Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

| UČNI NAČRT PREDMETA / COURSE SYLLABUS | |
|---|---|
| **Predmet:** | **Organska kemija 2** |
| **Course title:** | **Organic chemistry 2** |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|---|---|---|---|
| **Enovit magistrski študijski program druge stopnje Predmetni učitelj** | **/** | **2.** | **4.** |
| **Five-year master's degree program Subject Teacher** | **/** | **2.** | **4.** |

**Vrsta predmeta / Course type** Obvezni / Obligatory

**Univerzitetna koda predmeta / University course code:**

| Predavanja<br>Lectures | Seminar<br>Seminar | Vaje<br>Tutorial | | | Klinične vaje<br>Clinical training | Druge oblike študija<br>Other forms of study | Samost. delo<br>Individual work | ECTS |
|---|---|---|---|---|---|---|---|---|
| | | AV | LV | RV | | | | |
| 45 | | | 60 | | | | 75 | 6 |

**Nosilec predmeta / Lecturer:** Peter KRAJNC

| **Jeziki / Languages:** | **Predavanja / Lectures:** | slovenski / slovene |
|---|---|---|
| | **Vaje / Tutorial:** | slovenski / slovene |

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

**Prerequisits:**

| | |
|---|---|
| Znanje splošne in osnovne organske kemije pridobljeno v predhodnem študiju. | Knowledge of general chemistry and beses of organic chemistry acquired at the previous study. |

| **Vsebina (kratek pregled učnega načrta):** | **Content (Syllabus outline):** |
|---|---|
| Organske reakcije: nukleofilne adicije na karbonilno skupino,<br>nukleofilne substitucije in eliminacije na karbonilni skupini,<br>nukleofilne substitucije in eliminacije na sp3 C atomu,<br>polarne adicije.<br>Aromatskost; elektrofilne aromatske substitucije, nukleofilne aromatske substitucije, vplivi substituentov na usmerjanje,<br>radikalske reakcije.<br>Biološko pomembne organske spojine: ogljikovi hidrati.<br>Biološko pomembne organske spojine: aminokisline in proteini.<br>Biološko pomembne organske spojine: lipidi. | Organic reactions: Nu aditions to carbonyl group, Nu substitutions and eliminations to carbonyl group, Nu substitutions and eliminations to sp3 C atom, Polar additions.<br>Aromaticity; electrophilic aromatic substitutions, nucleophilic aromatic substitutions, influence of substituents, radical (single electron transfer) reactions.<br>Biologically important organic compounds: carbohydrates.<br>Biologically important organic compounds: amino acids and proteins.<br>Biologically important organic compounds: lipids. |

**Temeljni literatura in viri / Readings:**

- John McMurry, Organic Chemistry, Cengage Learning, Boston, 2016.
- M. Tišler, Organska kemija, Ljubljana: Fakulteta za kemijo in kemijsko tehnologijo, 2013.

Dodatna priporočena literatura:

- M. A. Fox, J. K. Whitesell, Organic Chemistry, Jones and Barlett, Boston, 2004.
- P. Y. Bruice, Organic chemistry, Prentice Hall, 2006.
- K.P.C. Vollhardt, N.E. Schore, Organic Chemistry - Structure and Function, W. H. Freeman, ~~2014~~ 2018.

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| **Cilji in kompetence:** | **Objectives and competences:** |
|---|---|
| Spoznati vse osnovne tipe organskih reakcij.<br>Razumeti in poznati vplive pogojev na potek reakcij.<br>Znati teoretsko sintetizirati enostavne organske molekule.<br>Znati uporabljati osnovne metode spektroskopije za identifikacijo organskih spojin.<br>Poznati pomen organskih spojin za biološke sisteme. | To know:<br>basic types of organic reactions,<br>meaning of organic compounds for biological systems.<br>To understand the synthetic strategies for simple organic molecules. |

| Predvideni študijski rezultati: | Intended learning outcomes: |
|---|---|
| **Znanje in razumevanje:**<br>Študent je sposoben:<br>• razlikovati osnovne organske reakcije<br>• opisati mehanizme kemijskih reakcij in vplive pogojev na potek reakcije<br>• načrtovati sinteze preprostih organskih molekul | **Knowledge and understanding:**<br>Student is able to:<br>• Distinguish basic organic reactions<br>• describe the mechanisms of organic reactions and influences of reaction conditions<br>• plan the synthesis of simple organic compounds. |
| **Prenesljive/ključne spretnosti in drugi atributi:** | **Transferable/Key Skills and other attributes:** |

| Metode poučevanja in učenja: | Learning and teaching methods: |
|---|---|
| Predavanja, laboratorijske vaje. | Lectures, laboratory course. |

| Načini ocenjevanja: | Delež (v%) | Assessment: |
|---|---|---|
| Izpit je opravljen, če so pozitivno opravljene vse naslednje obveznosti: | | Student has to pass successfully the following obligations: |
| Pisni izpit | 80 | Written exam |
| Laboratorijske vaje | 20 | Laboratory course |

**Reference nosilca / Lecturer's references:**

HOBIGER, Viola, PALJEVAC, Muzafera, KRAJNC, Peter. Emulsion templated porous poly(thiol-enes): influence of photopolymerisation, emulsion composition, and phase behaviour on the porous structure and morphology. Polymers. March 2022, vol. 14, iss. 7, 12 str., ilustr. ISSN 2073-4360. DOI: 10.3390/polym14071338.

RAVBAR, Miha, KOLER, Amadeja, PALJEVAC, Muzafera, KRAJNC, Peter, KOLAR, Mitja, ISKRA, Jernej. Reusable Pd-PolyHIPE for Suzuki–Miyaura coupling. ACS omega. 2022, vol. 7, no. 15, str. 12610–12616, ilustr. ISSN 2470-1343. DOI: 10.1021/acsomega.1c06318. [COBISS.SI-ID 104201731]

KOLER, Amadeja, KOLAR, Mitja, JEŘÁBEK, Karel, KRAJNC, Peter. Influence of functional group

concentration on hypercrosslinking of poly(vinylbenzyl chloride) PolyHIPEs: upgrading macroporosity with nanoporosity. Polymers. 14 Avg. 2021, vol. 13, iss. 16, str. 1-10, ilustr. ISSN 2073-4360. DOI: 10.3390/polym13162721.

HOBIGER, Viola, ZAHORANOVA, Anna, BAUDIS, Stefan, LISKA, Robert, KRAJNC, Peter. Thiol-Ene cross-linking of Poly(ethylene glycol) within high internal phase emulsions: degradable hydrophilic PolyHIPEs for controlled drug release. Macromolecules. Nov. 23, 2021, vol. 54, iss. 22, str. 10370-10380, ilustr. ISSN 1520-5835. DOI: 10.1021/acs.macromol.1c01240.

KAWADA, Kosuke, OKANO, Koji, ISKRA, Jernej, KRAJNC, Peter, CAHARD, Dominique. SelectfluorTM on a PolyHIPE material as regenerative and reusable polymer-supported electrophilic fluorinating agent. Advanced Synthesis & Catalysis, ISSN 1615-4150. [Print ed.], 2017, vol. 359, no. 4, str. 584-589, doi: 10.1002/adsc.201601312.