



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Ime predmeta:	Osnove okoljske kemije
Course title:	Principles of Environmental Chemistry

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
Ekologija z naravovarstvom / 1. stopnja	/	1	Poletni
Ecology with Nature Conservation / 1. level	/	1	Spring

**Vrsta predmeta (obvezni ali izbirni) /
Course type (compulsory or elective)**

Obvezni
Obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial			Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
		AV	LV	RV				
30	10		30			5	105	6

**Nosilec predmeta / Course
coordinator:**

Peter Krajnc

Jeziki /Languages:

Predavanja / Lectures: Slovenski /Slovene

Vaje / Tutorial: Slovenski /Slovene

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

Znanje splošne kemije.

**Prerequisites for enrolling in the course or for
performing study obligations:**

Proficiency in general chemistry.

Vsebina (kratek pregled učnega načrta):

Vsebina predmeta obravnava kemijske procese v okolju, s poudarkom na povezanosti med njimi in njihovimi vplivi na ekosisteme.

Poudarek je na naslednjih poglavjih:

- Kaj je okoljska kemija
- Kemija atmosfere
- Kemija hidrosfere
- Kemija pedosfere
- Onesnaževanje zraka, vode in tal
- Biogeokemijski cikli
- Globalne spremembe in fosilna goriva

Content (syllabus outline):

The content of the course is based on discussing and explaining the chemical processes in the environment, with the emphasis on their interconnectivity and their influence on the ecosystems. The focus is on the following chapters:

- What is environmental chemistry
- Atmospheric chemistry
- Hydrosphere chemistry
- Chemistry of the pedosphere
- Air, water and soil pollution
- Biogeochemical cycles
- Global changes and fossil fuels

Temeljni literatura in viri / Reading materials:

1. Jeffrey S. Gaffney, Nancy A. Marley: **Chemistry of Environmental Systems: Fundamental Principles and Analytical Methods**, Wiley, 2020.
2. Connell, D. W.: **Basic Concepts of Environmental Chemistry**, Lewis Publishers, 2005.
3. Harrison, R. M. (Ed.): **Principles of Environmental Chemistry**, The Royal Society of Chemistry, 2007.

Cilji in kompetence:

- zna razložiti strukturne vplive spojin na reaktivnost in metabolizem v okolju
- zna predstaviti kemizem najpogostejših spojin, ki onesnažujejo okolje (polutantov)
- razume medsebojno povezanost ciklov elementov in njihov vpliv na ekosisteme

Objectives and competences:

- can explain the structural influences of compounds on the environment
- can present the chemistry of the most common pollutants
- understand the interconnectivity of element cycles and their influence on ecosystems

Predvideni študijski rezultati:

Znanje in razumevanje:

- študenti prepoznajo polutante in toksine v okolju
- študenti znajo naštet in opisati osnovne kemijske procese preoblikovanja molekul
- študenti prepoznajo povezanost kemijskih ciklusov okolja
- študenti identificirajo in interpretirajo kemijske procese v atmosferi, sladkih in slanih vodah ter v pedosferi

Intended learning outcomes:

Knowledge and understanding:

- students identify pollutants and toxins in environment
- students are able to list and describe the basic concepts of chemical reactions
- students recognize the connection between the environmental elemental cycles
- students identify and interpret chemical processes in atmosphere, fresh and salt waters and in pedosphere.

Metode poučevanja in učenja:

- Predavanja
- Seminar
- Laboratorijske vaje
- Terensko delo

Learning and teaching methods:

- Lectures
- Seminar
- Laboratory work
- Field work

Načini ocenjevanja:**Delež/Share (%) Assessment methods:**

Pisni izpit (ali kolokviji)	65	Written exam (or partial exams)
Laboratorijske vaje	20	Laboratory course
Seminarska naloga	15	Seminar work

Reference nosilca / Course coordinator's references:

1. RAVBAR, Miha, KOLER, Amadeja, PALJEVAC, Muzafera, KRAJNC, Peter, KOLAR, Mitja, ISKRA, Jernej. Reusable Pd-PolyHIPE for Suzuki–Miyaura Coupling. *ACS omega.*, 2022, 4 str.
2. IVANOVIĆ, Milena, ALBREHT, Alen, KRAJNC, Peter, VOVK, Irena, ISLAMČEVIĆ RAZBORŠEK, Maša. Sustainable ultrasound-assisted extraction of valuable phenolics from inflorescences of *Helichrysum arenarium* L. using natural deep eutectic solvents. *Industrial crops and products.*, 2021, vol. 160, str. 1-11.
3. ISLAMČEVIĆ RAZBORŠEK, Maša, IVANOVIĆ, Milena, KRAJNC, Peter, KOLAR, Mitja. Choline chloride based natural deep eutectic solvents as extraction media for extracting phenolic compounds from chokeberry (*Aronia melanocarpa*). *Molecules.*, 2020, vol. 25, str. 1-14.
4. GOLUB, Doris, KRAJNC, Peter. Emulsion templated hydrophilic polymethacrylates. Morphological features, water and dye absorption. *Reactive & functional polymers*, 2020, vol. 149, str. 1-12.
5. KOLER, Amadeja, GORNIK, Tjaša, KOSJEK, Tina, JEŘÁBEK, Karel, KRAJNC, Peter. Preparation of molecularly imprinted copoly(acrylic acid-divinylbenzene) for extraction of environmentally relevant sertraline residues. *Reactive & functional polymers*, 2018, vol. 131, str. 378-383.