



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 Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	2	Poletni
Five-year master's degree program Subject Teacher	/		Spring

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

17-UK44

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
45			60		75	6

Nosilec predmeta / Lecturer:

Peter KRAJNC

Jeziki / Predavanja / Lectures:

slovenski / slovene

Languages:

Vaje / Tutorial:

slovenski / slovene

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

Znanje splošne in osnovne organske kemije.

Prerequisites:

Knowledge of general chemistry and bases of organic chemistry.

Vsebina:

Aromatičnost; elektrofilne aromatske substitucije, vplivi substituentov na usmerjanje, radikalske reakcije.

Sintetični in naravni polimeri; polimerizacija.

Osnove spektroskopskih metod za organske spojine: NMR, IR, masna spektroskopija.

Biološko pomembne organske spojine: ogljikovi hidrati.

Biološko pomembne organske spojine: aminokisliline in proteini.

Biološko pomembne organske spojine: lipidi.

Laboratorijske vaje:

osnovne tehnike sinteze organskih spojin.

Content (Syllabus outline):

Aromaticity; electrophilic aromatic substitutions, influence of substituents, radical (single electron transfer) reactions.

Synthetic and natural polymers, polymerisations.

Bases of spectroscopy of organic compounds: NMR, IR, mass spectroscopy.

Biologically important organic compounds: carbohydrates.

Biologically important organic compounds: amino acids and proteins.

Experimental course:

basic techniques of organic synthesis.

Temeljni literatura in viri / Readings:

1. M. Tišler, Organska kemija, DZS Ljubljana, 1982.
2. S. Pine, Organic chemistry, McGraw-Hill, New York, 1987.
3. M. A. Fox, J. K. Whitesell, Organic Chemistry, Jones and Barlett, Boston, 1997.
4. P. Y. Bruice, Organic chemistry, Prentice Hall, 2006.
5. P. Krajnc, Navodila za vaje iz organske kemije, Maribor, 2007.

Cilji in kompetence:

Spoznati vse osnovne tipe organskih reakcij.

Razumeti in poznati vplive pogojev na potek reakcij.

Znati teoretsko sintetizirati enostavne organske molekule.

Znati uporabljati osnovne metode spektroskopije za identifikacijo organskih spojin.

Poznati pomen organskih spojin za biološke sisteme.

Objectives and competences:

To know:

basic types of organic reactions,

meaning of organic compounds for biological systems.

To understand the synthetic strategies for simple organic molecules.

Predvideni študijski rezultati:**Znanje in razumevanje:**

Študent pozna osnovne organske reakcije.

Razume mehanizme kemijskih reakcij in vplivov pogojev na potek reakcije.

Pozna spektroskopske metode za karakterizacijo organskih molekul.

Zna načrtovati sinteze preprostih organskih molekul.

Prenesljive/ključne spretnosti in drugi atributi:**Intended learning outcomes:****Knowledge and understanding:**

Student knows basic organic reactions.

Understands the mechanisms of organic reactions and influences of reaction conditions.

Knows the spectroscopic methods for the characterisations of organic molecules.

Can plan the synthesis of simple organic compounds.

Transferable/Key Skills and other attributes:**Metode poučevanja in učenja:**

Predavanja, seminarsko delo, laboratorijske vaje.

Learning and teaching methods:

Lectures, seminar work, laboratory experiments.

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Pisni izpit (ali kolokviji)

80

Written exam (or partial exams)

Laboratorijske vaje

20

Lab work

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

1. KOVAČIČ, Sebastijan, JEŘÁBEK, Karel, KRAJNC, Peter, SLUGOVC, Christian. Ring opening metathesis polymerisation of emulsion templated dicyclopentadiene giving open porous materials with excellent mechanical properties. *Polymer chemistry*. [Print ed.], Feb. 2012, vol. 3, iss. 2, str. 325-328, doi: 10.1039/c2py00518b.

2. MAJER, Janja, KRAJNC, Peter. Amine functionalisations of glycidyl methacrylate based polyHIPE monoliths. *Macromol. symp.*, Oct. 2010, vol. 296, iss. 1, str. 5-10, doi: 10.1002/masy.201051002.

3. PULKO, Irena, KRAJNC, Peter. High internal phase emulsion templating - a path to hierarchically porous functional polymers. *Macromol. rapid commun.*, 2012, vol. 33, issue 20, str. 1731-1746, doi: [10.1002/marc.201200393](https://doi.org/10.1002/marc.201200393).

4. PULKO, Irena, SANDHOLZER, Martina, KOLAR, Mitja, SLUGOVC, Christian, KRAJNC, Peter. Removal of an olefin metathesis catalyst using 4-nitrophenyl acrylate based polymer supports. *Tetrahedron lett.* [Print ed.], 2010, vol. 51, issue 44, str. 5827-5829, doi: 10.1016/j.tetlet.2010.08.114.

5. PULKO, Irena, WALL, Jennifer, KRAJNC, Peter, CAMERON, Neil R. Ultra-high surface area functional porous polymers by emulsion templating and hypercrosslinking : efficient nucleophilic catalyst supports. *Chemistry (Weinh., Print)*. [Print ed.], Feb. 2010, vol. 16, iss. 8, str. 2350-2354, doi: 10.1002/chem.200903043.

Projekti/Projects:

L2—2008 Makroporozne polimerne membrane za separacijo biomakromolekul

L2—2283 Vpliv sestave polimerizacijske mešanice na latnosti poroznih monolitov

J2—1176 Separacija in formulacija biološko aktivnih snovi izoliranih iz rastlinskih materialov