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, 1st level	Module: Use and protection of soil	2nd and 3rd	/

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:	izr. prof. dr. Andrej Simončič

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Pogojev ni.	No formal prerequisites.

Vsebina:	**Content (Syllabus outline):**
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;	**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

Erozija tal

- Občutljivost tal za degradacijo ter erozijo; Vplivi erozije na okolje; Ukrepi za preprečevanje erozije;

Organski odpadki

- Organski odpadki v kmetijstvu – splošno; Odpadki na kmetiji; Nekmetijski organski odpadki na kmetijskih površinah; Ukrepi za preprečevanje negativnih vplivov uporabe organskih odpadkov;

Emisije v zraku

- Emisije in kmetijstvo – splošno; Emisije amonija (NH_3); Emisije metana (CH_4); Emisije ogljikovega dioksida (CO_2); Emisije amonija (NH_3); Neželeni vonji v kmetijstvu;

Fitofarmacevtska sredstva (FFS)

- 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;

Genetsko spremenjeni organizmi (GSO) v kmetijstvu

- GSO in kmetijstvo – splošno; Tveganja ter prednosti uporabe GSO; Vrsta GSO v kmetijstvu; Ocena tveganja uporabe GSO v okolju;

Zakonodaja na področju kmetijstva in varstva okolja v Sloveniji

- Vrste zakonskih in podzakonskih aktov; Pregled predpisov s področja kmetijstva; Pregled predpisov s področja okolja; Pregled predpisov s področja zdravstva; Ostali predpisi;

Dobra kmetijska praksa (DKP):

- 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

preventing excessive environmental pollution with phosphorus;

Erosion of soil

• soil sensitivity for degradation and erosion; Effects of erosion on the environment; Measures to prevent erosion;

Organic waste

• 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;

Emissions in the air

• Emissions and agriculture in general; Ammonia emissions (NH3); Methane emissions (CH4); Carbon dioxide (CO2) emissions; Ammonia emissions (NH3); Undesirable scents in agriculture;

Plant protection products (PPP)

• 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;

Genetically modified organisms (GMOs) in agriculture

• 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;

Legislation in the field of agriculture and environmental protection in Slovenia

• Types of statutory and implementing regulations; Review of regulations in the field of agriculture; Review of environmental regulations; Review of health regulations; Other regulations;

Good Agricultural Practice (GAP)

• 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;

Temeljni literatura in viri / Textbooks:

- 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.
- 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.
- 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:	Objectives and competences:
• 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.	• 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:	Intended learning outcomes:
• 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.	• 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:	Learning and teaching methods:
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	**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 Študent mora izdelati seminarsko nalogo, ki je pogoj za pristop h končnemu pisnemu izpitu 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 %	**100**	• written exam • preparation, presentation and defence of seminar paper Seminar paper, which is a prerequisite for final written examination, is required. 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 :	Material conditions for subject realization:
Računalniško opremljena predavalnica z internetnim dostopom in elektronska prosojnica.	computer equiped classroom with the multimedia equipment and internet.

Obveznosti študentov:	Student's commitments:
Pisni izpit in seminarska naloga.	Written examination and Seminar paper.

Reference nosilca predmeta:	Lecturer's references:
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,	**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

študenti, dijaki, vrtičkarji, prodajalci in trgovci s FFS), ▪ Več kot 150 znanstvenih in strokovnih člankov s področja kmetijstva, varstva rastln 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, FKBV, UM; ▪ Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, BF, UL; ▪ Vabljeni predavatelj za varstvo rastlin in ekologijo FFS, FAMNIT, UP;	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;