedical disciplines.							
<b>Course data</b>							
Recommend ed term	Contact hours (lecture)	Contact hours (practice)	Contact hours (seminar)	Individual lectures	Total number of contact hours/semester	Normal course offer	Consult ations

3. semester	4	6 (biweekly)	3 (biweekly)	-	56+36+2 0	Autumn semester* <u>Spring semester</u> Both semesters (* Please underline)	upon demand
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**Program of semester\*\***

**Topics of theoretical classes (pro week):**

- 1. week:** Chemistry literature and databases. Carbon-carbon bond forming reaction with palladium catalysis, organometallic compounds of zinc and magnesium. Inter- and intramolecular reactions.
- 2. week:** Heterocyclic nomenclature. Heterocyclic and heteroaromatic compounds.
- 3. week:**  $\pi$ -Excessive aromatic heterocyclic compounds I.
- 4. week:**  $\pi$ -Excessive aromatic heterocyclic compounds II.
- 5. week:**  $\pi$ -Excessive aromatic heterocyclic compounds III.
- 6. week:**  $\pi$ -Excessive aromatic heterocyclic compounds IV.
- 7. week:**  $\pi$ -Excessive aromatic heterocyclic compounds V.  $\pi$ -Deficient aromatic heterocyclic compounds I.
- 8. week:**  $\pi$ -Deficient aromatic heterocyclic compounds II. Heterocyclic polyenes.
- 9. week:**  $\pi$ -Deficient aromatic heterocyclic compounds III. Organic polymers.
- 10. week:** Amino acids, peptides, proteins. Carbohydrates I.
- 11. week:** Carbohydrates II.
- 12. week:** Nucleosides, nucleotides and nucleic acids. Natural compounds: terpenes, steroids, representatives of the classes, further natural products I.
- 13. week:** Natural compounds: terpenes, steroids, representatives of the classes, further natural products II. Alkaloids I.
- 14. week:** Natural compounds: alkaloids II. Summary of organic chemical reactions, reaction mechanisms, synthesis planning.

**Topics of practical classes (pro week):**

**1. week:** ---

**2. week:** *Nomenclature examples from semester I-II, nomenclature of heterocyclic compounds.*

**3. week:** Chemical bibliography and databases.

**4. week:** *Heterocyclic compounds – advanced synthetic routes and reaction pathways. 3-, 4- and 5-membered heterocycles and possible benzologues.*

**5. week:** 4-Nitrobenzoic acid and phthalimide.

**6. week:** *Heterocyclic compounds – advanced synthetic routes and reaction pathways. 6-, 7- and 8-membered heterocycles and possible benzologues.*

**7. week:** Ethyl-4-nitrobenzoate (from own 4-nitrobenzoic acid) and cyclohexanone oxime.

**8. week:** *Amino acids, peptides, proteins.*

**9. week:** Ethyl-4-aminobenzoate (from own ethyl-4-nitrobenzoate) and *N,N'*-ethylenebis(salicylimine)

**10. week:** *Carbohydrates. General properties and applications of polymers.*

**11. week:** (*E,E*)-1,5-Diphenylpenta-1,4-dien-3-one and students' presentations.

**12. week:** *Solving of stereochemical organic chemistry problems. Alkaloids – chemistry, structure, and syntheses. Some examples for drug synthesis.*

**13. week:** Diethyl 3,5-dimethylpyrrole-2,4-dicarboxylate.

**14. week:** Supplement. Inventory. *Solving of organic chemistry problems. Isoprenoids and steroids – chemistry, structure, and syntheses.*

**Schedule of consultations:** consultation upon request, at least 1 week before the date of consultation

**Course requirements****Prerequisites:**

GYKSZK274E1A

Organic chemistry (theory) I.

<p><b>Conditions of attending the classes, amount of acceptable absents, way of presentation of leave, opportunity for makeup:</b></p> <p>If necessary, students may make up for a limited number of missed or failed preparative experiments after preliminary agreement with the leading instructor at the end of the semester. Without permission, the repetition of unsuccessful experiments is not allowed. Course material for the seminars (problem sets) are provided in advance to the students <i>via</i> Moodle. Students are expected to consult these materials before the respective seminars. These problem sets will form the basis of the discussion. Attendance is mandatory at the seminars. No more than one seminar absence per semester will be accepted without special consequences. A student who misses more seminar classes in their group may attend a seminar of another group (in the same week) if possible (only a limited number of students may be allowed to do so), always by notifying the seminar leaders in advance. If this is not possible, the student (who has more than 2 absences) will be briefly debriefed by the seminar leader on the relevant topics by the end of the semester (however, regular absences are not permitted). The Study and Examination Regulations also require attendance at 75% of the practical sessions and attendance at the seminars (which count as practical sessions) according to the above criteria in order to be signed off at the end of the semester.</p>
<p><b>The grading method; the conditions for getting the signature; the number, topic(s) and date(s) of the mid-term assessments, (reports, term tests), and the process in which they contribute to the final grade; and the possibility of their retake or their upgrading retake (as provided in §§ 25-28 of the STUDY AND EXAMINATION REGULATIONS):</b></p>
<p><b>Number, topics and dates of tests during the semester, opportunities of makeup and improvement of results: Theory:</b> At the mid-term tests (one/semester) students have to answer in a written form questions on the subject-matter of the main lectures, the practicals and the seminars, the dates of which are fixed at the beginning of the semesters. The value of the midterm test can be either ranging 2-5 or failed. If the test is failed or the student did not attend it, the student must attend the following makeup test. If the makeup test is failed, a second makeup test should be written. If any of the makeup tests reach the passmark, then the midterm test is accepted. If also the second makeup test is failed, the student does not get signature for the semester, they are not allowed to sit in the semi-final examination. Grades for the main and makeup mid-term tests of the same topic are not averaged. Students who have a result of at least 90% in the mid-term test (excluding the retake tests) during the semester will have a 5-point advantage in the written exam.</p> <p><b>Practical:</b> at the beginning of each laboratory practical, students must write a short test on the theoretical and practical subject-matter of the experiment. These tests are immediately corrected by the leading instructor, and the practical work can be started only if the short test is accepted. If the test is failed, the experiment in question can be performed only at the end of the semester.</p> <p>Completing successfully the non-preparative practicals during the two semesters is also a condition of the signature and 75% of the maximum number of laboratory notebooks that can be submitted must be also approved.</p>
<p><b>Requirements of signature(as provided for in STUDY AND EXAMINATION REGULATIONS § 29):</b> mid-term test, obtaining a signature, attending practicals and seminars as specified above</p>
<p><b>Number and type of projects students have to perform independently during the semester and their deadlines:</b> completion of the mid-term assessment, completion of practical work, attendance of a sufficient number of seminars (final deadline: last day of the semester)</p>
<p><b>Type of the semester-end examination:</b> signature*/practical grade*/semi-final*/<u>final</u>* (<i>Please underline</i>)</p> <p><b>Examination requirements:</b> as published by the institute on the MOODLE course site by the start of the academic term</p>
<p><b>Form of the semester-end examination:</b> <u>written</u>*/oral*/combined examination/<b>practical examination/the assessment of completing project work (according to STUDY AND EXAMINATION REGULATIONS 30.§)</b>* (<i>Please underline</i>)</p>

**The possibility and conditions for offering grades: -**

**A list of the basic notes, textbooks, resources and literature that can be used to acquire the knowledge necessary to master the curriculum and to complete the assessments, with exact description about which of them is required to acquire which part of the syllabus (e.g. description based on topics)), as well as the main technical and other aids and study aids that can be used:**

Materials of the lectures and practices can be downloaded from Moodle  
P.C. Vollhardt; N.E. Schore: Organic Chemistry: Structure and Function, 8th Edition (W. H. Freeman)  
D.R. Klein: Organic Chemistry, 3rd Edition (Wiley)  
K.L. Williamson, K.M. Masters: Techniques Labs for Macroscale and Microscale Organic Experiments, 7th Edition (Cengage Learning)

**In the case of a subject lasting more than one semester, the position of the teaching/research department on the possibility of parallel enrolment and the conditions for admission\*\*\*\*:**

yes\*/no\*/on an individual assesment basis\* (\* Please underline)

**The course description was prepared by:**

Dr. Petra Dunkel (assistant professor, PhD)

**\*\* A tantárgy tematikáját oly módon kell meghatározni, hogy az lehetővé tegye más intézményben a kreditismerési döntéshozatalt, tartalmazza a megszerzendő ismeretek, elsajátítandó alkalmazási (rész)kézségek, (rész)kompetenciák és attitűdök leírását, reflektálva a szak képzési és kimeneti követelményeire.**