



Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in
matematiko / Faculty of Natural
Sciences and Mathematics



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Nevarne snovi v bivalnem okolju
Subject Title:	Pollutants in Living Environment

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Biologija in ekologija z naravovarstvom / Biology and ecology with nature conservation	Ekologija z naravovarstvom /Ecology with Nature Conservation	2	3

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30	30		15		135	7

Nosilec predmeta / Lecturer:

Ernest VONČINA

Jeziki /

Languages:

Predavanja / Lecture: slovenski / Slovenian

Vaje / Tutorial: slovenski / Slovenian

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

Prerequisites:

Vsebina:

Predmet obravnava problematiko onesnaževanja okolja z organskimi spojinami. Podaja in opisuje eksterno in interno izpostavljenost človeka v bivalnem okolju s kontaminanti. Poudarja pomembnost izpostavljenosti za okoljsko ozadje značilnim koncentracijam nevarnih spojin v bivalnem in širšem okolju.

Razumevanje vpliva onesnažil na bivalno okolje in na zdravje ljudi je pomembno za ohranjanje čistega okolja. Pri predmetu se študenti seznani z nevarnimi spojinami, ki so predvsem posledica antropogenega vpliva na okolje. Seznanijo se z metodami za ugotavljanje vsebnosti onesnaži in njihovih razgradnih produktov v okolju.

Predmet obravnava onesnažila kot so policiklični aromatski ogljikovodiki, nitrozamini, fenolne spojine, pesticidi in tradicionalni organoklorini insekticidi, onesnažila s področja tehničnih kemikalij kot so estri ftalne in fosforjeve kisline, poliklorirani naftaleni, bifenili, dioksini in furani, polibromirani difenil etri vključno z perfluoriranimi spojinami površinsko aktivnih snovi. Predmet podaja porazdeljevanje spojin v okolju (zrak, voda, sediment/zemlja), njihovo obstojnost, globalno razširjenost, biotsko koncentriranje in razgradnjo, ter daje pregled nad potencialno nevarnostjo, ki jo

Contents (Syllabus outline):

Understanding the environment pollution with hazardous substances. The subject explains external and internal exposure of humans to pollutants and the importance of exposure to background pollutant concentrations in living environment.

Understanding influence of pollutants on the environment and human health is essential for preserving clear environment. Students are acquainted with hazardous substances which are mostly a consequence of anthropogenic impact on environments. They gain knowledge of methods for determination of pollutants and their degradation products in the environment.

The subject is dealing with pollutants such as: polycyclic aromatic hydrocarbons, nitrozamines, phenolic compounds, pesticides and traditional organochloric insecticides, esters of phthalic and phosphoric acids as technical chemicals pollutants, polychlorinated naphthalenes, biphenyls, dioxins and furans, polybrominated diphenyl ethers including perfluorinated substances of surface active compounds. Subject is discussing the distribution of hazardous substances in environment (air, water, sediment/soil), their persistence, global distribution, biotic concentration and degradation. It surveys potential risk of hazardous substances.

predstavljajo.

Predmet obravnava pomembnejše spojine, ki onesnažujejo (spreminjajo) okolje predvsem kot motilci naravnega hormonalnega (endokrinega) ravnotežja človeka. Sem spadajo naravne estrogene spojine in spojine, ki jih je proizvedel človek hote za potrebe industrije in kmetijstva ter spojine, ki nastajajo nehote, kot stranski produkti industrijskih procesov.

Pri predavanjih so obravnavane posamezne skupine organskih onesnažil okolja:

- Kemijska opredelitev spojin z njihovimi fizikalno-kemijskimi lastnostmi kot skupinskimi parametri
- S fizikalno-kemijskimi lastnostmi podprto porazdeljevanje spojin v okolju (voda, zrak, sediment)
- Različne poti vstopanja predstavljenih spojin v okolje in možnosti ter sposobnosti okolja za njihovo razgradnjo
- Poti vstopanja spojin v prehranjevalno verigo človeka in nevarnosti, ki jo predstavljajo za njegovo zdravje
- Poti razširjanja in preprečevanja razširjanja nevarnih spojin v okolje
- Različni analitski postopki za določevanje organskih onesnažil
- Predavanja bodo širila zavest o pomembnosti ohranjanja zdravega okolja

Subject gives knowledge on important substances which can modify environment especially as disruptors of natural hormonal endocrinal equilibrium of human organism. These substances are natural estrogen compounds and substances made by human for use in industry and agriculture, and substances made unintentionally as byproducts in industrial processes.

The subject addresses particular groups of environmental organic pollutants:

- Chemical identification of substances by their physical and chemical properties as grouping parameters.
- Distribution of substances in environment (water, air, sediment) on the base of their physical-chemical properties.
- Different modes of introducing hazardous substances into environment and environment ability for their degradation.
- Mode of incoming of substances into the food chain of humans and risks for human health.
- Modes of distribution and prevention of distribution of hazardous substances into environment.
- Different analytical methods for determination of organic pollutants.
- The subject will help to propagate ideas of importance to preserve clear environment.

Temeljni študijski viri / Textbooks:

- Baird, C., 1995: Environmental Chemistry, New York.
- Colborn, T., D. Dumanoski, J. P. Myers, 1996: Our Stolen Future, A Dutton Book, Penguin Group.
- Fellenberg, G., 2000: The Chemistry of pollution, John Wiley and Sons, LTD, Chichester, New York.
- Hutzinger, O. 1984: The Handbook of Environmental Chemistry, The Natural Environment and Biogeochemical Cycles, Springer-Verlag, Berlin, Heidelberg.
- Moore, J. W. , 1991: Inorganic Contaminants of surface water, Research and monitoring priorities, Springer –Verlag.

Cilji:

Študenti

- Razumejo metode, ki so v uporabi v moderni okoljski kemiji za odkrivanje in določanje vsebnosti nevarnih snovi in njihovih razgradnih produktov v okolju
- Usvojijo temeljno in poglobljeno znanje o prisotnosti nevarnih snovi v okolju
- Spoznajo osnovne principe delovanja nevarnih snovi na človeka
- Spoznajo področja uporabe znanj o vplivu nevarnih snovi na okolje
- Spoznajo principe preprečevanja onesnaževanja

Objectives:

Students:

- Understand basic methods used in modern environmental chemistry for detecting and determining the contents of hazardous substances and their degradation products in environments
- They acquire basic and advanced knowledge necessary to study the occurrence of hazardous substances in environment
- They get knowledge of basic principles of influences of hazardous substances on humans.
- They get knowledge of fields where knowledge of hazardous substances influences on environment can be applied

	<ul style="list-style-type: none"> They are acquainted with basic principles of prevention of contamination
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Predvideni študijski rezultati:

Intended learning outcomes:

<p>Znanje in razumevanje:</p> <p>Študenti</p> <ul style="list-style-type: none"> Razumejo osnovne metode v okoljski kemiji Usvojijo temeljno in poglobljeno znanje s področja nevarnih snovi v okolju Razumejo znanja okoljske kemije, ki so nujno potrebna na drugih področjih obravnave okolja Spoznajo področja, na katerih se aplicirajo znanje o nevarnih snoveh v okolju <p>Prenesljive/ključne spretnosti in drugi atributi:</p> <p>Študenti</p> <ul style="list-style-type: none"> Pridobijo izkušnje in laboratorijske spretnosti, ki so nujno potrebne pri samostojnem laboratorijskem delu So sposobni razumeti znanstvene prispevke in zahtevnejšo študijsko literaturo 	<p>Knowledge and Understanding:</p> <p>Students:</p> <ul style="list-style-type: none"> Understand basic methods used in modern environmental chemistry Acquire basic and advanced knowledge of hazardous substances in environment Understand the knowledge of environmental chemistry essential for other subjects in the field of environment. Gain knowledge of areas in which knowledge of hazardous substances in environment is applied <p>Transferable/Key Skills and other attributes:</p> <p>Students:</p> <ul style="list-style-type: none"> Acquire experience and laboratory skills which are essential for an autonomous laboratory work They are able to understand articles in basic scientific journals and more advanced text-books
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Metode poučevanja in učenja:

Learning and teaching methods:

<ul style="list-style-type: none"> Predavanja Laboratorijske vaje Seminarska naloga 	<ul style="list-style-type: none"> Lectures Laboratory excersises Seminar essay
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Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

<ul style="list-style-type: none"> Laboratorijski dnevnik Kolokvij iz analiznih metod Pisni izpit 	20 40 40	<ul style="list-style-type: none"> Diary of laboratory exercises Partial exam of analytical methods Written exam
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Materialni pogoji za izvedbo predmeta :

Material conditions for subject realization

<ul style="list-style-type: none"> Multimedijska predavalnica Analizni laboratorij 	<ul style="list-style-type: none"> Lecture hall for multimedia presentations Laboratory for chemical analyses
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Obveznosti študentov:

Students' commitments:

<i>(pisni, ustni izpit, naloge, projekti)</i>	<i>(written, oral examination, coursework, projects):</i>
<ul style="list-style-type: none"> Laboratorijski dnevnik Kolokvij iz analiznih metod Pisni izpit 	<ul style="list-style-type: none"> Diary of laboratory exercises Partial exam of analytical methods Written exam