Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Izbrana poglavja iz onesnaževanja okolja**
Course title:	**Selected Topics in Environmental Pollution**

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., 2. ali 3.; 1st or 2nd or 3rd**
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
5	5				140	5

Nosilec predmeta / Lecturer: Ernest VONČINA

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Poznavanje ekologije in biokemije na ravni univerzitetnega programa ter humane ekologije na ravni drugostopenskega programa	Knowledge of ecology and biochemistry at graduate level, and human ecology at master level

Vsebina:	**Content (Syllabus outline):**
Obravnavana so izbrana poglavja iz naslednjih sklopov. Onesnaževanje zraka (kisli dež, smog, učinek tople grede, trdni delci, ozonska luknja). Značilnosti, viri in učinki vodnih onesnažil (težke kovine, hraniva (dušikove in fosforjeve spojine), detergenti, ogljikovodiki in olja, prekurzorji trihalometanov, druga nevarna onesnažila), točkovni in razpršeni viri	Selected topics in the following chapters are discussed. Air pollution (acid rain, smog, greenhouse effect, particulates, ozone hole). Characteristics, sources and effects of water pollution (heavy metals, organic waste (nitrogen and phosphorus compounds), detergents, hydrocarbons and oil, trihalomethane precursors, other dangerous pollutants), point

onesnaževanja, strategije za zmanjševanje onesnaževanja (tekoči in plinasti izpusti, zmanjševanje onesnaževanja v kmetijstvu), onesnaževanje tal, primeri strategije nadzora onesnaževanja okolja v Sloveniji (popisi emisijskih virov, kakovost okolja, ugotavljanje stopnje onesnaženosti, sedanji vpliv onesnaženosti, možne strategije nadzora onesnaženosti zraka, vode in tal), zakonodaja s področij zraka, vode in tal, monitoring (fizikalni, kemijski in biološki) zraka, vode in tal.	and distribution sources of pollution, strategies for reducing pollution (liquid and gaseous emissions, reducing pollution in agriculture), soil pollution, examples of monitoring strategies of environmental pollution in Slovenia (listing of emission sources, environmental quality, determining the level of pollution, current effect of pollution, possible monitoring strategies of air, water and soil pollution), laws from the areas of air, water and soil, monitoring (physical, chemical and biological) air, water and soil.

Temeljni literatura in viri / Readings:

- Agencija RS za okolje, Ljubljana, 2003: Okolje v Sloveniji 2002.
- Ribarič-Lasnik, C., I. Eržen, N. Kugonič, B. Pokorny, D. Končnik, M. Svetina, B. Justin, P. Druks, M.

Bole, A. Rošer-Drev, M. Vetrih, J. Flis, K. Kotnik, R. Mavsar, L. Pačnik, K. Savinek, 2002: Primerjalna študija onesnaženosti okolja v Zgornji Mežiški dolini med stanji v letih 1989 in 2001: končno poročilo. Zv.
1-6. Velenje: ERICO, november 2002.

- Spletna stran Ministrstva za okolje in prostor: http://www.gov.si/mop/

Cilji in kompetence:	**Objectives and competences:**
Podrobno seznaniti študente z najpomembnejšimi točkovnimi in netočkovnimi viri onesnaževanja zraka, vode in tal ter z zaščito za normalni razvoj vseh živih organizmov (rastline, živali, ljudje) pred onesnaževanjem • Študentje bodo dobili podroben pregled nad vrstami onesnažil, njihovi identifikaciji v okolju in osnovni zaščiti pred njimi	• To infrom students in detail about the most important point- and non-point sources of air, water and soil pollution as well as about protection for normal development of all living organisms (plants, animals, humans) against polution • Students will obtain advanced overview on types of pollutants, their identification in the environment and fundamantal protection against them.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • Onesnažila zraka, vode in tal • Monitoring onesnažil • Zaščita pred onesnažili • Zmanjševanja in preprečevanja onesnaževanja okolja	**Knowledge and understanding:** • Air, water and soil pollutants • Mointoring of pollutants • Protection from pollutants • Reducing and preventing environmental pollution

Prenesljive/ključne spretnosti in drugi atributi:	**Transferable/Key Skills and other attributes:**
Študenti znajo kreativno uporabiti pridobljeno znanje pri reševanju konkretnih problemov onesnaževanja okolja	Students are able to use creatively the theoretical knowledge in solving concrete problmes of the environmental pollution

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Laboratorijske vaje • Terenske vaje • Seminar • Razprave	• Lectures • Laboratory excercises • Field work • Seminar • Discussions

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Seminarska naloga z zagovorom • Pisni izpit	50 % 50 %	• Seminar essay and its defence • Written exam

Reference nosilca / Lecturer's references:

1. KRANVOGL, Roman, KNEZ, Jure, MIUC, Alen, VONČINA, Ernest, BRODNJAK-VONČINA, Darinka, VLAISAVLJEVIĆ, Veljko. Simultaneous determination of phthalates, their metabolites, alkylphenols and bisphenol a using GC-MS in urine of men with fertility problems. *Acta chimica slovenica*, ISSN 1318-0207. [Tiskana izd.], 2014, vol. 61, no. 1, str. 110-120. http://acta.chem-soc.si/61/61-1-110.pdf. [COBISS.SI-ID 17710102]

2. KNEZ, Jure, KRANVOGL, Roman, BREZNIK, Barbara, VONČINA, Ernest, VLAISAVLJEVIĆ, Veljko. Are urinary bisphenol A levels in men related to semen quality and embryo development after medically assisted reproduction?. *Fertility and sterility*, ISSN 0015-0282. [Print ed.], Jan. 2014, vol. 101, no. 1, str. 215-221. http://www.sciencedirect.com/science/article/pii/S0015028213031026#, doi: 10.1016/j.fertnstert.2013.09.030. [COBISS.SI-ID 4809023]

3. PAVŠIČ, Primož, MLADENOVIČ, Ana, MAUKO, Alenka, KRAMAR, Sabina, DOLENEC, Matej, VONČINA, Ernest, PAVŠIČ VRTAČ, Katarina, BUKOVEC, Peter. Sewage sludge / biomass ash based products for sustainable construction. *Journal of cleaner production*, ISSN 0959-6526. [Print ed.], 2013. http://www.sciencedirect.com/science/article/pii/S0959652613008883, doi: dx.doi.org/10.1016/j.jclepro.2013.12.034. [COBISS.SI-ID 1998695]

4. ALFIREVIĆ, Marjetka, KRIŽANEC, Boštjan, VONČINA, Ernest, BRODNJAK-VONČINA, Darinka. Presence of nonylphenols in plastic films and their migration into food simulants. *Acta chimica slovenica*, ISSN 1318-0207. [Tiskana izd.], 2011, vol 58, no. 1, str. 127-133. http://acta.chem-soc.si/58/58-1-127.pdf. [COBISS.SI-ID 14880790]

5. KAIŠAREVIĆ, Sonja N., HILSCHEROVA, Klara, WEBER, Roland, SUNDQVIST, Kristina L., TYSKLIND, Mats, VONČINA, Ernest, BOBIC, Stanka, ANDRIĆ, Nebojša, POGRMIC-MAJKIC, Kristina, VOJINOVIĆ-MILORADOV, Mirjana, GIESY, John Paul, KOVAČEVIĆ, Radmila. Characterization of dioxin-like contamination in soil and sediments from the "hot spot" area of petrochemical plant in Pancevo

(Serbia). *Environmental science and pollution research international*, ISSN 0944-1344. [Print ed.], 2011, vol. 18, no. 4, str. 677-686, doi: 10.1007/s11356-010-0418-8. [COBISS.SI-ID 15555606]