

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	VPLIV KMETIJSTVA NA OKOLJE
COURSE TITLE:	ENVIRONMENTAL IMPACT OF AGRICULTURE

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

Vrsta predmeta / Course type Modularni predmet / Modular subject

Univerzitetna koda predmeta / University course code: VKO

Predavanja Lectures	Seminar Seminar	Sem. Vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo 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 dušikovitih gnojil; Vzroki za onesnaževanje z dušikovimi spojinami; Težave, ki jih povzročajo dušikove spojine v okolju; Možnosti preprečevanja izpiranja dušikovitih spojin v okolje;

Fosfor

- Splošno o fosforju v kmetijstvu; Cikel fosforja; Izgube fosforja v okolju; Vrste fosforjevih gnojil; Težave, ki jih povzročajo 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

<p>Erozija tal</p> <ul style="list-style-type: none"> • Občutljivost tal za degradacijo ter erozijo; Vplivi erozije na okolje; Ukrepi za preprečevanje erozije; <p>Organski odpadki</p> <ul style="list-style-type: none"> • Organski odpadki v kmetijstvu – splošno; Odpadki na kmetiji; Nekmetijski organski odpadki na kmetijskih površinah; Ukrepi za preprečevanje negativnih vplivov uporabe organskih odpadkov; <p>Emisije v zraku</p> <ul style="list-style-type: none"> • Emisije in kmetijstvo – splošno; Emisije amonija (NH₃); Emisije metana (CH₄); Emisije ogljikovega dioksida (CO₂); Emisije amonija (NH₃); Neželeni vonji v kmetijstvu; <p>Fitofarmaceutvska sredstva (FFS)</p> <ul style="list-style-type: none"> • 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; <p>Genetsko spremenjeni organizmi (GSO) v kmetijstvu</p> <ul style="list-style-type: none"> • GSO in kmetijstvo – splošno; Tveganja ter prednosti uporabe GSO; Vrsta GSO v kmetijstvu; Ocena tveganja uporabe GSO v okolju; <p>Zakonodaja na področju kmetijstva in varstva okolja v Sloveniji</p> <ul style="list-style-type: none"> • Vrste zakonskih in podzakonskih aktov; Pregled predpisov s področja kmetijstva; Pregled predpisov s področja okolja; Pregled predpisov s področja zdravstva; Ostali predpisi; <p>Dobra kmetijska praksa (DKP):</p> <ul style="list-style-type: none"> • 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 	<p>preventing excessive environmental pollution with phosphorus;</p> <p>Erosion of soil</p> <ul style="list-style-type: none"> • soil sensitivity for degradation and erosion; Effects of erosion on the environment; Measures to prevent erosion; <p>Organic waste</p> <ul style="list-style-type: none"> • 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; <p>Emissions in the air</p> <ul style="list-style-type: none"> • Emissions and agriculture in general; Ammonia emissions (NH₃); Methane emissions (CH₄); Carbon dioxide (CO₂) emissions; Ammonia emissions (NH₃); Undesirable scents in agriculture; <p>Plant protection products (PPP)</p> <ul style="list-style-type: none"> • 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; <p>Genetically modified organisms (GMOs) in agriculture</p> <ul style="list-style-type: none"> • 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; <p>Legislation in the field of agriculture and environmental protection in Slovenia</p> <ul style="list-style-type: none"> • Types of statutory and implementing regulations; Review of regulations in the field of agriculture; Review of environmental regulations; Review of health regulations; Other regulations; <p>Good Agricultural Practice (GAP)</p> <ul style="list-style-type: none"> • 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;
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Temeljni literatura in viri / Textbooks:

<p>Obvezna literatura:</p> <ul style="list-style-type: none"> • Blažič, M. in sod. 2022. Temeljna načela dobre kmetijske prakse varstva rastlin in varne rabe fitofarmaceutskih sredstev; ur. Žigon, P.; MKGP, Uprava za varno hrano, veterinarstvo in varstvo rastlin in Kmetijski inštitut Slovenije, Ljubljana, maj 2022, 252 s. <p>Priporočena literatura:</p> <ul style="list-style-type: none"> • Merrington, G., et al. 2002. Agricultural pollution. Environmental Problems and Practical Solutions; Spon Press. London and New York, 243 s. • Šarić, T., Gadžo, D. 1998. Uticaj poljoprivrednih hemikalija na okolinu; IGP Garmond i Ekobih, Sarajevo, 130 s.

- 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.

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, biodiverziteteta, 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;

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

<ul style="list-style-type: none"> sposobnost komuniciranja z drugimi interesnimi skupinami na področju varovanja okolja. 	<p>risk assessments for individual agricultural measures in the environment;</p>
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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:
<ul style="list-style-type: none"> pisni izpit priprava, predstavitev in zagovor seminarske naloge <p>Študent mora izdelati seminarsko nalogo, ki je pogoj za pristop h končnemu pisnemu izpitu</p> <p>Ocenjevalna lestvica:</p> <ul style="list-style-type: none"> nezadostno (1): 0-10 % nezadostno (2): 11-20 % nezadostno (3): 21-30 % nezadostno (4): 31-40 % nezadostno (5): 41-50 % <u>zadostno (6): 51-60 %</u> dobro (7): 61-70 % prav dobro (8): 71-80 % prav dobro (9): 81-90 % odlično (10): 91-100 % 	100	<ul style="list-style-type: none"> written exam preparation, presentation and defence of seminar paper <p>Seminar paper, which is a prerequisite for final written examination, is required.</p> <p>Grading system:</p> <ul style="list-style-type: none"> Insufficient (1): 0-10 % Insufficient (2): 11-20 % Insufficient (3): 21-30 % Insufficient (4): 31-40 % Insufficient (5): 41-50 % <u>Sufficient D (6): 51-60 %</u> 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.
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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, študenti, dijaki, vrtničkarji, prodajalci in trgovci s FFS),
- Več kot 150 znanstvenih in strokovnih člankov s področja kmetijstva, varstva rastlin in varstva okolja;
- Udeležba na dveh enotedenskih izobraževanjih na BBA, Braunschweig, Nemčija, EU Registration Directive 91/414 – A training seminar (1997, 1999);
- Udeležba na konferenci Contaminated Land Management Conference (London, 1999);
- Udeležba na konferenci Human Health Risk Assessments for Agrochemicals (London, 2000);
- ECCO Overview Meeting, Round 10, Braunschweig, Nemčija, Sep. 2001;
- Udeležba na konferenci An Introduction to Groundwater Pollution, Prevention and Remediation, (London, januar 2002);
- TAIEX Study visit of PSD (Efficacy, Ecology and Pesticide registration procedures) (York, VB, feb. 2002);
- ECCO Per Review Meeting York – Fate nad behavior of pesticides (april 2002),
- Dvotedenski obisk PSD (Pesticide Safety Directorate), Fate and behaviour of Pesticides in the soil, A Phare training seminar (junij 2003);
- Študijski obisk Haskell Agricultural Laboratory, Department of Agronomy and Horticulture, University of Nebraska, USA – GMO technology and research in weed control (Junij 2008);
- Izkušnje na področju dodiplomskega, podiplomskega in podoktorskega študija in raziskovanja;
- Od 1999 dalje vabljeni predavatelj za herbologijo: BF – Agronomija, UL;
- Od 2003 dalje izr. prof. – področje FFS, Ekologija FFS, FKVB, UM;
- Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, BF, UL;
- Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, FAMNIT, UP;

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 articles; All activities are related to agriculture, plant protection and ecology;
- Two one week visits of BBA, EU Registration Directive 91/414 – A training seminar (1997 and 1999);
- Contaminated Land Management Conference in London (1999);
- Human Health Risk Assessments for Agrochemicals Conference in London (2000);
- ECCO Overview Meeting, Round 10, Braunschweig, Germany, Sep. 2001;
- An Introduction to Groundwater Pollution, Prevention and Remediation, London, Jan. 2002;
- TAIEX Study visit of PSD (Efficacy, Ecology and Pesticide registration procedures) in York, Feb. 2002;
- ECCO Per Review Meeting in York – Fate nad behaviour, apr. 2002),
- Two weeks visit of PSD (Pesticide Safety Directorate), Fate and behaviour of Pesticides in the soil – A Phare training seminar (June 2003);
- Study visit of Haskell Agricultural Laboratory, Department of Agronomy and Horticulture, University of Nebraska, USA – GMO technology and research in weed control (June 2008);
- Experience with undergraduate, graduate and postdoctoral teaching and research;
- 1999 onwards - Ad hoc lectures on herbology: Biotechnical Faculty – Agronomy, University of Ljubljana;
- 2003 onwards - Assoc. Prof. – Plant Protection, Ecology of Pesticides, University of Maribor, Faculty of Agriculture and Life Sciences;
- Invited professor for Plant Protection and Ecology of Pesticides, University Ljubljana, Biotechnical Faculty;
- Invited professor for Plant Protection and Ecology of Pesticides, University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies;