

Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

CURRICULUM

University Graduate Study Programme

ECOLOGICAL AGRICULTURE

Academic Year 2022-23

June, 2022

List of Teachers and Courses

Academic year 2022 - 23

University Graduate Study Programme

ECOLOGICAL AGRICULTURE

A full-time Study Programme

ECOLOGICAL AGRICULTURE, I. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					TV	AV	LV	
Mirjana Brmež	Ecological Agriculture and Standards	Mirjana Brmež Anita Liška Josipa Puškarić	45 15	10	5			6
Irena Jug	Ecosystems in Ecological Agriculture	Irena Jug Boris Đurđević Ružica Lončarić Dalida Galović Ljubica Ranogajec	20 7 15 8	20 5				6
Bojan Stipešević	Basics of Ecological plant production	Bojan Stipešević Danijel Jug Vlado Guberac Sonja Vila Bojana Brozović	30 20 3 2 10	5	5			6
Ivana Varga	Ecological Crop Production and Horticulture	Ivana Varga Tomislav Vinković Mirta Rastija Aleksandar Stanisavljević Ranko Gantner Vladimir Jukić	15 15 15 10 10 10					6
Luka Šumanovac	Mechanization in Ecological Agriculture	Luka Šumanovac Mladen Jurišić Domagoj Zimmer	35 10 5	15		10		6

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ECOLOGICAL AGRICULTURE, II. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
Brigita Popović	Fertilization in Ecological Agriculture	Zdenko Lončarić	15	5 5			5 5	6
		Brigita Popović	20					
		Vladimir Ivezić	10					
		Vjekoslav Tadić	10					
Karolina Vrandečić	Plant protection in ecological production	Karolina Vrandečić	10	10	5	10	10	6
		Mirjana Brmež	15					
		Vlatka Rozman	5					
		Renata Baličević	10					
		Marija Ravlić						
		Tamara Siber						
Zvonko Antunović	Ecological Zoo-technique	Zvonko Antunović	15					6
		Josip Novoselec	5					
		Pero Mijić	15					
		Davor Kralik	5					
		Danijela Samac	20					
		Željka Klir Šalavardić	5					
Ružica Lončarić	Market and Marketing of Ecological Products	Ružica Lončarić	35	15				6
		Igor Kralik	15					
		Sanja Jelić Milković						
Gabriella Kanižai Šarić	Microorganisms in Ecological Production	Gabriella Kanižai Šarić	50	10			15	6
ECOLOGICAL AGRICULTURE, III. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
	Elective course							6
	Elective course							6
	Elective course							6
	Elective course							6
ECOLOGICAL AGRICULTURE, IV. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FP	AP	LP	
Andrijana Rebekić	Practical work II	Andrijana Rebekić				75		6

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	Master thesis								30
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ECOLOGICAL AGRICULTURE AND STANDARDS		
Coordinator	Mirjana Brmež	
Collaborators	Anita Liška Josipa Puškarić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (60 L + 5 P + 10 S)
COURSE DESCRIPTION		
Course aims	Introducing students to the basic principles, standards, and forms of organic agriculture, as well as prescribed measures and methods in accordance with existing laws and regulations	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. describe the characteristics, position, and importance of organic agriculture in relation to other agricultural management systems; 2. recommend production directions and argue the advantages of crop cultivation without the use of agrochemicals. Identify the advantages and disadvantages of various technologies in plant production (conventional vs. organic); 3. explain standardization measures and the distinctiveness of organic agricultural products; 4. organize work and independently manage technological processes in organic agriculture on their own farm as well as within larger production systems; and 5. independently present information, problems, and solutions within the domain of organic agriculture. 		
Assessment and evaluation of student work during classes		
In determining the final grade for students, continuous monitoring of class participation is taken into account (class activity, preparation for lessons, and reflective commentary on course content), along with a seminar paper and a written examination. The grade for the seminar paper includes the clarity, accuracy, and relevance of the information presented in the written seminar, as well as the overall (technical and visual) quality of the presentation. The Final Examination is mandatory.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Kisić I. (2013): <i>Uvod u ekološku poljoprivredu</i>, Agronomski fakultet Sveučilišta u Zagrebu, Grafički zavod Hrvatske d. o. o.; 2. Znaor, D. (1996): <i>Ekološka poljoprivreda</i>. Nakladni zavod Globus. Zagreb; 3. Igrc Barčić J. and Maceljski M. (2001): <i>Ekološki prihvatljiva zaštita bilja od štetnika</i>; 4. International Federation of Organic Movement (IFOAM): <i>Basic Standards</i>, 2002; and 5. legal regulations in organic agriculture 		
Additional literature		
scientific and professional papers from relevant journals and databases related to organic agricultural production		

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ECOSYSTEMS IN ECOLOGICAL AGRICULTURE		
Coordinator	Irena Jug	
Collaborators	Boris Đurđević Ružica Lončarić Ljubica Ranogajec Dalida Galović	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (50 L + 25 S)
COURSE DESCRIPTION		
Course aims	Introduce participants to ecosystems in crop and livestock farming, their environmental impact, production limitations, and economic potentials and effects. Through the development of an interdisciplinary project, equip participants with the skills for economic analysis and the creation of a technological production project for an organic farm.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none">1. describe ecosystems, their ecological characteristics, and limitations from the perspective of eco-zones and stress factors;2. interpret the significance of ecological principles for agroecosystems;3. explain the ecophysiological aspects of organic crop production in different ecosystems;4. describe the regional diversity of livestock production, nomadic livestock farming, and mixed livestock systems, and assess the environmental impact and limitations of organic livestock farming;5. conduct an economic analysis of various organic farms considering diversity and the proportion of crop and livestock activities;6. assess the impact of organic and conventional crop and livestock farming on income, profit, and farm profitability;7. develop a project seminar that presents the mentioned agronomic-production, ecological, and economic aspects of organic agriculture and compares them with conventional farming; and8. analyze agronomic practices, crop rotation, fertilization, plant protection, animal nutrition, and product quality from agronomic-production, ecological, and economic perspectives of organic agriculture.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is granted by accumulating the minimum required number of grading points. Grading points are earned based on class attendance (minimum 70%), participation in class activities, seminar paper grades, and partial examination grades. During the semester, students take three partial examinations (in the 5th, 8th, and 11th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Vukadinović, V., Jug, I., Đurđević, B. (2014): <i>Ekofiziologija bilja</i>. Sveučilišni udžbenik, NSS. Osijek.2. Senčić, Đ., Antunović, Z. (2003). <i>Ekološko stočarstvo</i>. Sveučilišni udžbenik, Osijek3. Karić, M. (2002): <i>Kalkulacije u poljoprivredi</i>. Poljoprivredni fakultet Osijek.		
Additional literature		
<ol style="list-style-type: none">1. Sinclair, T. R., Gardner, F. P. (1998): <i>Principles of Ecology in Plant Production</i>. CAB International. Wallingford, UK.2. Kuvačić, N. (2003): <i>Biznis plan ili poduzetnički projekti</i>. Beretin d. o. o. Split		

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BASICS OF ECOLOGICAL PLANT PRODUCTION		
Coordinator	Bojan Stipešević	
Collaborators	Danijel Jug Bojana Brozović Vlado Guberac Sonja Vila	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	L - 65, P - 5, S - 5
COURSE DESCRIPTION		
Course aims	Introduce the participant to the specifics of organic agriculture, its directions worldwide and the differences between them, and address the specifics compared to conventional agriculture in terms of soil tillage, fertilization, crop rotation, and plant protection.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. define the purpose and objectives of organic plant cultivation;2. describe the preparations and transition to organic farming;3. define the aspects of diversity in plant cultivation systems within organic agriculture (crop rotation, soil tillage, fertilization, sowing/planting, maintenance);4. argue the importance of permitted methods for tillage, fertilization, protection, and seed production in organic agriculture; and5. distinguish between technological processes and inputs in organic production.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of grading points. Grading points are obtained based on class attendance (minimum 70%), participation in class activities, seminar work, and grades from partial examinations. During the semester, students take two partial examinations (in the 8th and 15th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination is oral.		
Obligatory literature		
1. Kisić, I, 2014: <i>Uvod u ekološku poljoprivredu</i> , Agronomski fakultet Sveučilišta u Zagrebu, Zagreb, p. 340.		
Additional literature		
1. Znaor, D, 1996: <i>Ekološka poljoprivreda</i> , Globus, Zagreb, p. 469. 2. UREDBA (EU) 2018/848 EUROPSKOG PARLAMENTA I VIJEĆA od 30. svibnja 2018. o ekološkoj proizvodnji i označivanju ekoloških proizvoda te stavljanju izvan snage Uredbe Vijeća (EZ) br. 834/2007. 3. PROVEDBENA UREDBA KOMISIJE (EU) 2020/464 od 26. ožujka 2020. o utvrđivanju određenih pravila za primjenu Uredbe (EU) 2018/848 Europskog parlamenta i Vijeća u pogledu dokumenata potrebnih za retroaktivno priznavanje prijelaznog razdoblja u svrhu prelaska na ekološku proizvodnju, proizvodnje ekoloških proizvoda i informacija koje trebaju pružiti države članice 4. DELEGIRANA UREDBA KOMISIJE (EU) 2020/1794 od 16. rujna 2020. o izmjeni dijela I. Priloga II. Uredbi (EU) 2018/848 Europskog parlamenta i Vijeća u pogledu upotrebe biljnog reprodukcijskog materijala iz prijelaznog razdoblja i neekološkog biljnog reprodukcijskog materijala 5. DELEGIRANA UREDBA KOMISIJE (EU) 2020/427 od 13. siječnja 2020. o izmjeni Priloga II. Uredbi (EU) 2018/848 Europskog parlamenta i Vijeća u pogledu određenih detaljnih pravila proizvodnje za ekološke proizvode 6. Zakon o poljoprivredi, <i>Official Gazette</i> 152/22 7. PRAVILNIK O KONTROLNOM SUSTAVU EKOLOŠKE PO-LJOPRIVREDE (<i>Official Gazette</i> 11/2020, 29 Jan. 2020.)		

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ECOLOGICAL CROP PRODUCTION AND HORTICULTURE		
Coordinator	Ivana Varga	
Collaborators	Tomislav Vinković Mirta Rastija Aleksandar Stanisavljević Prof. Ranko Gantner Vladimir Jukić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75L
COURSE DESCRIPTION		
Course aims	Introduce students to the characteristics of organic production of arable, fruit, and vineyard crops, as well as organic production in horticulture	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. explain the importance of organic production of agricultural crops;2. compare organic crop cultivation with conventional agriculture;3. select the most suitable types or crops of industrial plants, cereals, forage crops, as well as fruits, grapes, vegetables, flowers, and medicinal plants for organic production;4. identify the specific characteristics of agronomic practices and production in organic cultivation compared to conventional production; and5. plan organic production of industrial plants, cereals, forage crops, as well as fruits, grapes, vegetables, flowers, and medicinal plants.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of grading points. Grading points are obtained based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take six partial exams. The Final Examination is mandatory and can be oral or written.		
Obligatory literature		
<ol style="list-style-type: none">1. Batelja Lodeta K., Gugić, J., Čmelik, Z. (2011.): "Ekološka poljoprivreda u Europi i Hrvatskoj s osvrtom na stanje u voćarstvu." <i>Pomologia Croatica</i>.2. Kisić I. (2013): <i>Uvod u ekološku poljoprivredu</i>, Agronomski fakultet Sveučilišta u Zagrebu, Grafički zavod Hrvatske d.o.o.3. Mirošević, N., Karoglan Kontić, J. (2008.): <i>Vinogradarstvo</i>, Nakladni zavod Globus, Zagreb4. Pospišil, A. (2010.): <i>Ratarstvo, I. dio</i>. Zrinski d. d, Čakovec5. Pospišil, M.(2013.): <i>Ratarstvo, II dio – industrijsko bilje</i>. Zrinski d.d, Čakovec6. Pospišil, A., Pospišil, M.(2013.): <i>Ratarstvo: praktikum</i>. Agronomski fakultet Sveučilišta u Zagrebu.7. Senčić, Đ., Antunović, Z., Mijić, P., Baban, M., Puškadija, Z. (2011): <i>Ekološka zootehnika</i>. University textbook. Sveučilište J. J. Strossmayera, Poljoprivredni fakultet u Osijeku, Osijek.8. Šilješ, I., Grozdanić, Đ., Grgesina, I. (1992.): <i>Poznavanje, uzgoj i prerada ljekovitog bilja</i>. Školska knjiga. Zagreb.9. Parađiković, N. (2014): <i>Opće i specijalno povrćarstvo – online skripta</i>, Poljoprivredni fakultet u Osijeku10. Parađiković, N. (2014): <i>Osnove florikulture – interna skripta</i>, Poljoprivredni fakultet Osijek11. Legal regulations in organic agriculture.12. Znaor, D. (1996): <i>Ekološka poljoprivreda</i>. Nakladni zavod Globus. Zagreb13. Znaor, Z. (1996): <i>Ekološka poljoprivreda. Priručnik</i>. Biblioteka Hrvatsko obiteljsko gospodarstvo, Zagreb		
Additional literature		
<ol style="list-style-type: none">1. Butorac, I, Bolf, M. (2000.): <i>Proizvodnja krumpira</i>. Hrvatski zadružni savez, Zagreb.2. Butorac, J. (2009.): <i>Predivo bilje</i>. Kugler, Zagreb.		

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3. Maletić, E., Karoglan Kontić, J., Pejić, I. (2008.): *Vinova loza – ampelografija, ekologija, oplemenjivanje*, Školska knjiga, Zagreb
4. Mirošević, N., Turković, Z. (2003.): *Ampelografski atlas*, Golden marketing i tehnička knjiga, Zagreb

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MECHANIZATION IN ECOLOGICAL AGRICULTURE		
Coordinator	Luka Šumanovac	
Collaborators	Mladen Jurišić Domagoj Zimmer	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (40L + 20P +15S)
COURSE DESCRIPTION		
Course aims	Introduce participants to the description, operating principles, and adjustment of technical systems in organic production, with an emphasis on increasing the efficiency of use, preserving soil fertility, and protecting the environment	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. describe the operating principles and identify the main working components of technical systems for minimal soil tillage, direct sowing, controlled traffic farming (permanent track systems), 'ecological' inter-row cultivators for weed control, and the application of other non-pesticide measures for pest management;2. select the optimal technical-technological solution for agricultural production based on ecological principles;3. describe satellite positioning and automated guidance and control of agricultural machines and devices;4. define ecological principles in the mechanized cultivation of crops; and5. develop and present an assigned topic related to machines and devices used in organic agriculture.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take two partial examinations (in the 9th and 12th weeks of classes). Students are also required to prepare and defend one seminar paper in the 13th week of classes. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination can be oral or written.		
Obligatory literature		
<ol style="list-style-type: none">1. Bajkin, A.: <i>Mehanizacija u povrtarstvu</i>, Poljoprivredni fakultet u Novom Sadu, Novi Sad, 1994.2. Igrc, J., Maceljki, M.: <i>Ekološki prihvatljiva zaštita bilja od štetnika</i>, Sveučilište u Zagrebu, „Zrinski“ Čakovec, Zagreb, 2001.3. Jurišić, M., Plaščak, I.: <i>Geoinformacijski sustavi — GIS u poljoprivredi i zaštiti okoliša</i>, Poljoprivredni fakultet u Osijeku, Osijek, 2009.4. Vojvodić, M., Brkić, D., Lukač, P.: <i>Mehanizacija poljoprivredne proizvodnje I. (Mehanizacija u biljnoj proizvodnji)</i>, Pro-Agrar Zemun-Vinkovci, 1992.5. Znaor, D.: <i>Ekološka poljoprivreda</i>, Nakladni zavod Globus, Zagreb, 1996.6. Scientific and professional papers published in reputable international journals to be used for seminar preparation.		
Additional literature		
<ol style="list-style-type: none">1. Rannertshauer, J.: <i>Thermische Unkrautbekämpfung</i>, KTBL – Arbeitsblatt Nr. 0665, Berlin, 1990.2. Sinclair, T.R., Gardner, F.P.: <i>Principles of Ecology in Plant Production</i>, CAB INTERNATIONAL, Florida, USA, 1998.		

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FERTILIZATION IN ECOLOGICAL AGRICULTURE		
Coordinator	Brigita Popović	
Collaborators	Zdenko Lončarić Vjekoslav Tadić	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	L-55 , P -10 , S-10 , Pr.-1
COURSE DESCRIPTION		
Course aims	Introduce students to the aspects of fertilization in organic crop production, with an emphasis on legislation, the production, and use of fertilizers permitted in organic production, aimed at preserving and improving soil fertility	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. identify the existing legislation related to organic agriculture;2. interpret the importance and role of soil productivity from ecological and fertilization perspectives;3. interpret nutrient management;4. describe the production and properties of liquid and solid manure. Describe composting and the properties of compost;5. describe the importance of permitted minerals and soil conditioning agents in organic agriculture;6. describe agronomic practices in organic agriculture;7. calculate fertilization requirements for organic farming; and8. develop a seminar on nutrient balancing in an organic farm.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take four partial examinations, each conducted one week after the completion of a thematic unit. Students are also required to prepare a seminar paper. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Pravilnik o ekološkoj proizvodnji u uzgoju bilja i u proizvodnji biljnih proizvoda2. Popis dozvoljenih gnojiva i poboljšivača tla u ekološkoj proizvodnji3. Lončarić, Z.; Parađiković, N.; Popović, B.; Lončarić, R.; Kanisek, J. (2015): <i>Gnojidba povrća, organska gnojiva i kompostiranje, tematska cjelina organska gnojiva i kompostiranje</i> (manual)4. Vukadinović, V., Lončarić, Z. (1998): <i>Ishrana bilja</i>. Poljoprivredni fakultet u Osijeku.5. Epstein, E. (1997): <i>The Science of Composting</i>. Technomic, Basel. (book)6. Adams, F. (1984): <i>Soil Acidity and Liming</i>. Number 12 in the series Agronomy. ASA, CSSA, SSSA. Madison, Wisconsin, USA7. Banaj, Đ., Šmrčković, P. (2003): <i>Upravljanje poljoprivrednom tehnikom</i>. Poljoprivredni fakultet u Osijeku. Osijek. (textbook)8. Lončarić, Z. (2005): <i>Analize organskih gnojiva i supstrata</i>. Poljoprivredni fakultet u Osijeku. (interna skripta)		
Additional literature		
<ol style="list-style-type: none">1. Follet, R. F. (1987): <i>Soil Fertility and Organic Matter as Critical Components of Production System</i>. SSSA special publication number 19. SSSA, ASA. Madison, Wisconsin, USA. (knjiga)2. Magdoff, F. R., Tabatabai, M. A., Hanlon, E. A. (1996): <i>Soil Organic Matter: Analysis and Interpretation</i>. SSSA Special3. Publication Number 46. SSSA. Madison, Wisconsin, USA. (book)		

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4. Benčević, K. (1993): *Biokont. Osnove biološkog poljodjelstva*. Poslovna zajednica za stočarstvo. Zagreb. (book)
5. Znaor, D. (1996): *Ekološka poljoprivreda*. Nakladni zavod Globus. Zagreb.(book)

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PLANT PROTECTION IN ECOLOGICAL PRODUCTION		
Coordinator	Karolina Vrandečić	
Collaborators	Mirjana Brmež Vlatka Rozman Renata Baličević Marija Ravlić Tamara Siber	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS	6
	Number of class hours (L + P + S)	(40P + 25V + 10S)
COURSE DESCRIPTION		
Course aims	Introduce graduate students to non-pesticide measures for controlling major disease-causing agents, pests, and weeds in organic or ecological production	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. plan, select, and recommend appropriate measures for protecting crops from disease-causing agents in organic agriculture;2. describe the symptoms of infestation and the biology of the most significant phytoparasitic nematodes and harmful insects;3. assess the state of the agroecosystem through the nematode community by calculating indices used in nematology;4. recommend and describe integrated pest management measures for stored products;5. describe the biology of the most significant weed species and identify them;6. recognize symptoms in the field caused by crop-weed competition;7. describe the principles of action of biological products used for crop protection in organic agriculture; and8. critically and argumentatively comment on an assigned seminar topic.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take four partial examinations. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination is oral.		
Obligatory literature		
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Additional literature		
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ECOLOGICAL ZOO-TECHNIQUE		
Coordinator	Zvonko Antunović	
Collaborators	Pero Mijić Davor Kralik Josip Novoselec Danijela Samac. Željka Klir Šalavardić	
Study year and semester	2nd year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (65L + 10P)
COURSE DESCRIPTION		
Course aims	Introduce students to the technology of organic production for specific types of domestic animals	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. Explain the concept, significance, and current state of organic animal husbandry. Describe the legal regulations in the organic production of animal products.2. Describe the organic rearing and fattening of chickens, organic egg production, and the organic rearing and fattening of turkeys, geese, and ducks, including organic duck fattening in fishponds.3. Describe organic piglet production and organic pig fattening.4. Describe organic lamb production, sheep milk, and meat production. Describe organic goat kid production, goat milk, and meat production.5. Describe organic cow milk and meat production.6. Explain the impact of organic production on the quality of milk, meat, and eggs. Describe the management of solid manure, liquid manure, and slurry, as well as biogas production.7. Organize visits to organic farms and guide the preparation of seminar papers. Present and analyze scientific and professional papers related to recent advancements in organic animal husbandry. Propose seminar paper topics and relevant journals containing scientific and professional articles required for writing them.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance (minimum 70%), participation in class activities, and grades from partial examinations. During the semester, students take three partial examinations (in the 5th, 10th, and 15th weeks of classes). The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Exam is oral.		
Obligatory literature		
1. Senčić, Đ., Antunović, Z., Mijić, P., Baban, M., Puškadija, Z. (2011.). <i>Ekološka zootehnika</i> . Poljoprivredni fakultet u Osijeku, Sveučilište Josipa Jurja Strossmayera u Osijeku.		
Additional literature		
1. Benčević, K. (1993.): <i>Biokont – osnove biološkog poljodjelstva</i> . Poslovna zajednica za stočarstvo, Zagreb. 2. Slijepčević, V. (2002.): <i>Ekološka proizvodnja</i> . Saturn, Zagreb. 3. Znaor, D. (1996.): <i>Ekološka poljoprivreda</i> . Nakladni zavod Globus, Zagreb. 4. Senčić, Đ., Antunović, Z. (2003.): <i>Ekološko stočarstvo</i> . Katava d. d. Osijek.		

ECOLOGICAL AGRICULTURE

University Graduate Study Programme

MARKET AND MARKETING OF ECOLOGICAL PRODUCTS		
Coordinator	Ružica Lončarić	
Collaborators	Igor Kralik Sanja Jelić Milković	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	L – 50, S – 25
COURSE DESCRIPTION		
Course aims	Provide students with the necessary knowledge about the market and marketing of organically produced agricultural products.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none">1. define the role of the market within the scientific system and its characteristics as a scientific discipline;2. describe the concept of the market, its morphology, and structure;3. list and explain market factors;4. analyze and explain the elements of the marketing mix;5. interpret the micro and macro environment of a business;6. explain changes in forms of marketing promotion for organic food, distribution, logistics, and market transparency;7. list and define marketing strategies based on the stages of the life cycle of organic products; and8. select the optimal strategy for modification, diversification, or differentiation of organic products.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance, participation in class activities, assignments during lectures and seminars, seminar evaluation, and grades from partial examinations. During the semester, students prepare an independent seminar paper, which is mandatory. Additionally, students take two partial examinations during the course of the semester. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination can be written or oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Baban, Lj. (1987): <i>Tržište</i> (book), Školska knjiga, Zagreb.2. Kotler, Ph. (1999): <i>Marketing Management</i> (book), Informator, Zagreb.3. Tolušić, Z. (2007): <i>Tržište i distribucija poljoprivredno-prehrambenih proizvoda</i> (book). Poljoprivredni fakultet u Osijeku, Osijek		
Additional literature		
<ol style="list-style-type: none">1. Koester, U. (2020): <i>Foundations of Agricultural Market Analysis and Agricultural Policy</i>, Vahlen Texbooks Munchen2. Cramer, G. L. and Jensen C. W. (1982): <i>Agricultural Economics & Agribusiness</i>. 2nd ed. Montana State University. New York. (book)3. Žaja, M. (1991): <i>Ekonomika proizvodnje</i>, Školska knjiga, Zagreb		

ECOLOGICAL AGRICULTURE

University Graduate Study Programme

MICROORGANISMS IN ECOLOGICAL PRODUCTION		
Coordinator	Gabriella Kanižai Šarić	
Collaborators	–	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (50L + 15P + 10S)
COURSE DESCRIPTION		
Course aims	Introduce graduate students to new insights in soil ecological microbiology, with a special focus on microbial community populations significant in biotechnology and sustainable agriculture	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. explain the role of microorganisms in carbon, nitrogen, and phosphorus transformations in soil;2. describe the role of soil microorganisms in the decomposition of organic residues;3. explain changes in soil microbial activity depending on soil management systems; and4. isolate and identify soil microorganisms.		
Assessment and evaluation of student work during classes		
The right to take the Final Examination is earned by accumulating the minimum required number of assessment points. Assessment points are obtained based on class attendance (minimum 70%), participation in classes and exercises, writing and presenting seminar papers, and grades from partial examinations. During the semester, students take two partial examinations. The Final Examination is mandatory, and a passing grade on the Final Examination is a prerequisite for a passing final grade. The Final Examination is oral.		
Obligatory literature		
<ol style="list-style-type: none">1. Lalević B., Hamidović S., Komlen V. (2020): <i>Građa i funkcija mikroorganizama u agroekosistemu</i>. Agromedicinski fakultet Univerziteta Džemal Bijedić u Mostaru2. Subba Rao, N. S. (1999): <i>Soil Microbiology</i>, Science Pub Inc., USA.3. Đukić, D. A., Jemcev, V. T., Kuzmanova, J. (2007): <i>Biotehnologija zemljišta</i>. Univerzitet u Kragujevcu, Agronomski fakultet u Čačku.		
Additional literature		
<ol style="list-style-type: none">1. Varnam, A.H., Evans, M. G. (ed.) (2000): <i>Environmental Microbiology</i>, Manson Publishing Ltd., London.		

ECOLOGICAL AGRICULTURE

University Graduate Study Programme

PRACTICAL WORK II		
Coordinator	Andrijana Rebekić	
Collaborators	–	
Study year and semester	2nd year, 3rd semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of class hours (L + P + S)	75 (60L + 15S)
COURSE DESCRIPTION		
Course aims	Introduce students to the aspects of fertilization in ecological production, with an emphasis on soil analysis, interpreting results, and calculating fertilization recommendations.	
Course enrollment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to: <ol style="list-style-type: none">1. analyze soil and plants in a laboratory;2. interpret soil analysis results;3. interpret nutrient management;4. calculate nutrient balances and requirements for organic agriculture;5. describe agronomic practices in organic agriculture and set up a field experiment; and6. calculate fertilization requirements for organic cultivation.		
Assessment and evaluation of student work during classes		
Students are expected to engage in two weeks of laboratory and/or fieldwork, fully mastering the methodology of soil and plant analysis, as well as setting up field experiments, and applying fertilizers and conditioners in organic agriculture. Students must maintain a daily work log with detailed descriptions of the tasks performed each day.		
Obligatory literature		
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Additional literature		
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