Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

ELECTIVE COURSES

Agriculture (University Undergraduate Study Programme)

Majors in

AGRICULTURAL ECONOMICS

PLANT PRODUCTION

HORTICULTURE

MECHANIZATION

ZOO-TECHNIQUE

Academic Year 2022-23

June, 2022

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
Igor Kralik	Banking and Credits	Igor Kralik	40	15				6
Tihana Sudarić	Network of Cooperative Societies	Tihana Sudarić	50	15				6
		Krunoslav Zmaić	10					
		Lucija Bencarić		15				
Jelena Kristić	Rural tourism	Jelena Kristić	50	25				6
Jadranka Deže	Agribusiness Management	Jadranka Deže	55					6
		Jelena Kristić		20				
David Kranjac	Agricultural Policy	David Kranjac	40	15				6
		Krunoslav Zmaić	20					
David Kranjac	Means of Foreign Trade Protection	David Kranjac	40	10				6
		Krunoslav Zmaić	10					
		Tihana Sudarić		15				
Ružica Lončarić	Market and food marketing	Ružica Lončarić	50	15				6
		Sanja Jelić Milković		10				
Ljubica Ranogajec	Organization and Costs of Agricultural Production	Ljubica Ranogajec	55			20		6
Ivana Majić	Arable Crops Protection	Ivana Majić	15	10				6
		Jasenka Ćosić	12					
		Karolina Vrandečić	10	3				
		Renata Baličević	25					
Jasenka Ćosić	Protection of vegetables	Jasenka Ćosić	23					6
		Vlatka Rozman	5					
		Edita Štefanić	10	5				
		Ankica Sarajlić	12	10				
		Marija Ravlić	10					
Tomislav Vinković	Vegetable and flower growing	Tomislav Vinković	30			20		6

		Monika Tkalec Kojić		10		20		
		vicaRavnjak		5	10			
Tomislav Vinković	Growing plants in greenhouses	Tomislav Vinković	30					6
		Monika Tkalec Kojić		10		20		
		Boris Ravnjak		5	10			
Aleksandar Stanisavljević	Fruit growing and viticulture	Aleksandar Stanisavljević	35					6
		Mato Drenjančević	10					
		Dejan Bošnjak			5			
		Toni Kujundžić	20		5			
Danijel Jug	Integral projects in plant production	Irena Jug	25					6
		Danijel Jug	25					
		Boris Đurđević	25					
Suzana Kristek	Food microbiology	Suzana Kristek	50					6
		Jurica Jović					25	
Ivana Majić	Plant protection I	Ivana Majić	25					6
		Karolina Vrandečić	20					
		Ankica Sarajlić	5	20				
		Sanda Rašić	5					
Mirta Rastija	Production basics of cereals, cash and forage crops	Manda Antunović	25			5		6
		Gordana Bukvić	10					
		Mirta Rastija	10					
		Ranko Gantner				5		
		Dario Iljkić	10			10		
		Ivana Varga						
Boris Đurđević	Basics of Agro-Ecology	Irena Jug	40					6
		Boris Đurđević	20				15	
Đurđica Kovačić	Management and Recycling of Agricultural Wastes	Tomislav Jurić	5					6
		Ivan Plaščak	5	5				

		Goran Heffer Željko Barač Ivan Vidaković Đurđica Kovačić	15 10	 15	 5 5 10	 	 	
Đuro Banaj	Agricultural Machines Testing	Đuro Banaj Anamarija Banaj	40		25 10			6
Mladen Jurišić	Agricultural Engineering of Vegetables	Mladen Jurišić Irena Rapčan Dorijan Radočaj	10 40	 10		 15		6
Goran Heffer	Mechanical power transmissions of agricultural machines	Goran Heffer Goran Pačarek	39	 30		 6		6
Đuro Banaj	Machines and Devices for Soil preparation and Setting Plantations	Đuro Banaj Tadić Vjekoslav	30 30		 15			6
Tomislav Jurić	Exploitation and Maintenance of Agricultural	Tomislav Jurić Željko Barač Đurđica Kovačić	23 22		 10	 10	 10	6
Darko Kiš	Processing, storage and transport techniques in agriculture	Darko Kiš	50	25				6
Danijela Samac	Ecological Zoo-technique	Zvonko Antunović Pero Mijić Davor Kralik Josip Novoselec Danijela Samac Željka Klir Šalavardić	25 6,5 7,5 4 22			 5 5		6
Dalida Galović	Extension service in zoo technique	Dalida Galović	35	40				6
Davor Kralik	Renewable energy resources	Davor Kralik	55					6

		Đurđica Kovačić	10		10			
Mirjana Baban	Specialized zootechnique	Mirjana Baban Maja Gregić Pero Mijić Zvonko Antunović Josip Novoselec Željka Klir Šalavardić Zlata Kralik Vladimir Margeta Tina Bobić	10 10 8 7 10 10 		 	 4 4 4 4 4		6
Matija Domaćinović	Feeding domestic animals and food production	Matija Domaćinović Ivana Prakatur	45 10		 20			6
Tihomir Florijančić	Hunting and cynology	Tihomir Florijančić Ivica Bošković	35 15		 10		 15	6
Tomislav Vinković	Bio-pollination in Horticulture	Tomislav Vinković Zlatko Puškadija Marin Kovačić Boris Ravnjak	15 8 7 	 5 10	 10 5	 5 5		6
Bojan Stipešević	Basics of Plant Production	Bojan Stipešević Danijel Jug Miro Stošić Bojana Brozović	35 20 10 			 10		6
Darko Kiš	Processing and Storage in Horticulture	Darko Kiš	45		5	25		6
Alka Turalija	Landscape shaping and dendrology	Alka Turalija	55			20		6
Davor Kralik	Zootechnique in the protection of nature and environment	Davor Kralik Đurđica Kovačić	45 20			 10		6
Boris Antunović	Animal wellbeing	Boris Antunović	35			10		6

		Mislav Đidara Pero Mijić Mirjana Baban	20 5 5					
Ivica Bošković	Breeding and keeping pets	Ivica Bošković Dinko Jelkić	40	15		20		6
Vlatka Rozman	Postharvest technology of horticultural	Vlatka Rozman	15					6
		Aleksandar Stanisavljević	15	5				
		Vladimir Jukić	15					
		Mato Drenjančević		5				
		Tomislav Vinković	15	5				

BANKING AND CREDITS		
Coordinator	Igor Kralik	
Collaborators	-	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	5
	Hours (L+S)	55 (40 L + 15 S)
COURSE DESCRIPTION		
Course aims	Educating students on banking and banking operations, as well as monetary policy.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Explain the historical development of the various forms of money over the centuries. 2. Interpret and describe the evolution of monetary systems. 3. Explain the concept of the value of money. 4. Highlight the importance and role of credit and financial institutions. 5. Calculate the credit and monetary potential of banks. 6. Differentiate between various types of banks and banking operations. 7. Define and explain monetary and credit policy.		
Assessment and evaluation of student work during classes		
The right to take the final exam is achieved by accumulating a minimum number of assessment points. These points are earned through class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take two partial exams (in the 7th and 15th weeks of classes). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive overall grade. The final exam is oral.		
Obligatory literature		
1. Srb, V., Matić, B., Marković, B. (2003): Monetarne financije, Ekonomski fakultet u Osijeku, Osijek.		
Additional literature		
1. Božina, L. (2003): Novčana ekonomija (novac i bankarstvo), Fakultet ekonomije i turizma,"Dr. Mijo Mirković", Pula		

NETWORK OF COOPERATIVE SOCIETIES		
Coordinator	Tihana Sudarić	
Collaborators	Krunoslav Zmaić Lucija Bencarić	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	To familiarize students with the importance of cooperatives and other forms of business associations in both national and international contexts.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. To understand the theoretical approach to cooperatives. 2. To explain the ethical and social components of cooperatives. 3. To be familiar with the legal regulations governing cooperative activities. 4. To identify the specific characteristics of cooperatives. 5. To analyze different forms of cooperative activities. 6. To interpret and compare cooperatives in both national and international contexts.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams and seminars. During the semester, students take two partial exams. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. Students present their seminar papers orally for 10 to 15 minutes, using a PowerPoint presentation.		
Obligatory literature		
1. Mataga, Ž. (2009): Etičke vrijednosti i gospodarski značaj zadrugarstva, Golden, Zagreb 2. Mataga Ž. (1993): Poljoprivredno zadrugarstvo Hrvatske. povijest stanje i perspektive (1860-1990). Zadružni savez Hrvatske. Zagreb. 3. Mataga Ž. (1995): Seljak i zadruga. Prosvjeta. Bjelovar. 4. Zakon o zadrugama, Narodne novine, NN 36/95, 67/01, 12/02, 34/11, Zagreb;www.nn.hr 5. Zakon o zadrugama, Narodne novine, NN 34/11, 125/13, 76/14, 114/18, 98/19		
Additional literature		
1. Watkins, W.P.(1986): Cooperative principles. Holyooke books. Manthester. www.zadruge.hr		

RURAL TOURISM		
Coordinator	Jelena Kristić	
Collaborators	-	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S)	75 (50 L + 25 S)
COURSE DESCRIPTION		
Course aims	Provide students with basic knowledge in the field of modern trends in the development of tourism activities based on agricultural farms and agricultural activities. The goal is to recognize rural family tourism farms as economic entities, tax payers, and sources of employment in rural areas.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Describe the definitions of tourism, rural tourism, concepts, and development strategies.
2. Explain the strategic importance of rural tourism development in the national economy.
3. Interpret the limitations of rural tourism development in continental Croatia and opportunities to reduce these limitations.
4. Analyze the prerequisites for development—location factors, attractiveness elements, property arrangements, legal requirements (SWOT analysis).
5. Classify selective forms of tourism in rural areas in accordance with the regional master plan for tourism development in Croatia.
6. Understand and evaluate the factors of demand and supply that influence the development of rural tourism.
7. Confirm the synergistic effect of rural tourism development on the national economy of the Republic of Croatia—economic, social, and sustainable development.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned through class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take two partial exams (in the 7th and 15th week of the course). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is written.

Obligatory literature

1. Ružić, P. (2005): Ruralni turizam, Ins tut za poljoprivredu i turizam Poreč, Pula.

Additional literature

1. Baćac, R. (2011.): Priručnik za bavljenje seoskim turizmom, korak po korak od ideje do uspješnog poslovanja, Ministarstvo turizma Republike Hrvatske, Zagreb.
2. Ružić, P. (2011.): Ruralni turizam Istre, pretpostavke i činitelji razvoja, stanje i perspektiva, Institut za poljoprivredu I turizam Poreč, Zavod za turizam, Pula.

AGRICULTURE ENTREPRENEURSHIP		
Coordinator	Jadranka Deže	
Collaborators	Jelena Kristić	
Study year and semester	Third year, 5th semester	
Number of credits and mode of delivery	ECTS	5
	Hours (L+S)	75 (55 L + 20 S)
COURSE DESCRIPTION		
Course aims	Familiarize students with the assumptions of entrepreneurial activity and equip them for independent entrepreneurial behavior, planning, and entrepreneurial management of agricultural holdings.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Recognize the basic definitions of entrepreneurship (similarities and differences) and its historical development.
2. Describe the significance and impact of the development of entrepreneurship in agriculture on national economic development.
3. Explain the components of the entrepreneurial process.
4. Understand the specifics of entrepreneurial ventures in agricultural production.
5. Interpret the factors influencing the success of agribusiness entrepreneurship, including prejudices and limitations.
6. Plan an entrepreneurial venture and apply physical and financial analysis in the business plan.
7. Develop an idea, identify necessary information (internet databases), and create a business plan.
8. Apply innovation in agricultural production and assess the economic justification of the entrepreneurial venture.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting the minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take three partial exams (in the 5th, 10th, and 15th weeks of classes). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive overall grade. The final exam is written.

Obligatory literature

1. Deže, J., i sur (2008): Agroekonomika, Sveučilišni priručnik, Poljoprivredni fakultet Osijek, OBŽ, Osijek. https://www.obz.hr/hr/pdf/poljoprivredni_info_pult/2010/Agroekonomika.pdf
2. Deželjin, J., i sur. (1999): Poduzetnički menedžment - izazov, rizik i zadovoljstvo. Alinea Zagreb
3. Žanić, V. (2005): Poslovni plan poduzetnika, Ministarstvo gospodarstva RH, Masmedia, Zagreb

Additional literature

1. Hisrich, R.D., Peters M.P., Shepherd, D.A. (2011): Poduzetništvo, sedmo izdanje. McGraw-Hill Companies, MATE d.o.o. Zagreb
2. Kolaković, M. (2006): Poduzetništvo u ekonomiji znanja, Sinergija, Zagreb

MEANS OF FOREIGN TRADE PROTECTION		
Coordinator	David Kranjac	
Collaborators	Krunoslav Zmaić Tihana Sudarić	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	Introduce students to the main tools of foreign trade policy used by agricultural policy makers to protect agricultural producers from external competition, as well as the economic effects of these interventions using protection indicators.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Identify and explain the forms of market entry and principles of business behavior. 2. Describe the main events in the history of Croatian and European agricultural policy. 3. Differentiate and assess the elements of a sales contract. 4. List and explain commodity risks and insurance against commodity risks. 5. Identify key classical import and export transactions.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on attendance (at least 70%), participation in class, tasks during lectures and seminars, seminar evaluation, and grades from partial exams. During the semester, students prepare an independent seminar paper, which is mandatory. Students present the seminar paper orally, lasting 10 to 15 minutes, with a PowerPoint presentation. The schedule for presentations will be arranged in advance. Additionally, students take two partial exams (in the 7th and 15th week of classes). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam may be written or oral.		
Obligatory literature		
1. Baban, Lj., Marijanović, G. (1996) :Međunarodna ekonomija, Ekonomski fakultet, Osijek 2. Šuman, Ž. (1999): Neki problemi globalne trgovine poljoprivrednim proizvodima na pragu 21.stoljeća, Sveučilište u Mostaru, Mostar 3. Gittinger, P.J. (1982): Economic Analysis of Agricultural Projects. Second Edition,John Hopkins University Press, Baltimore and London 4. Josling, T.E., Tangermann, S., Warley, T.K. (1996): Agriculture in the GATT, London 5. Just, R., Hueth, D.L., Schmitz, A. (1982): Applied Welfare Economics and Public Policy, Pretence-Hall, New York		
Additional literature		
1. de Janvry, A., Sadoulet, E. (1995): Quantitative Development Policy Analysis, The John Hopkins University Press, Baltimore and London 2. Tsakok, I. (1990): Agricullltural Price Policy: a Practitioners Guide to Partial Equilibrium Analysis. Cornell University, New York		

ARABLE CROPS PROTECTION		
Coordinator	Ivana Majić	
Collaborators	Jasenka Ćosić Karolina Vrandečić Renata Baličević	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S)	75 (62 L + 13 S)
COURSE DESCRIPTION		
Course aims	Familiarizing students with the principles of plant protection in field crop production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Describe the biology and ecology of pests in field crops, symptoms of infestation, and methods for sample collection.
2. Describe diseases of leaves, roots, and stems (stems), reproductive organ diseases, and seed-borne diseases.
3. Describe the competition between weeds and crops depending on the weed species, number and biomass of weed populations, and the timing of their emergence.
4. Selection of pesticides based on crops and pests, timing and methods of application, and pre-harvest intervals.

Assessment and evaluation of student work during classes

Students must prepare an independent seminar paper, which is mandatory. The seminar paper is presented orally. After the thematic unit is covered, a partial exam will take place. The final grade for students will be based on continuous monitoring of the course (class participation, preparation for lessons, reflective review of the teaching content), the seminar paper, and either a partial or final oral exam.
Attending classes is mandatory according to the Regulations on Studies and Studying at the J.J. Strossmayer University of Osijek. For a passing final grade, students must achieve at least a passing grade ("sufficient") in each of the evaluated components of monitoring and assessment.

Obligatory literature

1. Ivezić, M. (2008): Entomologija – kukci i ostali štetnici u ratarstvu, Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku
2. Maceljski, M. (2002): Poljoprivredna entomologija. Zrinski Čakovec
3. Hulina, N. (1998): Korovi. Školska knjiga, Zagreb
4. Jovičević, B., Milošević, M. (1990.): Bolesti semena. Dnevnik, Novi Sad
5. Hanf, M. (1983): The Arable Weeds of Europe. BASF Aktiengesellschaft, Ludwigshafen.
6. Kovačević, J. (1976): Korovi u poljoprivredi. Nakladni zavod Znanje, Zagreb
7. Glasilo biljne zaštite

Additional literature

1. Skender, A. et al. (1998): Sjemenje i plodovi poljoprivrednih kultura i korova na području Hrvatske. Sveučilište J.J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku, 224.
2. Wallwork, H. (1996.): Cereal Root and Crown Diseases
3. Roelfs, A.P., Singh, R.P., Saari, E.E. (1992.): Rust Diseases of Wheat: Concepts and Methods of Disease Management. . CIMMYT, Mexico
4. Landolt, E. (1977): Ökologische Zeigerwerte zur Schweizer Flora Geobotanischen Institutes der ETH, Stiftung Rübel, Zürich, 64. Heft.

PROTECTION OF VEGETABLE		
Coordinator	Jasenka Ćosić	
Collaborators	Vlatka Rozman Edita Štefanić Ankica Sarajlić Marija Ravlić	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	Familiarizing students with the principles of plant protection in vegetable growing.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Describe the symptoms, biology, and ecology of disease-causing agents and harmful insects on vegetables.
2. Explain the methodology of sampling.
3. Describe the physical-chemical properties and toxicology of plant protection products.
4. Calculate and prepare plant protection products for application.
5. Identify the most important weeds in vegetables and describe their biology and ecology.
6. Compare different strategies and select a control program for disease agents, pests, and weeds in vegetables.
7. Describe the principles and methods of storing fresh and dried vegetables.
8. Comment, argue, and critically analyze the assigned topic of the seminar paper.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class, and grades from seminars and partial exams. During the semester, students take five partial exams. The final exam is mandatory, and a positive grade in the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Kovačević, J. (1976): Korovi u poljoprivredi. Nakladni zavod Znanje, Zagreb.
2. Baličević R., Ravlić M. (2013): Fitofarmacija, interna skripta za studente Poljoprivrednog fakulteta u Osijeku.
3. Bagi, F., Bodnar, K. (2012): Fitomedicina. Univerzitet u Novom Sadu, Poljoprivredni fakultet.
4. Maceljski, M. i sur. (2004): Štetočinje povrća. Zrinski Čakovec.
5. Maceljski, M. i sur. (1997): Priručnik iz zaštite bilja. Zavod za zaštitu bilja u poljoprivredi i šumarstvu R. Hrvatske, Zagreb.
6. Tadejević, V., Jakovlić, V. (1986): Poznavanje robe s osnovama tehnologije i nauke o ishrani. Zagreb: 1-750.

Additional literature

1. Altieri, M.A., Liebman, M. (1988): Weed Management in Agroecosystems: Ecological approaches. CRC Press, Inc. Boca Raton, Florida.
2. Ljubisavljević, M. (1985): Prehrambeni proizvodi i pića. Beograd.1-565.
3. Glasilo biljne zaštite: Pregled sredstava za zaštitu bilja u Hrvatskoj. Izd. HDBZ, Zagreb

Vegetable and flower growing		
Coordinator	Tomislav Vinković	
Collaborators	Monika Tkalec Kojić Boris Ravnjak	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S+E)	75 (35 L + 20 S + 20 E)
COURSE DESCRIPTION		
Course aims	Introduce students to vegetable and floriculture species. Present traditional and modern production methods and familiarize students with the basic principles of vegetable and floriculture production.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Identify and describe vegetable and floricultural crops. 2. Recognize traditional and modern production methods. 3. Apply basic rules and principles for fertilization, protection, harvesting, and transportation of vegetable and floricultural species. 4. Select and distinguish specific interventions and care measures during the production process of a given crop. 5. Recognize diseases and pests in vegetables and flowers and implement control measures – biological control. 6. Predict yields and ensure the good quality of fruits and flowers.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by accumulating a minimum number of points. Points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take two partial exams (in the 7th and 15th week of classes). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
1. Parađiković, N. (2014): Opće i specijalno povrćarstvo – online skripta, Poljoprivredni fakultet u Osijeku 2. Welbaum, G.E. (2015): Vegetable production and practices, CAB International, Wallingforth, Oxfordshire, UK 3. Parađiković, N., Tkalec Kojić, M., Zeljković, S., Kraljičak, J., Vinković, T. (2018): Osnove florikulture, Poljoprivredni fakultet u Osijeku		
Additional literature		
1. Ingram, D., Vince-Prue, D., Gregory, P. (2008): Science and the Garden, University of Cambrige, UK, Royal Horticultural Society, UK, The Scotish Crop Research Institute 2. Vinković, T., Popović, B., Stošič, M., Lončarić, Z., Kristek, S., Ivezić, V., Tkalec Kojić, M., Jović, J., Ravnjak, B. (2019.): Okolišno prihvatljiva proizvodnja povrća, Fakultet agrobiotehničkih znanosti Osijek		

FRUIT GROWING AND VITICULTURE		
Coordinator	Aleksandar Stanisavljević	
Collaborators	Dejan Bošnjak	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L+S+E)	75 (65 L + 10 E)
COURSE DESCRIPTION		
Course aims	To familiarize students with the methodological units of the biology and technology of fruit tree cultivation and fruit processing. To familiarize students with the methodological units of the biology and technology of grapevine cultivation and grape processing into wine.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Describe, list, define – Systematics, ecology, morphology, phenophases of development, fertility, and reproduction of fruit trees. 2. Describe, list, define – Systematics, ecology, morphology, phenophases of development, fertility, and reproduction of grapevines. 3. Perform, calculate, describe – Fertilization, inter-row cultivation, protection from diseases and pests, trellising, and pruning. 4. Understand – Harvesting of fruits and grapes, storage of fruits, grape processing.		
Assessment and evaluation of student work during classes		
Students are expected to attend classes regularly and actively participate in tasks during lectures. Throughout the semester, two partial exams will be held. The final exam is oral. Students who successfully complete their obligations during the semester may be exempt from taking the final exam. It is recommended that students take notes during lectures and prepare for exams using the required literature. During lectures, PowerPoint presentations will be used to help explain the content discussed. The presentations will be available to students in printed form (handouts). In determining the final grade, continuous monitoring of the course (class participation, preparation for lessons, reflective review of the content), continuous monitoring and knowledge testing (partial exams), and the final oral exam will be considered. Attending partial exams is not mandatory, and attending the final exam is not required if the student passes the partial exams (which is why different weights are assigned to the grade). Attendance is mandatory according to the Regulations on Studies and Studying at the J.J. Strossmayer University of Osijek. If a student misses more than 30% of the teaching hours (more than 4 times), they lose the right to receive a signature.		
Obligatory literature		
1. Jemrić, Tomislav (2007): Cijepljenje i rezidba voćaka, Naklada Uliks, Rijeka 2. Licul, R., Premužić, D. (1979): Praktično vinogradarstvo i podrumarstvo, Znanje, Zagreb 3. Mirošević, Nikola (1996): Vinogradarstvo, Nakladni zavod Globus, Zagreb		
Additional literature		
1. Westwood, M. N. (1993): Temperature-zone pomology: physiology and culture, Timber Press, Inc., USA, 2. Miljković, Ivo (1991): Suvremeno voćarstvo, Znanje, Zagreb (knjiga) 3. https://fruit.cornell.edu/ 4. https://www.canr.msu.edu/fruit/ 5. https://www.fao.org/home/en 6. https://www.freshplaza.com/europe/		

INTEGRAL PROJECTS IN PLANT PRODUCTION		
Coordinator	Danijel Jug	
Collaborators	Irena Jug Boris Đurđević	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L)	75 (75 L)
COURSE DESCRIPTION		
Course aims	Introducing students to practical examples from various production systems used to solve local problems in crop production (agronomic, economic, technological, and ecological), with a special focus on fertilization strategies and management, emphasizing the link between livestock and arable farming, soil protection and management (soil conservation, erosion control, water protection, landscape protection), as well as crop protection and production planning.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Differentiate between traditional and modern food production technology methods. 2. Compare modern and traditional agricultural production. 3. Predict the impact of agro-technology on the environment and changes in agro-ecosystems. 4. Assess the influence of agro-technology on agricultural production. 5. Analyze the production cycle from primary production to the final product. 6. Use GIS tools for the analysis and planning of agricultural production.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of points. Points are awarded based on class attendance (at least 70%), class participation, and grades from partial exams. During the semester, students take three partial exams (in weeks 5, 10, and 15 of the course). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
1. Jug I., Jug D., Brozović B., Vukadinović V., Đurđević B. (2022): Osnove tloznanstva i biljne proizvodnje. Sveučilište Josipa Jurja Strossmayera u Osijeku, Fakultet agrobiotehničkih znanosti Osijek (FAZOS), Osijek, Hrvatska, str. 527. ISBN: 978-953-8421-00-6. 2. Jurišić M., Plaščak I. (2009): Geoinformacijski sustavi GIS u poljoprivredi i zaštiti okoliša, Poljoprivredni fakultet Osije 3. Jug D., Birkás M., Kisić I. (2015): Obrada tla u agroekološkim okvirima. Sveučilišni udžbenik. Hrvatsko društvo za proučavanje obrade tala (HDPOT), Osijek, Hrvatska, str. 275. ISBN: 978-953-7871-48-2.		
Additional literature		
1. Jug D., Jug I., Vukadinović V., Đurđević B., Stipešević B., Brozović B. (2017): Konzervacijska obrada tla kao mjera ublažavanja klimatskih promjena. Hrvatsko društvo za proučavanje obrade tala (HDPOT), Osijek, Hrvatska, str. 176. ISBN: 978-953-7871-61-1. 2. Kisić I., (2012): Sanacija onečišćenoga tla. Udžbenik sveučilišta u Zagrebu		

FOOD MICROBIOLOGY		
Coordinator	Suzana Kristek	
Collaborators	Jurica Jović	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + S + E)	75 (50 L + 15 E + 10 S)
COURSE DESCRIPTION		
Course aims	Familiarize participants with the wide range of microbes involved in food spoilage and food poisoning caused by microorganisms (bacteria causing spoilage, fermentative bacteria, probiotic and pathogenic bacteria, molds, yeasts, and parasitic protozoa).	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Differentiate groups of microorganisms originating from food. Understand the parameters that affect the growth, survival, and death of microorganisms in food. Growth and reproduction of microorganisms in food. 2. Know which beneficial and pathogenic microorganisms are present in meat and meat products. 3. Distinguish lactic acid bacteria from yeasts in dairy product production. 4. Know which microorganisms are involved in the fermentation of plant products. 5. Use microorganisms as food and organic fertilizer (algae). 6. Understand the basics of microbiology of animal feed, water microbiology, and microbiological and industrial processes (aerobic and anaerobic processes) in food processing.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), active participation in class, and grades from partial exams. During the semester, students take two partial exams. The final exam is mandatory, and a positive grade in the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
1. Duraković, S. (1991.). Prehrambena mikrobiologija, Medicinska naklada. 2. Duraković, S., Delaš, F., Duraković, L. (2002.). Moderna mikrobiologija namirnica, Zagreb.		
Additional literature		
1. Duraković, S., Duraković, L. (2000.). Specijalna mikrobiologija, Zagreb.		

GROWING PLANTS IN GREENHOUSES		
Coordinator	Tomislav Vinković	
Collaborators	Boris Ravnjak Monika Tkalec Kojić	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + S + E)	75 (30 L + 30 E + 15 S)
COURSE DESCRIPTION		
Course aims	The goal is to introduce students to plant production in protected environments and the construction of greenhouses and tunnels, focusing on the selection of structures, materials, and equipment. This includes choosing and modeling growing systems in soil, substrates (of different compositions), container-based cultivation, and hydroponic systems, both with and without substrates. Additionally, the course covers sterilization and disinfection of spaces, as well as the application of biological methods in crop protection.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Identify and describe the types of protected spaces. 2. Recognize the characteristics of location and other factors when establishing protected spaces. 3. Choose the type of protected space depending on the selected production technologies. 4. Manage modern production systems and control units. 5. Organize the production process and maintain protected spaces.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of grading points. Grading points are earned based on class attendance (minimum 70%), class participation, and grades from partial exams. During the semester, students take two partial exams (in the 7th and 15th week of classes). The final exam is mandatory, and a positive grade in the final exam is a prerequisite for a positive overall grade. The final exam is oral.		
Obligatory literature		
1. Parađiković,N. (2009.): Zaštićeni prostori plastenici – staklenici, Poljoprivredni fakultet Osijek, Osječko-baranjska županija, Osijek 2. Castila, N. (2013): Greenhouse technology and management 2nd edition, CAB International, Wallingforth, Oxfordshire, UK 3. Goldammer, T. (2019): Greenhouse Management, Apex publishers, Centreville, Virginia, USA 4. Welbaum, G.E. (2015): Vegetable production and practices, CAB International, Wallingforth, Oxfordshire, UK		
Additional literature		
1. Vinković, T., Popović, B., Stošič, M., Lončarić, Z., Kristek, S., Ivezić, V., Tkalec Kojić, M., Jović, J., Ravnjak, B. (2019.): Okolišno prihvatljiva proizvodnja povrća, Fakultet agrobiotehničkih znanosti Osijek 2. Znanstveni i stručni radovi iz relevantnih časopisa i baza vezani za proizvodnju u zaštićenim prostorima		

BIO-POLLINATION IN HORTICULTURE		
Coordinator	Tomislav Vinković	
Collaborators	Zlatko Puškadija Marin Kovačić Boris Ravnjak	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + S + E)	75 (30 L + 25 E + 20 S)
COURSE DESCRIPTION		
Course aims	Introduce students to the principles of biopollination in fruit and vegetable crops in open fields and protected environments. Present the biology and technology of breeding and maintaining natural pollinators—honeybees and bumblebees—and familiarize students with the technology of applying them in pollination within agroecosystems.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Describe the anatomical structure of bees and bumblebees. 2. Apply biopollination in horticultural crop plantations. 3. Differentiate and list the advantages of using biopollination. 4. Understand the structure of flowers and inflorescences. 5. Select the type of pollinator depending on the type of plantation. 6. Apply correct technological procedures in plant production. 7. Organize the production process with the application of biopollination. 8. Maintain and breed natural pollinators.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (minimum 70%), class activities, and grades from partial exams. During the semester, students take two partial exams (in the 7th and 15th weeks of classes). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
1. Parađiković, N. (2014): Osnove florikulture – interna skripta, Poljoprivredni fakultet Osijek 2. Parađiković, N., Tkalec Kojić, M., Zeljković, S., Kraljičak, J., Vinković, T. (2018): Osnove florikulture, Poljoprivredni fakultet u Osijeku 3. Parađiković, N. (2014): Opće i specijalno povrćarstvo – online skripta, Poljoprivredni fakultet u Osijeku		
Additional literature		
1. Ingram, D., Vince-Prue, D., Gregory, P. (2008): Science and the Garden, University of Cambrige, UK, Royal Horticultural, Society, UK, The Scotish Crop Research Institute 2. Znanstveni i stručni radovi iz relevantnih časopisa i baza vezani za proizvodnju povrćarskih I voćarskih kultura.		

PROCESSING AND STORAGE IN HORTICULTURE		
Coordinator	Darko Kiš	
Collaborators	-	
Study year and semester	Third year, 5th semester	
Number of credits and mode of delivery	ECTS	3
	Hours (L + E)	40 (35 L + 5 E)
COURSE DESCRIPTION		
Course aims	The goal is to enable undergraduate students to master the material and acquire knowledge in order to achieve optimum results in the processing and preservation of agricultural products in horticulture.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. List the basic tasks of storage.
2. Describe the factors that affect the viability of agricultural products.
3. State the physical properties of agricultural products.
4. Differentiate between types of storage and equipment used in them.
5. Differentiate the basic properties of humid air.
6. Recognize the basic types of dryers.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%) and participation in class activities. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Ritz, Josip (1997): Uskladištavanje ratarskih proizvoda. PBI d.o.o. Zagreb
2. Babić, Ljiljna; Babić Mirko (2000): Sušenje i skladištenje. Poljoprivredni fakultet, Novi Sad
3. Šumanovac, Luka, Slavko Sebastijanović, Darko, Kiš (2011): Transport u poljoprivredi, Poljoprivredni fakultet u Osijeku, Osijek
4. Lovrić, T., Vlasta Piližota (1994.): Konzerviranje i prerada voća i povrća. Nakladni zavod Globus, Zagreb

Additional literature

1. I Zvonko Katić (1997): Sušenje i sušare u poljoprivredi, Multigraf, Zagreb
2. Petz, B. (1985.): Osnovne statističke metode za nematematičare. SNL, Zagreb..

POSTHARVEST TECHNOLOGY OF HORTICULTURAL		
Coordinator	Vlatka Rozman	
Collaborators	Aleksandar Stanisavljević Vladimir Jukić, Mato Drenjančević Tomislav Vinković Toni Kujundžić Dejan Bošnjak	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	3
	Hours (L + S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	Detailed introduction of students to the techniques and specifics of post-harvest technologies in horticulture.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Analyze the quality of the harvested raw material.
2. Describe the processing of fruits, grapes, vegetables, and medicinal plants.
3. Break down the causes of spoilage in fresh raw materials and processed products.
4. Differentiate the specifics of producing wine, brandy, and liqueurs.
5. Determine the harvest date for fruits, grapes, vegetables, flowers, and medicinal plants.
6. Define the properties of water, air, and products required for processing and storage.
7. Define the physical-chemical properties of fruit, vegetable, floricultural, and medicinal crops during processing and storage.
8. Compare equipment, processes, and facilities for processing, drying, storage, and transport.
9. Choose and apply the correct preservation and processing technology.
10. Sort according to market requirements and preservation and processing processes.
11. Solve problems during storage and select the optimal technology to prevent them.
12. Manage the harvesting, storage, and processing processes of products.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%) and participation in class activities. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Barrett, D.M., Somogyi, L.P., Ramaswamj, H.S.(2004.): Processing fruits: Science and Technology,CRC PrILIc.
2. Lovrić, T., Piližota,V.(1994.): Konzerviranje i prerada voća i povrća,Nakladni zavod Globus.
3. Parađiković,N. (2009.): Zaštićeni prostori plastenici – staklenici, Poljoprivredni fakultet Osijek.
4. Mirošević, N., Karoglan Kontić, J. (2008.): Vinogradarstvo, Golden marketing, Zagreb.
5. Banić, M. (1997.): Voćne rakije i likeri,Gospodarski list, Zagreb.
6. Lešić, R., Borošić, J., Buturac, M., Ćustić, M., Poljak, ., Romić, D. (2002.): Povrćarstvo. Zrinski d.d., Čakovec:1-627

Additional literature

1. Korunić,Z. (1990.): Štetnici uskladištenih poljoprivrednih proizvoda, biologija, ekologija i suzbijanje. Gospodarski list, Zagreb:starnice: 1-220. (knjiga)
2. Ritz, J. (1989.): Uskladištenje krumpira. Zagreb:stranice: 1-50. (knjiga)
3. Zakon o hrani (NN 18/23)
4. Pravilnik o proizvodnji, označivanju, zaštićenim oznakama, stavljanju u promet i službenim kontrolama jakih alkoholnih pića (NN 76/22).

MANAGEMENT AND RECYCLING OF AGRICULTURAL WASTES		
Coordinator	Đurđica Kovačić	
Collaborators	Ivan Plaščak, Goran Heffer, Tomislav Jurić, Željko Barač, Ivan Vidaković	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + E + S)	75 (35 L + E 20 + 20 S)
COURSE DESCRIPTION		
Course aims	Familiarize students with the types of agricultural waste, their harmful impact on the environment, and the methods of disposal.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Define the concept of waste and its sources of origin. 2. Describe the strategic guidelines and goals of waste management. 3. Identify and rank agricultural waste. 4. Compare various technologies and choose the best ones for waste disposal. 5. Present a biogas plant. 6. Understand the methods of recycling waste material. 7. Comment, argue, and critically discuss a given topic related to waste management.		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%) and participation in class activities. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral or written.		
Obligatory literature		
1. Kalambura, S., Krička, T., Kalambura, D. (2011): Gospodarenje otpadom, Veleučilište Velika Gorica, Velika Gorica		
Additional literature		
1. Važeći propisi iz područja gospodarenja otpadom u RH 2. Najnoviji znanstveni i stručni radovi objavljeni iz područja gospodarenja otpadom		

AGRICULTURAL MACHINES TESTING		
Coordinator	Đuro Banaj	
Collaborators	Anamarija Banaj	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + E)	75 (40 L + E 35)
COURSE DESCRIPTION		
Course aims	Familiarize students with the importance of testing agricultural machinery, as well as with regulations and standards. Organization of testing, methods of measurement, data processing, comparison, and presentation. Methods of testing power machines and engines in the laboratory and under operational conditions. Testing strategies for agricultural machinery in field crop production according to European Union regulations.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. List the basic tasks of technical systems on agricultural machinery.
2. Describe the factors that affect the proper operation of individual systems.
3. Identify the basic methods for testing agricultural machinery.
4. Differentiate and interpret the obtained measurement results for technical systems, types, and additional equipment on them.
5. Select technical systems based on the results of testing in the application of specific cultivation technologies.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on attending classes (minimum 70%), participation in class activities, and grades from partial exams. During the semester, students take partial exams. The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final grade. The final exam is written.

Obligatory literature

1. Banaj, Đ., Tadić, V., Banaj Željka, Lukač., P. (2013): Unapređenje tehnike aplikacije pesticida, Poljoprivredni fakultet u Osijek, Osijek,
2. Lukač, P., Pandurović, T. (2011): Strojevi za berbu voća i grožđa, Poljoprivredni fakultet u Osijeku, Osijek,
3. Zimmer, R., Košutić, S., Zimmer, D. (2009.): Poljoprivredna tehnika u ratarstvu, Sveučilišta J. J. Strossmayera u Osijeku,
4. Banaj, Đ., Šmrčković P. (2003): Upravljanje poljoprivrednom tehnikom, Poljoprivredni fakultet, Osijek,
5. Standardi (ASAE, HRN i ISO, EU-EN, EN 13790 I i II) iz područja poljoprivrednih strojeva,
6. Mirko Vuković (2006); Međunarodni sustav jedinica SI, 8 idanje, Državni zavod za mjeriteljstvo.

Additional literature

1. D. Brkić, M. Vujčić, L. Šumanovac, T. Jurić, P. Lukač, D. Kiš, D. Knežević (2005): „Eksploatacija poljoprivrednih strojeva", Poljoprivredni fakultet u Osijeku, Osijek 2005., ISBN 631.316(075.8)
2. Ercegović, Đ., Raičević, D. (2003): Mehanizmi poljoprivrednih mašina, Poljoprivredni fakultet Univerziteta u Beogradu, Beograd

AGRICULTURAL ENGINEERING OF VEGETABLES		
Coordinator	Mladen Jurišić	
Collaborators	Irena Rapčan Dorijan Radočaj	
Study year and semester	Third year, 5th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + E + S)	75 (50 L + E 15 + S 10)
COURSE DESCRIPTION		
Course aims	To familiarize the students with the key technological and technical factors of modern vegetable cultivation (Integrated, Biodynamic, and Organic methods) and to train them to independently utilize all available scientific and professional achievements in vegetable production. Additionally, to introduce students to the development and use of expert systems in vegetable cultivation.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Describe the general and economic importance of vegetable crops, present the basic systematics of vegetable crops, and identify the agro-ecological factors of cultivation (requirements of individual vegetable crops regarding climatic conditions and soil). Present and explain expert systems in vegetable cultivation.
2. Describe and explain the cultivation of seedlings and vegetable production in protected environments.
3. Interpret the agrotechnics of vegetable crops (cabbage, onion, and rarer crops from the Brassicaceae family) – conventional, organic, and sustainable production (crop rotation, sowing, soil preparation for vegetable crops, cultivation systems, fertilization, protection from diseases, pests, and weeds, as well as harvesting and technological quality).
4. Interpret the agrotechnics of vegetable crops (tomato, pepper, carrot, celery) and rarer crops from the Solanaceae and Umbelliferae families – conventional, organic, and sustainable production (crop rotation, sowing, soil preparation, cultivation systems, fertilization, protection from diseases, pests, and weeds, as well as harvesting and technological quality).
5. Interpret the agrotechnics of vegetable crops (spinach, beetroot, beans, peas) and rarer crops from the Chenopodiaceae and Papilionaceae families – conventional, organic, and sustainable production (crop rotation, sowing, soil preparation, cultivation systems, fertilization, protection from diseases, pests, and weeds, as well as harvesting and technological quality).
6. Describe and interpret the basics of agrotechnics and identify alternative methods of cultivation for rarer vegetable and perennial crops (okra, sweet potato, asparagus, artichoke).
7. Prepare and present a seminar paper on one family (all known cultivation methods for a given family).

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting the minimum number of assessment points. Assessment points are earned based on attendance (at least 70%), classroom activities, and the results of partial exams. During the semester, students take partial exams. The final exam is mandatory, and a passing grade in the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Jurišić M. (2009): AgBase – Priručnik za uzgoj bilja, II. Tehnologija (agrotehnika) važnijih povrćarskih kultura, MPŠVG RH - VIP projekt VII-5-16/07, Poljoprivredni fakultete, Osijek.
2. Jurišić M. (2015): AgBase – Priručnik za uzgoj bilja IV. Opća načela i agrotehnika (tehnologija) organskog uzgoja bilja – povrća, Poljoprivredni fakultet Osijek.

Additional literature

1. Lešić Ružica, Borošić J., Buturac I., Herak-Ćustić Mirjana, Poljak M., Romić D. (2004): Povrćarstvo, Zrinski d. d.
2. Todorović J., Lazić B., Komljenović I. (2003): Ratarsko – povrtarski priručnik, Laktaši, 2003.
3. Todorović J., Lazić B., Komljenović I. (2003): Ratarsko – povrtarski priručnik, Laktaši, 2003.
4. Lazić Branka, Ilić Z., Đurovka M. (2013) Organska proizvodnja povrća, Centar za organsku proizvodnju, Selenča – Novi Sad

MECHANICAL POWER TRANSMISSIONS OF AGRICULTURAL MACHINES		
Coordinator	Goran Heffer	
Collaborators	Goran Pačarek	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + E + S)	75 (39 L + E 30 + S 6)
COURSE DESCRIPTION		
Course aims	Introduce students to mechanical power transmissions, the basic components of transmission systems, and their application on agricultural machinery. Develop students' skills in applying engineering methods for the analysis of mechanical devices.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Determine kinematic quantities for the rotation of a rigid body around a fixed axis. 2. Calculate factors and sizes of cylindrical gear transmissions. 3. Calculate factors and sizes of bevel and worm gear transmissions. 4. Calculate factors and sizes of worm gear transmissions. 5. Explain the operation of screw and hypoid gears. 6. Analyze factors and sizes of belt transmission for given operating conditions. 7. Analyze factors and sizes of chain transmission. 8. Present basic configurations of planetary transmissions.		
Assessment and evaluation of student work during classes		
Students are expected to actively participate in classes, applying computational and design methods during lectures and exercises. Each student is required to independently create a project in the form of a design program. After the lectures and exercises in a group of related topics, knowledge will be assessed through partial exams. During the semester, three written and oral partial exams will be held. Alternatively, a student can take the exam during the regular exam periods if they achieve passing grades from other required activities.		
Obligatory literature		
1. Vujčić, M.: Inženjerska mehanika I, Poljoprivredni fakultet Osijek 2012/2013. 2. Opalić, M., (1998): Prijenosnici snage i gibanja, Hdesk, Zagreb. 3. Decker, K.H. (1987, 2006): Elementi strojeva, Tehnička knjiga, Zagreb		
Additional literature		
1. Oberšmit, E., Ozubljenja i zupčanici, (1987): Liber, Zagreb. 2. Oberšmit, E., Krasnik, A., (1981): Prijenosnici snage – zbirka rješenih zadataka, Tehnička knjiga, Zagreb. 3. Tanasijević, S. (1987): Mehanički prenosnici, Naučna knjiga, Beograd. 4. Looman, J. (1998): Zahnradgetriebe, Springer-Verlag, Heidelberg.		

MACHINES AND DEVICES FOR SOIL PREPARATION AND SETTING PLANTATIONS		
Coordinator	Đuro Banaj	
Collaborators	Tadić Vjekoslav	
Study year and semester	Third year, 6th semester	
Number of credits and mode of delivery	ECTS	6
	Hours (L + E + S)	75 (39 L + E 30 + S 6)
COURSE DESCRIPTION		
Course aims	To familiarize students with the methods and operation of machines and devices for land preparation and systematization for establishing plantations on sloped and flat terrains. The content enables participants to gain a detailed understanding of the machines and devices, including their design, components, working theory, adjustments, and application.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

Upon successfully completing the module, students will be able to:

1. Explain in detail the principles of operation of soil preparation machines for planting fruit trees and grapevines, as well as the method of terracing. The selection of tractors in fruit and vine production. Perform the most important practical adjustments of self-propelled and attached machines for soil preparation for planting vine cuttings and fruit tree seedlings on sloped and flat terrains.
2. Develop and present a given topic from the field of machines and devices in fruit growing and viticulture.
3. Calculate important operational parameters of agricultural machinery in fruit and viticulture production.

Assessment and evaluation of student work during classes

The right to take the final exam is earned by collecting the minimum number of assessment points. Assessment points are earned based on attendance (at least 70%), classroom activities, and the results of partial exams. During the semester, students take partial exams. The final exam is mandatory, and a passing grade in the final exam is a prerequisite for a positive final grade. The final exam is written or oral.

Obligatory literature

1. Lukač, P, Knežević,D.: Strojevi za sistemati zaciju obradu tla u nasadima,Vinkovci,2011.
2. Brčić,J .i suradnici: Mehanizacija u voćarstvu i vinogradarstvu,Zagreb, 1995
3. Lukač, P., Šumanovac, L.: Zbirka rješenih zadataka iz mehanizacije biljne proizvodnje, Vinkovci, 2001.
4. Zimmer, R. i sur.: Mehanizacija u ratarstvu, Poljoprivredni fakultet u Osijeku, Osijek, 1997. Zimmer, R. i sur.: Poljoprivredna tehnika u ratarstvu, Poljoprivredni fakultet u Osijeku, Osijek, 2009.
5. Vojvodić, M., Brkić, D., Lukač, P.: Mehanizacija poljoprivredne proizvodnje I. (Mehanizacija u biljnoj proizvodnji), “Pro-Agrar” Zemun-Vinkovci, 1992.
6. Znanstveno-stručni radovi objavljeni u referentnim međunarodnim časopisima koji će poslužiti za pripremu seminara.
7. Lukač,P., Pandurović,T.: Strojevi za berbu voća i grožđa,Osijek,2011

Additional literature

1. Brčić, J.: Mehanizacija u biljnoj proizvodnji, „Školska knjiga“, Zagreb, 1987.
2. Brčić, J.: Mehanizacija u povrćarstvu, Fakultet poljoprivrednih znanosti , Zagreb, 1991.
3. Zimmer, R., Košutić, S., Kovačev, I., Zimmer, D.: Integralna tehnika obrade tla i sjetve, Poljoprivredni fakultet u Osijeku. 2014.

AGRICULTURAL POLICY		
Coordinator	David Kranjac	
Collaborators	Krunoslav Zmaić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (60L + 15S)
COURSE DESCRIPTION		
Course aims	Acquaint applicants with the central economic problems of agriculture and enable understanding of the basic actions of agricultural political actors at all levels through the application of modern means, instruments and measures of agrarian policy, especially practical skills and knowledge from current international relations in agriculture.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Identify and justify basic economic laws in the creation of agricultural and rural policy measures in the different economic systems
2. Distinguish and evaluate the conditions of agricultural activity
3. List and explain basic elements of agrarian policy
4. Identify key socio - economic advantages and shortcomings in the design of agrarian - political programmes and institutional frameworks
5. Evaluate and critically discuss the results and effectiveness of agrarian - political measures through current laws
6. Independently and/or as a team, create and present a proposal for an agrarian - political program with arguments at the local and national level

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance (minimum 70%), activities and tasks during the class, , evaluation of seminars and grades from partial exams. During the semester, students prepare independent seminar work that is obligatory. Students present their seminar work orally in duration of
10 to 15 minutes with PowerPoint presentation. The presentation schedule will be agreed in advance. In addition, students take two partial exams (at weeks 7 and 15). The final exam is mandatory, and a positive assessment from the final exam is a prerequisite for a positive final grade. The final exam is written or oral.

Obligatory literature

1. Petrač, B. (2002): Agroekonomika, Ekonomski fakultet u Osijeku, Osijek
2. Baban Lj. (1999): Ogledi iz agrarne ekonomije, Ekonomski fakultet u Osijeku, Osijek
3. Franić, Ramona, Kumrić, Ornella (2008.-2009.): Agrarna i ruralna politika II. Ispitni materijali. Studij: Agrobiznis i ruralni razvitak. Zagreb: Sveučilište u Zagrebu, Agronomski fakultet. Dostupno na: http://www.agr.unizg.hr/cro/nastava/moduli/doc/26578_predavanja.pdf

Additional literature

1. Franić, Ramona, Mikuš, Ornella, Grgić, I. (2012). Poljoprivredna politika u radovima hrvatskih autora 20. stoljeća. Društvena istraživanja 21 (2012), br. 4(118) 989-1006. Zagreb, Institut Ivo Pilar.
2. Tracy M. (2000): Hrana i poljoprivreda u tržnom gospodarstvu, uvod u teoriju, praksu i politiku (prijevod: T. Žimbrek). MATE d.o.o., Zagreb
3. Zakon o poljoprivredi,
4. Strateški plan ZPP-a 2023.-2027.
5. Zakon o poljoprivrednom zemljištu

MARKET AND FOOD MARKETING		
Coordinator	Ružica Lončarić	
Collaborators	Sanja Jelić Milković	
Study year and semester	Third year, semester III	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (L50 + S25)
COURSE DESCRIPTION		
Course aims	To give the necessary information to students about market factors, legalities and specificities in the food market, as well as the marketing mix and marketing planning related to agricultural	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Justify the importance of the food
2. Define and analyse the food market: long-term trends, food supply
3. Justify food needs, consumption and demand
4. Define and explain the segmentation of the food market
5. Interpret the importance of food mix production and distribution
6. Interpret the significance of the price and promotional mix of food
7. Analyse food production in the Republic of Croatia and modern trends in the food market

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance, activities during the classes and seminars, evaluation of seminars and grades from partial exams. During the semester, students prepare independent seminar paper that is obligatory. Students also take two partial exams during classes. The final exam is mandatory, and a positive grade from the final exam is a prerequisite for a positive final grade. The final exam is written or oral.

Obligatory literature

1. Koester, U. (2020): Foundations of Agricultural Market Analysis and Agricultural Policy. Verlag Franz Vahlen GmbH; München.
2. Leko-Šimić, M. (2002): Marketing hrane. Ekonomski fakultet u Osijeku, Osijek.
3. Meler, M. (2005): Osnove marketinga. Ekonomski fakultet u Osijeku, Osijek.

Additional literature

1. Rocco, F. (1994): Marketinško upravljanje. Školska knjiga i CEMA, Zagreb.

ORGANIZATION AND COSTS OF AGRICULTURAL PRODUCTION		
Coordinator	Ljubica Ranogajec	
Collaborators	--	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (55L + 20E)
COURSE DESCRIPTION		
Course aims	Train students to organize and maintain favourable relations between factors of plant and livestock, rational implementation of the work process with the aim of achieving economic and profitable agricultural production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. To define the concept of organisation, form of company according to the companies Act; and of the family agricultural economy, their business functions and types of organisational structure
2. Identifies the factors of agricultural production and reviews the relationship within and between them
3. Calculate the optimal level of investment intensity according to raw material costs and the price of finished products
4. Standardize the performance of people and machines in the execution of works and plan the consumption of raw materials and auxiliary materials; present a technological map of individual production lines;
5. Plan the costs of raw materials, auxiliary materials, labor of people and machines and calculate the production calculation
6. Analyse economic indicators of production and business success and choose optimal production structure

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance (minimum 70%), activities in classes and grades from partial exams. During the semester, students take two partial exams (at 7 and 15 weeks of classes). The final exam is mandatory, and a positive grade from the final exam is a prerequisite for a positive overall grade. The final exam is oral.

Obligatory literature

1. Karić, M. (2002): Kalkulacije u poljoprivredi, Poljoprivredni fakultet u Osijeku, Osijek
2. Relić, B. (1996): Financijske tablice, Računovodstvo i financije, Zagreb
3. Weihrich, H. i Koontz, H. (1994): Menedžment, Deseto izdanje, MATE, Zagreb
4. Cirkveni Filipović, T. I sur. (2021): Obiteljska poljoprivredna gospodarstva, Biblioteka računovodstvo, Zagreb

Additional literature

1. Sikavica, P. (2011): Organizacija, Školska knjiga, Zagreb
2. Lacković, Z. (2004): Management malog poduzeća, Elektrotehnički fakultet i dr. Osijek (knjiga)
3. Internet cjenik sjemena, sadnog materijala, mineralnih gnojiva, pesticida, goriva i ulja, hrane za stoku
4. Zakon o trgovačkim društvima https://www.zakon.hr/z/546/Zakon-o-trgova%C4%8Dkim-dru%C5%A1tvima
5. Zakon o obiteljskom poljoprivrednom gospodarstvu, https://www.zakon.hr/z/1015/Zakon-o-obiteljskom-poljoprivrednom-gospodarstvu
6. Zakon o poljoprivrednom zemljištu, https://www.zakon.hr/z/133/Zakon-o-poljoprivrednom-zemlji%C5%A1tu
7. Katalog kalkulacija, https://www.savjetodavna.hr/product/katalog-kalkulacija-poljoprivredne-proizvodnje-za-2021-godinu/

PLANT PROTECTION I		
Coordinator	Ivana Majić	
Collaborators	Ankica Sarajlić Jelena Ilić Sanda Rašić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (55L + 20S)
COURSE DESCRIPTION		
Course aims	Introducing students to the principles of plant protection.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Explain the importance and role of insects, disease agents and weeds in agricultural production;
2. Describe and identify weeds, pests and disease agents according to the symptoms of damage to plants;
3. and compare different plant protection systems
4. Define plant protection products and basic concepts from phytomedicine
5. Argue advantages and disadvantages of the use of plant protection products
6. Integrate knowledge and decide on the need to apply pesticides

Assessment and evaluation of student work during classes

According to the Ordinance on studies and studying at J.J. Strossmayer University in Osijek, students are obliged to attend at least 70% classes. Students are obliged to write a seminar paper and present it. The seminar paper is mandatory for the final grade. In forming the final grade for students, continuous monitoring of classes is taken into account (class activity, preparation for the lesson, reflective review of the course content), seminar paper, partial written exam and final exam. Final exam is mandatory.

Obligatory literature

1. Ivezić, M. (2008): Entomologija – kukci i ostali štetnici u ratarstvu. Poljoprivredni fakultet u Osijeku Sveučilišta Josipa Jurja Strossmayera u Osijeku, Grafika d.o.o, str. 202.
2. Kišpatić, J. (1992.): Opća fitopatologija. Agronomski fakultet Zagreb.
3. Kovačević, J. (1976): Korovi u poljoprivredi. Nakladni zavod Znanje, Zagreb.
4. Baličević R., Ravlić M. (2013): Fitofarmacija
5. Glasilo Biljne Zaštite: Pregled sredstava za zaštitu bilja u Hrvatskoj. Izd. HDBZ, Zagreb. Osijek.

Additional literature

1. Oštrec, Lj. i Gotlin Čuljak, T. (2005.): Opća entomologija. Zrinski d.d. Čakovec 222 str.
2. Maceljski, M. (2002): Poljoprivredna entomologija. Zrinski Čakovec
3. Ćosić, J., Jurković, D., Vrandečić, K. (2006.): Praktikum iz fitopatologije.
4. Agrios, G.N. (2005.): Plant Pathology. General Aspects. 5th edition. Elsevier, Amsterdam
5. Knežević, M. (2006): Atlas korovne, ruderalne i travnjačke flore. Sveučilište u Osijeku, Poljoprivredni fakultet u Osijeku

PRODUCTION BASICS OF CEREALS, CASH AND FORAGE CROPS		
Coordinator	Mirta Rastija	
Collaborators	Manda Antunović Gordana Bukvić Ranko Gantner Dario Iljkić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (60 L + 10 E)
COURSE DESCRIPTION		
Course aims	Introducing students to morphological and biological characteristics and production technology of the most important grains, industrial and fodder plants.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to

1. Classify arable crops
2. Explain the importance of cereals, industrial and fodder plants in agricultural production and their role in the economy and the production of food and raw materials
3. Describe morphological and biological characteristics of the most important arable crops in the Republic of Croatia
4. Describe specific needs of individual arable crops for agroecological conditions during life cycles
5. Describe the production technology of the most widespread cereals, industrial and fodder plants

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance (minimum 70%), activities in classes and grades from partial exams. During the semester, students take three partial exams (at 6, 12 and 15 weeks of classes). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Kovačević, V., Rastija, M. (2014): Žitarice. Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku
2. Pospišil, A. (2010): Ratarstvo I. dio. Zrinski d.d., Čakovec
3. Pospišil, M.(2013): Ratarstvo II dio – industrijsko bilje. Zrinski d.d., Čakovec
4. Gantner, R., Bukvić, G., Steiner, Z. (2021): Proizvodnja krmnog bilja. Sveučilište Josipa Jurja Strossmayera u Osijeku. Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Pospišil, A., Pospišil, M. (2013): Ratarstvo – praktikum. Sveučilište u Zagrebu, Agronomski fakultet.
2. Gotlin, J., Pucarić, A. (1979): Specijalno ratarstvo (I. dio). Sveučilišna naklada Liber, Zagreb.
3. Vratarić M., Sudarić A. (2008): Soja. Poljoprivredni institut Osijek
4. Vratarić, M. i sur. (2004): Suncokret. Poljoprivredni institut Osijek
5. Stjepanović, M., Zimmer, R., Tucak, M., Bukvić, G., Popović, S., Štafa, Z. (2009): Lucerna. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku
6. Stjepanović, M., Štafa, Z., Bukvić, G. (2008): Trave za proizvodnju krme i sjemena. Hrvatska mljekarska udruga. Zagreb

BASICS OF AGRO-ECOLOGY		
Coordinator	Boris Đurđević	
Collaborators	Irena Jug	
Study year and semester	Third year, VI. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	L - 60, E- 15
COURSE DESCRIPTION		
Course aims	Students should receive basic information about the properties and role of soil in the agroecosystem, especially in the area of environmental protection. They must know the impact of agrochemicals on soil and plants, and the impact of ecophysiological factors on plant production	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. understand soil - plant - atmosphere relationships.
2. describe the physical and chemical properties of the soil and their impact on the bioaccessibility of plant nutrition elements.
3. distinguish the necessary elements for plant nutrition from useful and toxic elements, as well as the environmental impact of mineral and organic fertilisers
4. recognise the environmental impact of agrochemicals, in particular on water pollution.
5. calculate and correctly apply fertilizers after soil and plant analysis
6. distinguish the type and degree of soil degradation
7. understand physiological processes of plants and the role of individual elements in them.
8. describe the impact of environmental factors on the plant and the mechanisms used by plants to overcome stress

Assessment and evaluation of student work during classes

The final grade for students will be based on continuous monitoring of their participation in classes (activity during lessons, preparation for class, and reflective reviews of course content), continuous assessment and testing of knowledge (partial exams), and the final exam. Final exam is mandatory.

Class attendance is mandatory in accordance with the Regulations on Studies at the J.J. Strossmayer University of Osijek.

Obligatory literature

1. Jug, I., Jug, D., Brozović, B., Vukadinović, V., Đurđević, B. (2022): Osnove tloznanstva i biljne proizvodnje, Fakultet agrobiotehničkih zanaosti Osijek, Osijek, Hrvatska.
2. Vukadinović, V., Bertić, B. (2013.): Filozofiija gnojidbe – Sve što treba znati o gnojidbi, Autorska naklada, Osijek.
3. Vukadinović, V., Jug, I., Đurđević, B. (2014): Ekofiziologija bilja. NSS. Osijek.
4. Vukadinović, V., Vukadinović, V. (2011.): Ishrana bilja, Poljoprivredni fakultet u Osijeku. Osijek
5. Đurđević, Boris (2014): Praktikum iz ishrane bilja. Osijek: Poljoprivredni fakultet u Osijeku, 2014

Additional literature

1. Đurđević, Boris; Jug, Irena; Jug, Danijel; Vukadinović, Vesna; Stipešević, Bojan; Brozović, Bojana (2017): Primjena biougljena kao kondicionera tla – korak ka održivoj biljnoj proizvodnji. Osijek: Vijeće za istraživanja u poljoprivredi.

EXPLOITATION AND MAINTENANCE OF AGRICULTURAL MACHINERY		
Coordinator	Tomislav Jurić	
Collaborators	Željko Barač Đurđica Kovačić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	Acquaint students with factors influencing rational use of agricultural machinery and with service - preventive maintenance measures.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Explain production processes in agriculture and tractor - machine aggregates and evaluate the work of tractor - machine aggregates.
2. Distinguish individual agro-technical, technical - industrial and exploitation indicators.
3. Explain the resistance and balance of resistance of agricultural machinery.
4. Distinguish between the arrangements and the operation speed of agricultural aggregates.
5. Explain the structure and utilisation of working hours and the effect of aggregates.
6. Explain the concept and significance of service - preventive maintenance of agricultural machinery.
7. Describe the function and maintenance of individual tractor systems and maintenance of individual agricultural machines.
8. Explain technical protection and garaging of agricultural machinery and environmental legislation considering used motor oils and other waste materials.

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance (minimum 70%), activities in classes and grades from partial exams. During the semester, students take two partial exams (at 7 and 15 weeks of classes). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is

Obligatory literature

1. Emert, R., Jurić, T., Štefanek, E., Filipović. D: (1995): Održavanje traktora i poljoprivrednih strojeva,
2. Sebastijanović, S.(2002): Osnove održavanja strojarskih konstrukcija, Slavonski Brod.
3. Brkić, D., Vujčić, M., Šumanovac, L., Lukač, P., Kiš, D., Jurić, T., Knežević, D.(2005): Eksploatacija poljoprivrednih strojeva
4. Bekčić, M. (1981): Održavanje i remont mehanizacije, Beograd.
5. Zakon o otpadu, N.N. 178/04

Additional literature

The latest publications in the field of exploitation and maintenance of agricultural machinery.

PROCESSING, STORAGE AND TRANSPORT TECHNIQUES IN AGRICULTURE		
Coordinator	Darko Kiš	
Collaborators		
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (50 L + 25 S)
COURSE DESCRIPTION		
Course aims	To enable undergraduate students to master the material and acquire knowledge with basic principles of work and trends of technology development in the improvement, storage and transport of agricultural products.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Describe the physical and mechanical characteristics of the transported materials
2. Choose the optimal type of warehouse and economic yard according to the quantity and type of products
3. Describe the principle of operation of internal transport means in agriculture
4. Define the theoretical fundamentals of grain drying and types of dryers
5. Prepare and present a given topic in the field of finishing techniques, storage and transport technology in agriculture

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are earned based on the class attendance (minimum 70%) and class activities. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Brkić, D., Vujčić, M., Šumanovac, L., Lukač, P., Kiš, D., Jurić, T., Knežević, D.: Eksploatacija poljoprivrednih strojeva, Poljoprivredni fakultet u Osijeku, Osijek, 2005.
2. Katić, Z.: Sušenje i sušare u poljoprivredi, Multigraf d. o. o., Zagreb, 1997.
3. Šumanovac, L., Sebastijanović, S., Kiš, D.: Transport u poljoprivredi, Poljoprivredni fakultet u Osijeku, Osijek, 2011.
4. Ritz, Josip (1997): Uskladištavanje ratarskih proizvoda. PBI d.o.o. Zagreb

Additional literature

1. Šumanovac, L.: Transport u poljoprivredi, Poljoprivredni fakultet u Osijeku, Osijek-Vinkovci, 2001.
2. Znanstveno-stručni radovi objavljeni u referentnim međunarodnim časopisima koji će poslužiti za pripremu seminara

ECOLOGICAL ZOO-TECHNIQUE		
Coordinator	Danijela Samac	
Collaborators	Zvonko Antunović Pero Mijić Davor Kralik Josip Novoselec Željka Klir Šalavardić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (65L + 10E)
COURSE DESCRIPTION		
Course aims	Acquaint students with the basics of ecological production of domestic animals.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Explain the concept, meaning and state of ecological production of animals in our country and in the world, legal regulations in organic production. Describe the ecologically friendly breeding of domestic animals, the animal breeds for ecological production. Indicate the authorised feed materials and additives in animal nutrition.
2. Describe the housing of supra lactating sows, the housing of suckling sows with piglets, the housing of weaned piglets, accommodation of fattening pigs. Describe the basic principles of poultry keeping, floor poultry keeping, free (outdoor) poultry keeping. Describe the basic principles of housing sheep and goats, keeping breeding, pregnant and lactating sheep and goats, keeping lambs and baby goats, keeping animals for fattening. Describe keeping dairy cows, keeping fattening calves, keeping calves.
3. Study organic breeding of individual categories of pigs and individual species and categories of poultry, organic breeding of individual categories of cattle, organic breeding of sheep and goats.
4. Point out the welfare and protection of the health of domestic animals in organic production. Describe the quality of meat, milk and eggs from the point of view of human health. Describe the removal of solid manure, slurry and biogas production.

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are achieved on the basis of attendance, activities in classes and grades from partial exams. During the semester, students take one midterm and four oral exams. The final exam is mandatory and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Senčić, Đ., Antunović, Z., Mijić, P., Baban, M., Puškadija, Z. (2011). Ekološka zootehnika. Poljoprivredni fakultet u Osijeku, Sveučilište Josipa Jurja Strossmayera u Osijeku.
2. Senčić, Đ. Samac, D. (2021): Organsko (ekološko) svinjogojstvo. Sveučilište J. J. Strossmayera u Osijeku. Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Kisić, I. (2014.): Uvod u ekološku poljoprivredu. Sveučilište u Zagrebu Agronomski fakultet.
2. Benčević, K. (1993): „Biokont- osnove biološkog poljodjelstva». Poslovna zajednica za stočarstvo, Zagreb.
3. Slijepčević, V. (2002): Ekološka proizvodnja. Saturn, Zagreb.
4. Znaor, D. (1996): Ekološka poljoprivreda. Nakladni zavod Globus, Zagreb.

RENEWABLE ENERGY RESOURCES		
Coordinator	Davor Kralik	
Collaborators	Đurđica Kovačić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (45L + 10E + 20S)
COURSE DESCRIPTION		
Course aims	To acquaint the undergraduate students with the different sources of renewable energy, the characteristics of different RES plants and the role of RES in environmental protection.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Define legal regulations of the Republic of Croatia and the EU for Renewable Energy Sources (RES)
2. Define biomass sources and the method of conversion into energy
3. Describe biogas properties, biogas anaerobic fermentation process,
4. Define biogas plants
5. Describe biodiesel and its properties, biodiesel production technology, usage options of biodiesel in agriculture
6. Dimensioning of different plants for the production of RES
7. Calculations of energy potential of raw materials bases for RES production
8. Describe the environmental impact of RES

Assessment and evaluation of student work during classes

Eligibility to take the final exam is granted by accumulating a minimum number of assessment points. These points are earned through class attendance (at least 70%), participation in class activities, and grades from partial exams and seminar. The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final grade. The final exam is written.

Obligatory literature

1. Ljubomir Majdandžić (2010) Solarni sustavi
2. Boris Labudović i sur. (2009) Dizalice topline
3. Ljubomir Majdandžić (2008) Obnovljivi izvori energije
4. Gordana Kralik (2007) Svinjogojstvo - biološki i zootehnički principi

Additional literature

1. Baličević, I. et al. (2001): Agrar energija i ekologija,
2. Graf, W. (1994): Biogas- Historisches, Biogas für Österreich, Gefördert vom Bundesministerium für Umwelt, Jungend und Familie,
3. Đulbić, M. (1986): Biogas, dobijanje, korištenje i gradnja uređaja, Beograd,
4. WienHorst Eichhorn (1985): Landtechnik, Stuttgart
5. Petar Kulišić (1991): Novi izvori energije, Školska knjiga Zagreb
6. BIOEN (2001): Projekt biodizel – uvođenje proizvodnje biodizelskoga goriva u RH, Energetski institut ''Hrvoje Požar'' Zagreb.“Hrvoje zapalar” Zagreb.

SPECIAL ZOO-TECHNICS		
Coordinator	Mirjana Baban	
Collaborators	Maja Gregić Pero Mijić Zvonko Antunović Josip Novoselec Željka Klir Šalavardić Zlata Kralik Vladimir Margeta Tina Bobić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (45L + 10E + 20S)
COURSE DESCRIPTION		
Course aims	Acquaint students with the basics in equestrian, cattle, sheep, goats, poultry, and pig production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Describe economic importance of equine, cattle, sheep, goat, poultry and pig production.
2. Identify and describe the most important breeds of horses, cattle, sheep and goats, poultry and pigs in Croatia and in the world
3. define the factors on which milk and meat production depends taking into account anatomical and physiological functional characteristics,
4. explain modern technologies in equestrian, cattle, sheep and goat, poultry and pig production

Assessment and evaluation of student work during classes

In forming the final grade for students, continuous monitoring of classes (activity in class, preparation for the lesson, reflective review of teaching content), continuous monitoring and checking of knowledge (partial exams and seminar work), and final written exam are taken into account. The final exam is mandatory and a positive grade on the final exam is a prerequisite for a positive final grade.

Obligatory literature

1. Kralik, G., Zdeněk, A., Baban, M., Bogut, I., Gantner, V., Ivanković, S., Katavić, I., Kralik, D., Kralik, I., Margeta, V., Pavličević, J. (2011): Zootehnika. Grafika, Osijek.
2. Mioč, B., Pavić, V. (2002): Kozarstvo. Hrvatska mljekarska udruga, Zagreb.
3. Mioč, B., Pavić, V., Sušić, V. (2007): Ovčarstvo. Hrvatska mljekarska udruga, Zagreb.
4. Uremović, Z., Uremović, M., Pavić, V., Mioč, B., Mužic, S., Janječić, Z. (2002): Stočarstvo. Agronomski fakultet, Zagreb

Additional literature

1. Baban, M. (2014): Osnove rada s konjima. Priručnik. Gradska tiskara, Osijek.
2. Caput, P. (1996): Govedarstvo. Celeber, Zagreb.
3. Ivanković, A. (2004): Konjogojstvo. Hrvatsko agronomsko društvo, Zagreb.
4. Kralik G., Has-Schön E., Kralik D., Šperanda M. (2008): Peradarstvo – biološki i zootehnički principi. Grafika, d.o.o. Osijek.
5. Kralik G., Kušec G., Kralik D., Margeta V. (2007): Svinjogojstvo – biološki i zootehnički principi. Grafika, d.o.o. Osijek.
6. Uremović, Z. (2004): Govedarstvo. Hrvatska mljekarska udruga, Zagreb

FEEDING DOMESTIC ANIMALS AND FOOD PRODUCTION		
Coordinator	Matija Domaćinović	
Collaborators	Ivana Prakatur Mario Ronta	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	L – 55, E – 20, S – 0
COURSE DESCRIPTION		
Course aims	The objective is to familiarize students with the fundamentals of feeding domestic animals and the nutritional characteristics of feed in animal nutrition.	
Course enrolment requirements	*No*	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Distinguish between anatomical and physiological characteristics of the digestive system of individual animals and define the concept of digestibility and enumerate and explain what it depends on
2. Classify nutrients and list the major representatives and describe their physiological role in organisms of domestic animals
3. Explain the calculation of the energy value of feed materials in practical newer energy units
4. Define the chemical composition and nutritional value of fodder and explain their potential for use in animal feed
5. Explain the application of feeding technology for individual species and categories of animals
6. Explain the calculation of meals and mixtures in the feeding of individual categories of bovine, porcine and poultry.

Assessment and evaluation of student work during classes

The right to take the final exam is achieved by collecting a minimum number of assessment points. Assessment points are earned on the basis of class attendance (minimum 70%), class activities and grades from partial exams. During the semester, students take three partial exams (during classes). The final exam is mandatory, and a positive grade from the final exam is a prerequisite for a positive final grade. The final exam is oral.

Obligatory literature

1. Domaćinović, M. (2006): Hranidba domaćih životinja, osnove hranidbe, krmiva, Poljoprivredni fakultet u Osijeku.
2. Domaćinović, M., Z. Antunović, E. Džomba, A. Opačak, M. Baban, S. Mužic (2015): Specijalna hranidba domaćih životinja, (odabrana poglavlja), Poljoprivredni fakultet u Osijeku.
3. Domaćinović, M. (1999): Praktikum vježbi hranidbe domaćih životinja. Poljoprivredni fakultet u Osijeku.

Additional literature

1. Senčić, Đ., Z. Antunović, J. Novoselec, D. Samac, I. Prakatur, T. Bobić, Ž. Klir (2021): Tehnologija animalne proizvodnje (poglavlje 2.), Fakultet agrobiotehničkih znanosti Osijek.

HUNTING AND CYNOLOGY		
Coordinator	Tihomir Florijančić	
Collaborators	Ivica Bošković	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS	6
	Number of hours (L + E + S)	75 (L - 50, E - 25)
COURSE DESCRIPTION		
Course aims	The objective is to introduce students to the biology and ecology of wildlife, the basics of game management, and the study of dog breeding and training (cinology).	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. List the legislation covering the hunting area and compare it with the legislation in Europe; and the world.
2. To describe the biological and ecological characteristics of the animal species classified as game.
3. Interpret the ecological factors of habitats with the aim of assessing the economic capacity of game reserves and, based on that, plan management guidelines for different types of game reserves.
4. List and describe the various types of hunting weapons and explain the ballistics of hunting weapons.
5. List and describe the trophies of game animals.
6. Recognize and describe specific breeds of hunting dogs and their uses.

Assessment and evaluation of student work during classes

Students are expected to attend classes regularly and actively participate in tasks during the lectures. In the second part of the semester, a field trip to a hunting ground will be organized, where students will observe the practical implementation of activities related to game management. Attendance at the field trip is mandatory. During the semester, two partial written exams will be held— the first covering hunting legislation, biology and ecology of game species, and hunting ground management, and the second covering game trophies, weapons, and hunting dog handling. Students will be informed about the exact dates of the partial exams at the beginning of the semester. The final exam is oral. Students are advised to take notes during lectures and prepare for the exams using the required literature. PowerPoint presentations will be used during lectures to help explain the content being discussed. These presentations will be available to students in digital form on the Merlin platform.

Obligatory literature

1. Tucak, Z. i sur. (2002): Lovstvo, drugo prošireno izdanje. Poljoprivredni fakultet u Osijeku
2. Tucak, Z. i sur. (2006): Zaštita divljači. Poljoprivredni fakultet u Osijeku.
3. Janicki, Z. i sur. (2007): Zoologija divljači. Veterinarski fakultet Sveučilišta u Zagrebu.
4. Anonimus : Zbirka zakonskih i podzakonskih propisa iz lovstva. Ministarstvo poljoprivrede

Additional literature

1. Mustapić, Z. (gl.ur.) (2004): Lovstvo. Hrvatski lovački savez, Zagreb.
2. Darabuš, S. i sur. (2009): Osnove lovstva. Hrvatski lovački savez, Zagreb.
3. Frković, A. (2006): Priručnik za ocjenjivanje lovačkih trofeja. Hrvatski lovački savez, Zagreb.

LANDSCAPE SHAPING AND DENDROLOGY		
Coordinator	Alka Turalija	
Collaborators	-	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (L 55, E 20, S 0)
COURSE DESCRIPTION		
Course aims	Introduce students to landscape typology, the history of garden architecture, the design of green spaces in urban areas, the basics of dendrology and ornamental woody plants, as well as relevant legislation and calculations.	
Course enrolment requirements	Floriculture	

Intended course learning outcomes

After successfully completing the module, the student will be able to:

1. Clearly identify historical stages and characteristics of landscape architecture.
2. Define concepts and necessary documents for nature conservation, and evaluate cultural park and landscape values.
3. Describe and determine specific landscape typology with evaluation.
4. Describe and determine design styles, and the application and selection of garden techniques and project planning using landscape architecture project planning methods (AutoCAD basics).
5. Define all maintenance measures for green spaces with calculations and the application of gardening standards; clearly describe the use of standards, and define and practically determine systems, measures, and preparations for green spaces with the application of horticultural techniques.
6. Define and identify ornamental tree and shrub species, and recognize diseases and pests of urban trees and shrubs.

Assessment and evaluation of student work during classes

In determining the final grade for students, continuous class participation is taken into account (including class activity, preparation for class, and reflective analysis of course content), as well as grade from seminar paper. The evaluation of the seminar paper includes clarity, accuracy and relevance of the information of the seminar, as well as the overall (technical and visual) quality of the presentation. The final grade is also influenced by the student's willingness and activity to participate in experimental work or research. The final exam is written and oral. Attendance is obligatory in accordance with the Ordinance on studies and studying at the J. J. Strossmayer University in Osijek.

Obligatory literature

1. Ogrin, D. (1993):Vrtna umetnost sveta, Prud-Ljubljana,
2. Obad-Šćitaroci, M. (1992): Hrvatska parkovna baština.Zaštita i obnova, Zagreb
3. Jurčić,V. – Kurtela, M. (1985): Povijesni vrtovi i perivoji kon nentalne zone SR Hrvatske, Vrtna umjetnost Jugoslavije Zagreb
4. Gostl, I. (1994): Zagrebački perivoji i promenade, Zagreb
5. Neufert,P.(2002): Elementi arhitektonskog projektiranja, Golden marketing, Zagreb
6. Prinz, D. (2006): Urbanizam – Svezak I i II, Golden marketing-tehnička knjižara i Arhitektonski fakultet Zagreb
7. Idžojtić, Marilena (2010.): Dendrologija-list;Sveučilište u Zagrebu, Šumarski fakultet
8. Borzan,Ž.:Imenik drveća i grmlja – latinski, hrvatski, englesaki njemački, Hrvatske šume, Zagreb,

Additional literature

1. Clifton, C., (2007): Novi dizajn vrta-Kako kreirati suvremeni životni prostor na otvorenom , LEO COMERCE d.o.o., Rijeka

ANIMAL WELLBEING		
Coordinator	Boris Antunovic	
Collaborators	Mislav Đidara	
Study year and semester	Second year, semester IV	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	75 (65L + 10E)
COURSE DESCRIPTION		
Course aims	Acquainting students with the criteria for meeting animal welfare aspects necessary for initiating and conducting agricultural production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. To analyze the human - animal relationship throughout history.
2. Identify behavioural needs of farmed animals and wild animals.
3. Link changes that have occurred through domestification.
4. Identify constants in animal instinct.
5. Define pain, suffering, stress and homeostasis.
6. Apply adequate wellbeing conditions for proper reproduction, substance exchange, display of innate social and individual patterns of behavior.
7. Prevent the occurrence of etopathies and technopathies.
8. Ensure animal welfare in breeding, use for experiments and scientific research, in transport; and the sloughtering.

Assessment and evaluation of student work during classes

For obtaining 6 ECTS credits, a student shall have the following obligations:

- attend a minimum of 70% of classes (lectures and field classes);
- be active in class or follow classes, participate in discussions, and resolve the given tasks;
- pass the final oral exam.

The final exam is mandatory, and a positive grade from the final exam is a prerequisite for a positive final grade.

Obligatory literature

1. Ponašanje domaćih životinja (Pavičić, Ž., K. Matković, ur.), Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb, 2014. (prema 2. engleskom izdanju Per Jensen: The Ethology of Domestic Animals: An Introductory Text (Modular Texts)
2. Zakon o zaštiti životinja ("Narodne novine", broj 135/06, 37/13 i 125/13 - Zakon o provedbi uredbi Europske unije o zaštiti životinja)
3. Zakon o dobrobiti životinja (("Narodne novine", broj 19/99)

Additional literature

1. Fraser A.F. and D.M. broom (1998): farm animal behavior and Welfare. Cab International, UK.

BREEDING AND KEEPING OF PETS		
Coordinator	Ivica Bošković	
Collaborators	Dinko Jelkić	
Study year and semester	Third year, semester VI.	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L + E + S)	L- 40, E- 20, S - 15,
COURSE DESCRIPTION		
Course aims	The aim of the module is to familiarize students with the basic methods of breeding different types of pets to meet market needs and for hobby breeding. Furthermore, it is necessary to master the methods of keeping and the specific characteristics of breeding, as well as the required zoohygienic conditions and specific care for individual species and categories of pets.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

After the course has been successfully completed, the student will be able to:

1. Describe the necessary zoohygienic conditions for keeping pets for hobby and keeping them for commercial purposes (size, shape and construction method of housing, feeding methods, necessary microclimatic conditions – temperature, humidity, ventilation).
2. Interpret the influence of external factors (length of daylight and artificial illumination, and temperature of dwellings and humidity of air on the results of cultivation.
3. Describe the different species and breeds of animals kept as pet animals (dogs, cats, ornamental rabbits and pigeons, parrots, canaries and exotic birds, aquarium fish and reptiles, and most common diseases that attack them, methods of suppression by alternative methods and prophylaxis.
4. Interpret the specifics of animal preparation and care for performances at exhibitions, fairs and evaluations
5. Select and describe the different husbandry methods, their characteristics and characteristics in the husbandry value of populations
6. Calculate cost price, cost-effectiveness of breeding and production of pets for commercial purposes
7. Control the technology of breeding and maintaining the necessary microclimatic conditions in dwellings in the purpose of improving animal health and welfare

Assessment and evaluation of student work during classes

In determining the final grade for students, continuous class participation is taken into account (including clas activity, preparation for class, and reflective analysis of course content), as well as written partial exam an seminar. The evaluation of the seminar paper includes the clarity, accuracy and relevance of the written semina information, as well as the overall (technical and visual) quality of the presentation.

Attendance is obligatory in accordance with the Ordinance on studies and studyings at the J. J. Strossmaye University in Osijek. The final exam is mandatory, and a positive grade from the final exam is a prerequisite fo a positive final grade.

Obligatory literature

1. Bauer, M. (2000): Kinologija 1, Uzgoj, njega i hranidba pasa, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb
2. Gianinetti, R. (1995): Veterinar u kući, “Mosta” Zagreb
3. Josipović, M. (2007): Priručnik za uzgoj kanarinaca, Leo komerc Rijeka
4. Pavičić, Ž. (2002): Golubarstvo, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb
5. Prukner Radovčić, E. (2010.): Bolesti ptica kućnih ljubimaca, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb
6. Smokvina-Boranić, Č. (1977): Vaši kućni ljubimci, Nakladni zavod “Znanje” Zagreb
7. Taylor D. (1990): Vaša mačka, Mladost, Zagreb
8. Tucak, Z. i sur (2003): Lovna kinologija, Poljoprivredni fakultet u Osijeku, Osijek