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
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	2.	4.
Five-year master´sdegree program Subject Teacher	/	2nd	4th

Vrsta predmeta (obvezni ali izbirni) / Course type (compulsory or elective)	Izbirni Elective
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				
15			15				60	3

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:	**Prerequisites for enrolling in the course or for performing study obligations:**
Jih ni.	No.

Vsebina (kratek pregled učnega načrta):

Najprej so utrdijo osnovni pojmi splošne kemije, ki so nujno potrebni za razumevanje okoljskih kemijskih procesov, v drugem delu predmeta pa je več povedano o kemiji procesov v okolju. Poudarek je na naslednjih poglavjih:

- Kaj je okoljska kemija
- Človeški vplivi na biogeokemijske cikluse
- Sestava atmosfere, urbana atmosfera
- Učinki onesnaženja zraka
- Procesi čiščenja zračnih polutantov
- Kemija stratosfere

Content (syllabus outline):

Firstly, basic principles and laws of general chemistry, which are needed for the understanding of the environmental chemistry, are explained. In the continuation of the course, the emphasis is on the chemistry of environmental processes. The focus is on the following chapters:

- What is environmental chemistry
- Human effects on biogeochemical cycles
- Effects of air pollution
- Processes of air purification
- Stratosphere chemistry

• Organski polutanti • Globalne spremembe	• Chemistry of continental waters and oceans

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:	**Objectives and competences:**
• zna razložiti strukturne vplive spojin na reaktivnost in metabolizem v okolju • zna predstaviti kemizem najpogostejših spojin, ki onesnažujejo okolje (polutantov) • zna predstaviti cikle elementov v okolju	• can explain the structural influences of compounds on the environment • can present the chemistry of the most common pollutants • can present elemental cycles in environment

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Študenti: • poznajo in razložijo osnovne koncepte okoljske kemije, • razlikujejo in opišejo biogeokemijske cikluse, • prepoznajo polutante in toksine v atmosferi ter razložijo njihov vpliv na okolje, • razlikujejo med stratosferskim in troposferskim ozonom • poznajo in uporabijo standardizirane enote uporabne v okoljski kemiji (npr. ppm) • naštejejo in opišejo tehnike analize ozračja	**Knowledge and understanding:** Students: • know and explain the basic concepts of environmental chemistry, • distinguish and describe biogeochemical cycles, • identify pollutants and toxins in the atmosphere and explain their effects on the environment, • distinguish between stratospheric and tropospheric ozone • know and use standardized units useful in environmental chemistry (e.g. ppm) • name and describe the techniques of atmospheric analysis

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Laboratorijske vaje	• Lectures • Laboratory work

Načini ocenjevanja:	**Delež**/Share (%)	**Assessment methods:**
Pisni izpit	80	Written exam (or partial exams)
Laboratorijske vaje	20	Laboratory course

Reference nosilca / Course coordinator's references:

1. HOBIGER, Viola, KOLER, Amadeja, KOTEK, Jiri, KRAJNC, Peter. Emulsion templated poly(thiol-enes): Selective oxidation improves mechanical properties. *Reactive & functional polymers*, 2023, vol. 186, str. 6.

2. RAVBAR, Miha, KOLER, Amadeja, PALJEVAC, Muzafera, KRAJNC, Peter, KOLAR, Mitja, ISKRA, Jernej. Reusable Pd-PolyHIPE for Suzuki–Miyaura Coupling. *ACS omega*, 2022, 4 str.
3. 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.
4. 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.
5. GOLUB, Doris, **KRAJNC, Peter**. Emulsion templated hydrophilic polymethacrylates. Morphological features, water and dye absorption. *Reactive & functional polymers*, 2020, vol. 149, str. 1-12.