



Univerza v Mariboru

Fakulteta za naravoslovje  
in matematiko

### UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz ekotoksikologije
Course title:	Selected topics in Ecotoxicology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1.- 4.; 1st-4th
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type: Izbirni/Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
25	5				150	6

Nosilec predmeta / Lecturer: Julija Volmajer Valh

Jeziki / Predavanja / Lectures: slovenski / Slovene  
Languages: Vaje / Tutorial: slovenski / Slovene

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

Poznavanje kemije in biokemije na ravni univerzitetnega programa.

**Prerequisites:**

Knowledge of chemistry and biochemistry at graduate level.

**Vsebina:**

Definicije v ekotoksikologiji

Tipi onesnaževanja okolja:

- Kovine
- Nekovine
- Organske snovi
- Organokovinske snovi

Načini vnosa določenih onesnaževal v ekosisteme.

**Content (Syllabus outline):**

Definitions in ecotoxicology

Different pollutants:

- Metals
- Non-metals
- Organic compounds
- Organometallic compounds

Entry of specific pollutants in ecosystems;  
Study of mechanisms of some selected

Mehanizmi delovanja nekaterih izbranih onesnaževal.  
Napredne analizne metode v ekotoksikologiji in ocena tveganja za različne onesnaževalce nizkih koncentracij.  
Biomarkerji in biosenzorji.

pollutans;  
Advanced testing in ecotoxicology and risk assessment of chemicals of low doses;  
Biomarkers and biosensors.

#### **Temeljni literatura in viri / Readings:**

Visser, J.E., Ecotoxicology Around the Globe, 2010, Nova Science Publishers, Incorporated  
Various scientific papers chosen according to selected topics.

#### **Cilji in kompetence:**

Znati tipe onesnaževal, njihovo razporejanje v ekosistemih. Identificirati učinke onesnaženja v nizkih koncentracijah na populacije in ekosisteme. Razumeli oceno tveganja in delovanje biomarkerjev in biosenzorjev. Zmožnost izvedbe različnih testov toksičnosti.

#### **Objectives and competences:**

Students learn:  
Various types of pollutants and their distributions in ecosystems  
Testing methods in ecotoxicology  
Effects of pollutants of low concentrations on populations and ecosystems  
Risk assessment  
Biomarkers and biosensors  
Know the types of pollutants and their distribution in ecosystems. Identify the effects of low-level pollution on populations and ecosystems. Understand risk assessment and the performance of biomarkers and biosensors.  
Be able to perform different toxicity tests.

#### **Predvideni študijski rezultati:**

##### **Znanje in razumevanje:**

Ob koncu tega predmeta bodo študentje zmožni:

Ugotoviti učinke onesnaženja na populacije in ekosisteme. Sklepati o nekaterih mehanizmih v ekotoksikologiji. Zmožnost samostojne izvedbe zastavljenih testov toksičnosti. Pojasniti delovanje biomarkerjev in biosenzorjev.

##### **Prenesljive/ključne spretnosti in drugi atributi:**

#### **Intended learning outcomes:**

##### **Knowledge and understanding:**

By the end of this course, students will be able to:  
Determine the effects of pollution on populations and ecosystems. Be able to independently perform tests using biomarkers and biosensors.

##### **Transferable/Key Skills and other attributes:**

- Communication skills

- Spretnosti komuniciranja
- Reševanja problemov
- Aktivno sodelovanje pri predavanjih
- Spretnosti priprave seminarskih nalog in javnega nastopanja
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- Problems solving ability
- Collaboration during lectures
- Active participation in lectures
- Ability to prepare a seminar work and public presentations

**Metode poučevanja in učenja:**

**Learning and teaching methods:**

- Predavanja
- Seminar

- Lectures
- Seminar work

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

- Pisni izpit
- Projektno naravnana seminarska naloga

50%  
50%

- Written exam
- Project oriented seminar work

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

- 1.
2. ERJAVEC, Alen, PLOHL, Olivija, FRAS ZEMLIČ, Lidija, VOLMAJER VALH, Julija. Significant fragmentation of disposable surgical masks—enormous source for problematic micro/nanoplastics pollution in the environment. *Sustainability*. Oct. 2022, vol. 14, iss. 19 (12625), str. 1-20. ISSN 2071-1050. <https://www.mdpi.com/2071-1050/14/19/12625>, DOI: [10.3390/su141912625](https://doi.org/10.3390/su141912625). [COBISS.SI-ID [124689155](https://www.cobiss.si/id/124689155)]
3. LOBNIK, Aleksandra, VONČINA, Bojana, MAJCEN LE MARECHAL, Alenka, GUTMAHER, Andreja, POBERŽNIK, Mojca, VAJNHANDL, Simona, VOLMAJER VALH, Julija, KOŠAK, Aljoša, KLASINC, Aljaž, BRAČKO, Tara, ŠKODIČ, Lidija, ŠIMON, Ernest, TROPPEZ, Vittoria, LUTZ, Walter, TYLER, David J., KOKOSSIS, Antonis, DAURIAT, Arnaud, DELAHAY, Richard J. A new circular economy concept for textiles and chemicals : H2020project final report : project duration: 01.06.2015 - 31.05.2019 (48 months). [Maribor [etc.]: s.n.], 2019. 91 f., ilustr. [COBISS.SI-ID 58593027]
4. VUJANOVIĆ, Annamaria, PUHAR, Jan, ČOLNIK, Maja, PLOHL, Olivija, VIDOVIČ, Timotej, VOLMAJER VALH, Julija, ŠKERGET, Mojca, ČUČEK, Lidija. Sustainable industrial ecology and environmental analysis: a case of melamine etherified resin fibres. *Journal of cleaner production*. [Print ed.]. 1 Oct. 2022, vol. 369, 13 str. ISSN 0959-6526. DOI: [10.1016/j.jclepro.2022.133301](https://doi.org/10.1016/j.jclepro.2022.133301). [COBISS.SI-ID [118212611](https://www.cobiss.si/id/118212611)]  
financer: ARRS, Projekt, J7-3149, SI, Design and Management of Sustainable Plastic Value Chains to Support a Circular Economy Transition; ARRS, Program, P2-0412, SI; ARRS, Program, P2-0421, SI; ARRS, Projekt, N2-0138, SI; Ministry of Education, Science and Sport of Republic of Slovenia and the European Regional Development Fund, Projekt, 5442–1/2018/106, SI

5. VAJNHANDL, Simona, ŠKODIČ, Lidija, SIMONIČ, Marjana, LOBNIK, Aleksandra, VOLMAJER VALH, Julija. Enhanced photocatalytic oxidation of reactive dye using manganese catalyst complex. *Chemical industry & chemical engineering quarterly*. 2022, vol. 28, iss. 1, str. 73-84. ISSN 1451-9372. DOI: [10.2298/CICEQ201202019V](https://doi.org/10.2298/CICEQ201202019V). [COBISS.SI-ID [66992643](https://www.cobiss.si/id/66992643)]

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