

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

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| <b>Predmet:</b>      | VPLIV KMETIJSTVA NA OKOLJE          |
| <b>COURSE TITLE:</b> | ENVIRONMENTAL IMPACT OF AGRICULTURE |

| Študijski program in stopnja<br>Study programme and level               | Študijska smer<br>Study field         | Letnik<br>Academic year             | Semester<br>Semester |
|---|---------------------------------------|-------------------------------------|----------------------|
| Varstvo okolja in ekotehnologije,<br>1. stopnja                         | Modul: Raba in varstvo tal            | 2. in 3.                            | /                    |
| Environmental Protection and<br>Eco-technologies, 1 <sup>st</sup> level | Module: Use and protection of<br>soil | 2 <sup>nd</sup> and 3 <sup>rd</sup> | /                    |

**Vrsta predmeta / Course type** Modularni predmet / Modular subject

**Univerzitetna koda predmeta / University course code:** VKO

| Predavanja<br>Lectures | Seminar<br>Seminar | Sem. Vaje<br>Tutorial | Lab. vaje<br>Laboratory<br>work | Teren. vaje<br>Field work | Samost. delo<br>Individ. work | ECTS |
|------------------------|--------------------|-----------------------|---------------------------------|---------------------------|-------------------------------|------|
| 20                     | /                  | 30                    | /                               | /                         | 90                            | 5    |

**Nosilec predmeta / Lecturer:** prof. dr. Andrej Simončič / Andrej Simončič, Ph.D., Full Prof.

**Jeziki / Predavanja / Lectures:** Slovenski / Slovenian  
**Languages: Vaje / Tutorial:** Slovenski / Slovenian

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

Pogojev ni.

**Prerequisites:**

No formal prerequisites.

**Vsebina:**

**Kmetijstvo in okolje**

- Izhodišče in splošni del;
- Glavni dejavniki obremenjevanja okolja v kmetijstvu;
- Vrste kmetijske pridelave glede na možen vpliv na okolje: Konvencionalna pridelava; Integrirana pridelava; Ekološka pridelava;

**Dušik in dušikove spojine**

- Splošno o dušiku v kmetijstvu; Dušikov cikel; Pojavne oblike ter transformacije dušika; Vrste dušikovih gnojil; Vzroki za onesnaževanje z dušikovimi spojinami; Težave, ki jih povzročajo dušikove spojine v okolju; Možnosti preprečevanja izpiranja dušikovih spojin v okolje;

**Fosfor**

- Splošno o fosforju v kmetijstvu; Cikel fosforja; Izgube fosforja v okolju; Vrste fosforjevih gnojil; Težave, ki jih povzroča fosfor v okolju; Možnosti preprečevanja prekomernega obremenjevanja okolja s fosforjem;

**Content (Syllabus outline):**

**Agriculture and the environment**

- The introduction and the general part;
- Main factors of environmental pollution in agriculture;
- Types of agricultural production with regard to the potential impact on the environment: Conventional production; Integrated production; Organic production;

**Nitrogen and nitrogen compounds**

- Nitrogen in agriculture in general; Nitrogen cycle; Occurrence forms and nitrogen transformation; Types of nitrogen fertilizers; Causes of pollution by nitrogen compounds; Problems caused by nitrogen compounds in the environment; Possibilities of preventing nitrogen compounds from being leached into the environment;

**Phosphorus**

- Phosphorus in agriculture in general; Phosphorus cycle; Loss of phosphorus in the environment; Types of phosphorus fertilizers; Problems caused by phosphorus in the environment; Possibilities for

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| <p><b>Erozija tal</b></p> <ul style="list-style-type: none"> <li>• Občutljivost tal za degradacijo ter erozijo; Vplivi erozije na okolje; Ukrepi za preprečevanje erozije;</li> </ul> <p><b>Organski odpadki</b></p> <ul style="list-style-type: none"> <li>• Organski odpadki v kmetijstvu – splošno; Odpadki na kmetiji; Nekmetijski organski odpadki na kmetijskih površinah; Ukrepi za preprečevanje negativnih vplivov uporabe organskih odpadkov;</li> </ul> <p><b>Emisije v zraku</b></p> <ul style="list-style-type: none"> <li>• Emisije in kmetijstvo – splošno; Emisije amonija (NH<sub>3</sub>); Emisije metana (CH<sub>4</sub>); Emisije ogljikovega dioksida (CO<sub>2</sub>); Emisije amonija (NH<sub>3</sub>); Neželeni vonji v kmetijstvu;</li> </ul> <p><b>Fitofarmacevtska sredstva (FFS)</b></p> <ul style="list-style-type: none"> <li>• FFS in kmetijstvo – splošno; Delitev FFS; Ekotoksikološke lastnosti FFS; Usoda in obnašanje FFS v okolju; Ocena tveganja uporabe FFS v okolju; Ukrepi za zmanjšanje negativnih vplivov FFS v okolju;</li> </ul> <p><b>Genetsko spremenjeni organizmi (GSO) v kmetijstvu</b></p> <ul style="list-style-type: none"> <li>• GSO in kmetijstvo – splošno; Tveganja ter prednosti uporabe GSO; Vrsta GSO v kmetijstvu; Ocena tveganja uporabe GSO v okolju;</li> </ul> <p><b>Zakonodaja na področju kmetijstva in varstva okolja v Sloveniji</b></p> <ul style="list-style-type: none"> <li>• Vrste zakonskih in podzakonskih aktov; Pregled predpisov s področja kmetijstva; Pregled predpisov s področja okolja; Pregled predpisov s področja zdravstva; Ostali predpisi;</li> </ul> <p><b>Dobra kmetijska praksa (DKP):</b></p> <ul style="list-style-type: none"> <li>• DKP – splošno; DKP in varstvo površinskih voda in podtalnice; DKP in varstvo tal; DKP in varstvo zraka; DKP in biološka pestrost; DKP reje živali; DKP in varna hrana</li> </ul> | <p>preventing excessive environmental pollution with phosphorus;</p> <p><b>Erosion of soil</b></p> <ul style="list-style-type: none"> <li>• soil sensitivity for degradation and erosion; Effects of erosion on the environment; Measures to prevent erosion;</li> </ul> <p><b>Organic waste</b></p> <ul style="list-style-type: none"> <li>• Organic waste in agriculture in general; Waste on farm; Non-agricultural organic waste on agricultural land; Measures to prevent the negative effects of the use of organic waste;</li> </ul> <p><b>Emissions in the air</b></p> <ul style="list-style-type: none"> <li>• Emissions and agriculture in general; Ammonia emissions (NH<sub>3</sub>); Methane emissions (CH<sub>4</sub>); Carbon dioxide (CO<sub>2</sub>) emissions; Ammonia emissions (NH<sub>3</sub>); Undesirable scents in agriculture;</li> </ul> <p><b>Plant protection products (PPP)</b></p> <ul style="list-style-type: none"> <li>• PPP and agriculture in general; Division of PPPs; Ecotoxicological properties of PPP; Fate and behavior of PPP in the environment; Risk Assessment of use of PPP in the environment; Measures to reduce the negative impacts of PPPs in the environment;</li> </ul> <p><b>Genetically modified organisms (GMOs) in agriculture</b></p> <ul style="list-style-type: none"> <li>• GMOs and agriculture in general; Risks and benefits of using GMOs; Type of GMOs in agriculture; Risk Assessment of the use of GMOs in the environment;</li> </ul> <p><b>Legislation in the field of agriculture and environmental protection in Slovenia</b></p> <ul style="list-style-type: none"> <li>• Types of statutory and implementing regulations; Review of regulations in the field of agriculture; Review of environmental regulations; Review of health regulations; Other regulations;</li> </ul> <p><b>Good Agricultural Practice (GAP)</b></p> <ul style="list-style-type: none"> <li>• GAP in general; GAP and water protection; GAP and soil protection; GAP and air protection; GAP and biodiversity; GAP and animal husbandry; GAP and food safety;</li> </ul> |
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**Temeljni literatura in viri / Textbooks:**

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| <ul style="list-style-type: none"> <li>• Merrington, G., et al. 2002. Agricultural pollution. Environmental Problems and Practical Solutions; Spon Press. London and New York, 243 s.</li> <li>• Šarić, T., Gadžo, D. 1998. Uticaj poljoprivrednih hemikalija na okolinu; IGP Garmond i Ekobih, Sarajevo, 130 s.</li> <li>• Urek, G. in sod. 2013. Temeljna načela dobre kmetijske prakse varstva rastlin in varne rabe fitofarmacevtskih sredstev; ur. Urek, G. in Persolja, J.; Ministrstvo za kmetijstvo in okolje in Kmetijski inštitut Slovenije, Ljubljana, maj 2013, 266 s.</li> <li>• Zakonski in podzakonski akti s področja kmetijstva ter varstva okolja v EU in Sloveniji./ Legislation in the field of agriculture and environmental protection in EU and Slovenia.</li> </ul> |
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**Cilji in kompetence:**

- sposoben poiskati ustrezne podatke o kmetijskih vplivih na okolje, jih preveriti, oceniti in kritično uporabljati;
- obvladal osnove okoljskih dejavnikov v kmetijstvu s sposobnostjo povezovanja znanja z drugimi področji (ekologija, biologija, biodiverziteta, prostorsko planiranje, ...);
- razvijal veščine za interdisciplinarno razmišljanje o kmetijskih vplivih v prostoru in njegovi rabi za namene kmetijstva;
- razvijal sposobnost sodelovanja v diskusijah o vplivih kmetijstva v okolju;
- sposoben razumeti ter reševati konflikte s področja kmetijstva v širšem slovenskem prostoru;
- poznal načela okoljskih presoj vplivov in osnove spremljanja stanja okolja;
- usposobljen uporabljati informacijsko-komunikacijske tehnologije in informacijske sisteme za spremljanje stanja okolja;
- sposoben posredovati znanje in informacije o okoljskih vsebinah širši javnosti v ustni in pisni obliki.

**Objectives and competences:**

- to be able to find relevant information on agricultural impacts on the environment, check, evaluate and critically use them;
- to master the basics of environmental factors in agriculture with the ability to integrate knowledge with other fields (ecology, biology, biodiversity, spatial planning, ...);
- to develop skills for interdisciplinary thinking about agricultural impacts in the environment and its use for agricultural purposes;
- to develop ability to participate in discussions on the impacts of agriculture in the environment;
- to be able to understand and resolve conflicts in the field of agriculture in the wider Slovene area;
- acquainting with the principles of environmental impact assessments and the basics of different environmental monitorings;
- to get competences for the use of information and communication technology and information systems for monitoring the state of the environment;
- to be able to communicate knowledge and information of environmental content to the general public in oral and written form.

**Predvideni študijski rezultati:**

- znanje in razumevanje vloge kmetijstva v prostoru;
- znanje in razumevanje okoljskih dejavnikov na področju kmetijske pridelave;
- obvladanje načel varstva okolja, zakonodaje, teoretičnih osnov in praktičnih rešitev v okviru kmetijske pridelave;
- sposobnost samostojnih manj zahtevnih strokovnih analiz pri iskanju rešitev za ohranitev okolja; oziroma izboljšanje stanja okolja in izdelave ocen tveganj za posamezne kmetijske ukrepe v prostoru;
- sposobnost komuniciranja z drugimi interesnimi skupinami na področju varovanja okolja.

**Intended learning outcomes:**

- knowledge and understanding of the role of agriculture in space;
- knowledge and understanding of environmental factors in the field of agricultural production;
- mastering the principles of environmental protection, legislation, theoretical bases and practical solutions in the context of agricultural production;
- the ability of independent, less demanding expert analyzes in finding solutions for preserving the environment; or improving the state of the environment and making risk assessments for individual agricultural measures in the environment;

**Metode poučevanja in učenja:****Oblike dela:**

- predavanja
- samostojno delo študentov/tk

**Metode dela:**

- razlaga
- dialog, diskusija
- preučevanje praktičnih primerov
- aktivno skupinsko delo
- vključevanje strokovnjakov za posamezna področja
- priprava, predstavitev in zagovor seminarske naloge

**Learning and teaching methods:****Forms of teaching:**

- In-class lectures
- Individual work of students

**Teaching methods:**

- Explanation
- Discussion, debate
- Practical demonstration
- Teamwork
- Involvement of experts in the specific fields
- preparation, presentation of a seminar paper

**Načini ocenjevanja:**

Delež (v %) /

Weight (in %)

**Assessment:**

- pisni izpit
- priprava, predstavitev in zagovor seminarske naloge

**100**

- written exam
- preparation, presentation and defence of seminar paper

Študent mora izdelati seminarsko nalogo, ki je pogoj za pristop h končnemu pisnemu izpitu

Seminar paper, which is a prerequisite for final written examination, is required.

**Ocenjevalna lestvica:**

- nezadostno (1): 0-10 %
- nezadostno (2): 11-20 %
- nezadostno (3): 21-30 %
- nezadostno (4): 31-40 %
- nezadostno (5): 41-50 %
- zadostno (6): 51-60 %
- dobro (7): 61-70 %
- prav dobro (8): 71-80 %
- prav dobro (9): 81-90 %
- odlično (10): 91-100 %

**Grading system:**

- Insufficient (1): 0-10 %
- Insufficient (2): 11-20 %
- Insufficient (3): 21-30 %
- Insufficient (4): 31-40 %
- Insufficient (5): 41-50 %
- Sufficient D (6): 51-60 %
- Good C (7): 61-70 %
- Very good B (8): 71-80 %
- Very good B+ (9): 81-90 %
- Excellent A (10): 91-100 %

**Materialni pogoji za izvedbo predmeta :**

Računalniško opremljena predavalnica z internetnim dostopom in elektronska prosojnica.

**Material conditions for subject realization:**

computer equipped classroom with the multimedia equipment and internet.

**Obveznosti študentov:**

Pisni izpit in seminarska naloga.

**Student's commitments:**

Written examination and Seminar paper.

**Reference nosilca predmeta:****Tehnična znanja in kompetence**

- Ko-ordinator več kot 15 nacionalnih in mednarodnih projektov na področju kmetijstva in okolja;
- 15 letne izkušnje na področju svetovanja z več kot 500 predavanji za različne ciljne skupine (kmetijski pridelovalci, kmetijski svetovalci,

**Lecturer's references:****Job-related skills**

- Co-ordinator of more than 15 national and international projects in the field of agriculture and ecology;
- 15 years of experiences in Advisory Service with over 500 lectures for different target groups (farmers, advisory officers, students, pupils, allotment holders, pesticide merchants and dealers), over 150 professional

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| <p>študenti, dijaki, vrtničkarji, prodajalci in trgovci s FFS),</p> <ul style="list-style-type: none"> <li>▪ Več kot 150 znanstvenih in strokovnih člankov s področja kmetijstva, varstva rastlin in varstva okolja;</li> <li>▪ Udeležba na dveh enotedenskih izobraževanjih na BBA, Braunschweig, Nemčija, EU Registration Directive 91/414 – A training seminar (1997, 1999);</li> <li>▪ Udeležba na konferenci Contaminated Land Management Conference (London, 1999);</li> <li>▪ Udeležba na konferenci Human Health Risk Assessments for Agrochemicals (London, 2000);</li> <li>▪ ECCO Overview Meeting, Round 10, Braunschweig, Nemčija, Sep. 2001;</li> <li>▪ Udeležba na konferenci An Introduction to Groundwater Pollution, Prevention and Remediation, (London, januar 2002);</li> <li>▪ TAIEX Study visit of PSD (Efficacy, Ecology and Pesticide registration procedures) (York, VB, feb. 2002);</li> <li>▪ ECCO Per Review Meeting York – Fate and behavior of pesticides (april 2002),</li> <li>▪ Dvotedenski obisk PSD (Pesticide Safety Directorate), Fate and behaviour of Pesticides in the soil, A Phare training seminar (junij 2003);</li> <li>▪ Študijski obisk Haskell Agricultural Laboratory, Department of Agronomy and Horticulture, University of Nebraska, USA – GMO technology and research in weed control (Junij 2008);</li> <li>▪ Izkušnje na področju dodiplomskega, podiplomskega in podoktorskega študija in raziskovanja;</li> <li>▪ Od 1999 dalje vabljeni predavatelj za herbologijo: BF – Agronomija, UL;</li> <li>▪ Od 2003 daljeizr. prof. – področje FFS, Ekologija FFS, FKVB, UM;</li> <li>▪ Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, BF, UL;</li> <li>▪ Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, FAMNIT, UP;</li> </ul> | <p>articles; All activities are related to agriculture, plant protection and ecology;</p> <ul style="list-style-type: none"> <li>▪ Two one week visits of BBA, EU Registration Directive 91/414 – A training seminar (1997 and 1999);</li> <li>▪ Contaminated Land Management Conference in London (1999);</li> <li>▪ Human Health Risk Assessments for Agrochemicals Conference in London (2000);</li> <li>▪ ECCO Overview Meeting, Round 10, Braunschweig, Germany, Sep. 2001;</li> <li>▪ An Introduction to Groundwater Pollution, Prevention and Remediation, London, Jan. 2002;</li> <li>▪ TAIEX Study visit of PSD (Efficacy, Ecology and Pesticide registration procedures) in York, Feb. 2002;</li> <li>▪ ECCO Per Review Meeting in York – Fate and behaviour, apr. 2002),</li> <li>▪ Two weeks visit of PSD (Pesticide Safety Directorate), Fate and behaviour of Pesticides in the soil – A Phare training seminar (June 2003);</li> <li>▪ Study visit of Haskell Agricultural Laboratory, Department of Agronomy and Horticulture, University of Nebraska, USA – GMO technology and research in weed control (June 2008);</li> <li>▪ Experience with undergraduate, graduate and postdoctoral teaching and research;</li> <li>▪ 1999 onwards - Ad hoc lectures on herbology: Biotechnical Faculty – Agronomy, University of Ljubljana;</li> <li>▪ 2003 onwards - Assoc. Prof. – Plant Protection, Ecology of Pesticides, University of Maribor, Faculty of Agriculture and Life Sciences;</li> <li>▪ Invited professor for Plant Protection and Ecology of Pesticides, University Ljubljana, Biotechnical Faculty;</li> <li>▪ Invited professor for Plant Protection and Ecology of Pesticides, University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies;</li> </ul> |
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