Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

CURRICULUM

Agriculture (University Undergraduate Study Programme)

Major in **PLANT PRODUCTION**

Academic Year 2022 - 23

June, 2022

List of Teachers and Courses

Academic Year 2022 - 23

Agriculture (University Undergraduate Study Programme)

Major in **PLANT PRODUCTION**

A full-time Study Programme

I.semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Tihomir Živić	German Language I	Tihomir Živić	30			45		5
Tihomir Živić	English Language I	Tihomir Živić	30			45		5
Vesna Rastija	Chemistry	Vesna Rastija	45					6
		Maja Karnaš				9	6	
		Domagoj Šubarić				9	6	
Maja Petrač	Mathematics	Maja Petrač	45			30		6
Edita Štefanić	General Botany and Zoology	Edita Štefanić	25					6
		Siniša Ozimec	20					
		Sanda Rašić					15	
		Tihomir Florijančić					5	
		Ivica Bošković					5	
Krunoslav Zmaić	Basics of Agricultural Economics	Krunoslav Zmaić	30					6
		Tihana Sudarić	30					
		David Kranjac		15				
Mario Keškić	Physical education and sports	Mario Keškić			30			1

II. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Tihomir Živić	German Language II	Tihomir Živić	30			45		5
Tihomir Živić	English Language II	Tihomir Živić	30			45		5
Vesna Gantner	Principles of Animal Breeding	Vesna Gantner Mirna Gavran	45			 30		6
Danijel Jug	Agro-climatology and Basics of Physics	Danijel Jug Bojan Stipešević Bojana Brozović	30 20 5	 10		 10		6
Bojan Stipešević	Basics of Plant Production	Bojan Stipešević Miro Stošić Danijel Jug Bojana Brozović	30 10 10			 25		6
Monika Marković	Agricultural meliorations	Monika Marković	45		5	25		6
Mario Keškić	Physical education and sports	Mario Keškić			30			1

III. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Đuro Banaj	Agricultural mechanization in Plant Production	Đuro Banaj Vjekoslav Tadić Anamarija Banaj	25 20		 5 5	 5 15		6
Sonja Petrović	Genetics	Sonja Petrović Andrijana Rebekić	42 3			30		5
Domagoj Rastija	Pedology	Domagoj Rastija Vladimir Zebec	45				 30	6
Tihana Teklić	Plant Physiology	Tihana Teklić Miroslav Lisjak Dejan Agić	20 20 20				 10 5	6
Gabriella Kanižai Šarić	General Microbiology	Gabriella Kanižai Šarić	50				25	6
Mario Keškić	Physical education and sports	Mario Keškić			30			1

IV. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Zdenko Lončarić	Plant nutrition	Zdenko Lončarić Boris Đurđević Vladimir Ivezić	33 22				10 10	5
Karolina Vrandečić	Phytopathology I	. Jasenka Ćosić Karolina Vrandečić Tamara Siber Đuro Banaj	15 35 5	10			10	5
Manda Antunović	Production industrial crops	Manda Antunović	60					5
		Ivana Varga		5		10		
Ivana Majić	Entomology I	Ivana Majić Ankica Sarajlić Josipa Puškarić	40 5			15	15	6
Edita Štefanić	Plant Systematics	Edita Štefanić Sanda Rašić	45		6		24	5
Zdenko Lončarić	Fertilization in Plant Production	Zdenko Lončarić Vladimir Ivezić	30 10					3
Mario Keškić	Physical education and sports	Mario Keškić			30			1

V. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			ECTS
					FE	AE	LE	
Dario Iljkić	Basics of Cereals Production	Mirta Rastija Dario Iljkić	20 40			15		6
Gordana Bukvić	Production of fodder plants	Gordana Bukvić Ranko Gantner Goran Herman	35 20	10		10		5
Sonja Vila	Plant Breeding and Seed Production	Sonja Vila Vlado Guberac Sunčica Kujundžić	10 35 30					5
Vlatka Rozman	Storage and Technology of Agricultural Products	Vlatka Rozman Anita Liška Pavo Lucić	40 15	10		5	5	5
Renata Baličević	Principles of Phytomedicine in Plant Production	Renata Baličević Marija Ravlić	20			15		
	FINAL THESIS							6

VI. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			ECTS
					FE	AE	LE	
Andrijana Rebekić	Practical work I	Andrijana Rebekić			75			6
	Elective course							6
	Elective course							6
	Elective course							6
	Elective course							6

GERMAN LANGUAGE I		
Coordinator	Tihomir Živić	
Collaborators	-	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	5
	Contact hours (L+E+S)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	The development of listening, speaking, reading, and writing skills, as well as the correct use of grammatical and vocabulary structures in the German language, within the field of agrobiotechnology.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, students will be able to: 1. Engage in an oral discussion based on a reading or listening comprehension of a foreign-language text or conversation; 2. Produce a written summary with a specified word count; 3. Interpret a text; 4. Apply newly acquired vocabulary and constructions in a new context; 5. Utilize information technology skills to gather information in a foreign language on a specific topic; 6. Analyze graphical data (tables, charts, maps, etc.); and 7. Write an essay or create a presentation on a related topic.		
Assessment and evaluation of student work during classes		
The right to take the final oral exam is granted by accumulating a minimum number of assessment points. These points are earned through attendance of at least 70% of classes (i.e., lectures and auditory exercises), active participation in class, and grades from partial written exams. During the semester, students will take two partial written exams (in the 7th and 15th weeks of instruction). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for receiving a positive final course grade.		
Obligatory literature		
1. Ertl, Josef, i dr. *Tausend Fragen für den jungen Landwirt*. 16. izd., Verlag Eugen Ulmer, 1996. 2. Glovacki-Bernardi, Zrinka. *Gramatika njemačkog jezika—osnove*. Školska knjiga, 2017. 3. Haensch, Günther, i Gisela Haberkamp de Anton. *Wörterbuch der Landwirtschaft*. Verlag Eugen Ulmer, 1996. 4. Kljaić, Jasenka. *Hrvatsko-njemački praktični rječnik*. Školska knjiga, 2017. 5. ———. *Njemačko-hrvatski praktični rječnik*. Školska knjiga, 1998. 6. Leitner, Hans. *Njemačko-hrvatski rječnik glagola u kontekstu*. Školska knjiga, 1998. 7. Marčetić, Tamara. *Njemački za odrasle*. Školska knjiga, 1997. 8. Matas, Đurđa. *Četverojezični rječnik hrvatsko-njemačko-englesko-latinski: oko 60.000 leksičkih jedinica iz poljoprivrede, šumarstva, veterine, primijenjene biologije*. Profil International, 1999.		
Additional literature		
1. Bašić, Zlatko. *Veliki hrvatsko-njemački rječnik gospodarskog, pravnog, političkog i svakodnevnog stručnog nazivlja*. Bašić, 2000. 2. Marčetić, Tamara. *Njemački u komunikaciji*. Školska knjiga, 2005. 3. Matas, Đurđa. *Zoološki rječnik hrvatsko-njemačko-englesko-latinski*. Školska knjiga, 2009.		

ENGLISH LANGUAGE I		
Coordinator	Tihomir Živić	
Collaborators	-	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	5
	Contact hours (L+E+S)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	The development of listening, speaking, reading, and writing skills, as well as the correct use of grammatical and vocabulary structures in (American) English, within the field of agrobiotechnical studies.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, students will be able to: 1. Recognize and independently explain key Anglo-American terminology related to their respective fields in authentic (didacticized) Anglo-American scientific and professional texts; 2. Utilize prescribed specialist literature and multimedia sources at all levels (business promotional texts, product labels, work instructions, and scientific articles); 3. Comprehend and translate technical texts in (American) English; 4. Communicate accurately in (American) English within the field of agrobiotechnology; 5. Present agrobiotechnical content accurately in (American) English.		
Assessment and evaluation of student work during classes		
The right to take the final oral exam is earned by accumulating a minimum number of assessment points . assessment points are awarded through attendance of at least 70% of classes (i.e., lectures and listening exercises), active participation in class, and grades from partial written exams. During the semester, students will take two partial written exams (in the 7th and 15th weeks of instruction). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for achieving a final positive course grade.		
Obligatory literature		
1. Bratulić, Mirna. *Found in Translation: Handbook with Exercises*. Hrvatska sveučilišna naklada, 2010. 2. Gačić, Milica. *Gramatika engleskoga jezika struke*. Školska knjiga, 2009. 3. Murphy, Raymond, i dr. *Basic Grammar in Use Student's Book with Answers and Interactive eBook: Self-study Reference and Practice for Students of American English*. 4. izd., Cambridge UP, 2017. 4. Perković, Anica. *English in Agriculture*. Poljoprivredni fakultet Osijek, 2011. 5. Vujčić, Jasna, i Anica Perković. *English for Horticulturists*. Veleučilište u Slavonskome Brodu / Poljoprivredni fakultet Osijek, 2011.		
Additional literature		
1. Filipović, Rudolf. *Veliki englesko-hrvatski rječnik*. Školska knjiga, 2017. 2. Hlavac, Jim, i dr. *Translating from Croatian into English: A Handbook with Annotated Translations*. Hrvatska sveučilišna naklada, 2019. 3. Matas, Đurđa. *Četverojezični rječnik iz poljoprivrede, šumarstva, veterine i primijenjene biologije: hrvatsko-njemačko-englesko-latinski*. Profil, 1999. 4. Murphy, Raymond. *English Grammar in Use*. 5. izd., e-knjiga, Cambridge UP, 2019. 5. Ritz, Josip. *Hrvatsko-engleski i englesko-hrvatski agronomski rječnik*. Školska knjiga, 1996.		

CHEMISTRY		
Coordinator	Vesna Rastija	
Collaborators	Maja Karnaš Domagoj Šubarić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Contact hours (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	Familiarizing students with the fundamentals of general, inorganic, and organic chemistry, chemical calculations, and practical work in the chemistry laboratory.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to: 1. Differentiate between types of substances. 2. Relate the electronic structure of atoms to the chemical and physical properties of elements. 3. Illustrate the formation and geometry of chemical bonds. 4. Explain chemical equilibrium and the energy changes occurring during chemical reactions. 5. Demonstrate the fundamental reactions of electron and proton transfer. 6. Assess the acid-base properties of chemical compounds. 7. Describe the structure, reactivity, and properties of basic inorganic compounds relevant to agronomy. 8. Distinguish the structures, properties, and reactivity of key types of organic compounds. 9. Solve basic stoichiometric problems. 10. Apply the principles of safe laboratory practices in performing basic techniques of qualitative and quantitative chemical analysis.		
Assessment and evaluation of student work during classes		
The right to access the final exam is earned by accumulating a minimum number of assessment points. assessment points are awarded based on class attendance (at least 70%), active participation in class, and grades from partial exams. During the semester, students will take five partial exams (two from the exercises in the 6th and 13th weeks, and three from the lectures in the 8th, 11th, and 15th weeks). 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. Rastija, V. (2022): Odabrana predavanja iz opće i anorganske kemije (interna skripta) Fakultet agrobiotehničkih znanosti Osijek 2. Amić, D. (2008): Organska kemija za studente agronomske struke, Školska knjiga, Zagreb 3. Rastija, V. (2016.): Zbirka zadataka iz kemije, Fakultet agrobiotehničkih znanosti Osijek 4. Rastija, V.; Karnaš, M. (2020): Uvod u kemijsku analizu, priručnik za laboratorijske vježbe. Fakultet agrobiotehničkih znanosti Osijek		
Additional literature		
1. Filipović, I.Lipanović, S. (1995): Opća i anorganska kemija I. i II. dio, Školska knjiga, Zagreb 2. Sikirica, M. (2001.): Stehiometrija, Školska knjiga, Zagreb, 2001.		

MATHEMATICS		
Coordinator	Maja Petrač	
Collaborators	-	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	5
	Contact hours (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	Introduce students to fundamental concepts of functions, as well as methods of differential and integral calculus. The lectures will cover basic concepts and illustrate their applications. In the exercises, students are expected to master the appropriate techniques and become proficient in solving specific problems.	
Course enrolment requirements	No preconditions	

Intended course learning outcomes

Upon successful completion of the module, the student will be able to:

1. Apply knowledge of functions to specific professional problems.
2. Explain the concept of a string and the concept of string convergence. Distinguish between certain special strings.
3. Explain the concepts of a function's limit and continuity, and apply this knowledge to practical problems.
4. Apply differential calculus to specific problems (tangent and normal lines, monotonicity, local extrema, convexity, inflection points).
5. Interpret the concept and properties of definite and indefinite integrals, as well as improper integrals.
6. Apply new knowledge to specific problems, such as calculating the arc length of a curve, the area of a pseudo-trapezoid, the volume of a solid of revolution, etc.
7. Distinguish between types of differential equations and their solutions, and apply this knowledge to specific problems in the field.

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 awarded based on class attendance (at least 70%), active participation in class, submission of homework assignments on Merlin (the e-learning platform), and partial exams. During the semester, students will take two partial exams. The final exam is mandatory, consisting of a written and/or oral component, and a passing grade on the final exam is a prerequisite for a positive final grade.

Obligatory literature

1. D. Jukić, R. Scitovski, Matematika I, Prehrambeno tehnološki fakultet, Odjel za matematiku, Osijek 2000.
2. B. P. Demidović, Zadaci i riješeni primjeri iz više matematike s primjenom na tehničke nauke, Tehnička knjiga, Zagreb, 1986.

Additional literature

1. M. Crnjac, D. Jukić, R. Scitovski, Matematika, Osijek, 1994.
2. J. Pečarić i dr., Matematika za tehnološke fakultete, Zagreb, 1994.
3. S. Kurepa, Matematička analiza 1 i 2, Tehnička knjiga, Zagreb, 1972.
4. V. Devide i dr., Riješeni zadaci iz više matematike, Školska knjiga, Zagreb, 1979.

GENERAL BOTANY AND ZOOLOGY		
Coordinator	Edita Štefanić	
Collaborators	Tihomir Florijančić Siniša Ozimec Prof. Ivica Bošković Sanda Rašić	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Contact hours (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	To familiarize the student with fundamental knowledge of the structure of cells and the functions of tissues and plant organs (both vegetative and generative). To introduce and equip the student with the ability to independently interpret the structural and functional characteristics of members of the animal kingdom, with a focus on the anatomy, function, and ecology of animal organisms.	
Course enrolment requirements	No preconditions	

Intended course learning outcomes

Upon successful completion of the module, the student will be able to:

1. Describe the chemical foundation of plant cells (biogenic elements and chemical compounds in plant cells).
2. Investigate, identify, and describe the structure of plant cells.
3. Explain and analyze the cell cycle (mitosis and meiosis).
4. Differentiate and analyze plant tissues and organs.
5. Explain the reproduction and dispersion of plants.
6. List the characteristics and organization of animal organisms.
7. Use scientific nomenclature in zoological taxonomy.
8. Relate evolutionary processes and phylogenetic relationships among groups within the animal kingdom.
9. Differentiate the structural and functional specificities between groups within the animal kingdom.
10. Identify animal species and groups that are beneficial or harmful to agriculture.

Assessment and evaluation of student work during classes

Eligibility to take the final exam is granted by accumulating a minimum number of grading 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 9th and 15th weeks of the course). 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. Bačić, T. (2003): Morfologija i anatomija bilja. Sveučilište J.J. Strossmayera u Osijeku, Pedagoški fakultet.
2. Denffer, D., Ziegler, H. (1988): Botanika, morfologija i fiziologija. Školska knjiga, Zagreb
3. Dubravec, K.(1996): Botanika. Agronomski fakultet Sveučilišta u Zagrebu.
4. Štefanić, E. (2005): Priručnik za vježbe iz agrobotanike. Sveučilište J.J. Strossmayera u Osijeku, Poljoprivredni fakultet.
5. Treer, T., Tucak, Z. (2004): Agrarna zoologija, II. dopunjeno izdanje. Školska knjiga, Zagreb.
6. Habdija, I., Primc Habdija, B., Radanović, I., Špoljar, M., Matoničkin Kepčija, R., Vujčić Karlo, S., Miliša, M., Ostojić, A., Sertić Perić, M. (2011): Protista – Protozoa i Metazoa – Invertebrata strukture i funkcije. Alfa d.d., Zagreb.
7. Bogut, I., Grbavac, J., Križek, I. (2013): Morfofiziologija probavnog sustava domaćih životinja i riba. Poljoprivredni fakultet, Osijek, Agronomski i prehrambeno-tehnološki fakultet, Mostar.

Additional literature

1. Lepeduš, H., Cesar, V. (2010): Onove biljne histologije i anatomije vegetativnih organa. Odjel za biologiju, Sveučilište J.J. Strossmayer u Osijeku

2. Matoničkin, I., Klobučar, G., Kučinić, M. (2010): Opća zoologija. Školska knjiga, Zagreb
3. Burnie, D. (2014): Životinje, velika ilustrirana enciklopedija, 3. izdanje. Mozaik knjiga, Zagreb

BASICS OF AGRICULTURAL ECONOMICS		
Coordinator	Krunoslav Zmaić	
Collaborators	Tihana Sudarić David Kranjac	
Study year and semester	1st year, 1st semester	
Number of credits and mode of delivery	ECTS credits	6
	Contact hours (L+E+S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	To acquaint the candidates with the impact of economic laws on the behavior of economic phenomena through social reproduction and the role of agriculture in overall economic development.	
Course enrolment requirements	No preconditions	

Intended course learning outcomes

Upon successful completion of the module, the student will be able to:

1. Explain the meaning and functions of agriculture in economic development.
2. Interpret the specific characteristics of agriculture and the laws governing production, distribution, exchange, and consumption.
3. Compare total, average, and marginal relationships in production functions.
4. Relate production isoquants and isocost curves, as well as the marginal rate of technical substitution, perfect substitutes, and complementary factors.
5. Calculate economic performance indicators.
6. Propose and compare selected thematic areas from various fields of agricultural economics.

Assessment and evaluation of student work during classes

Eligibility to take the final exam is granted by accumulating a minimum number of grading points. These points are earned based on class attendance (at least 70%), participation in class activities, tasks during lectures and seminars, seminar evaluations, and grades from partial exams. During the semester, students are required to complete a seminar paper. The seminar paper must be presented orally, lasting between 10 and 15 minutes, accompanied by a PowerPoint presentation. The schedule for presentations will be arranged in advance. Additionally, students will take two partial exams (in the 7th and 15th weeks of the course). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final grade. The final exam may be written or oral.

Obligatory literature

1. Zmaić, K. (2008): Osnove agroekonomike, Poljoprivredni fakultet u Osijeku. Osijek.
2. Baban Lj. (1999): Ogledi iz agrarne ekonomije. Ekonomski fakultet u Osijeku. Osijek.
3. Karić, M., Štefanić I. (1999): Troškovi i kalkulacije. Ekonomski fakultet u Osijeku. Osijek.

Additional literature

1. Gail L. Cramer and Clarence W. Jensen (1982): Agricultural Economics & Agribusiness. Second edition. Montana State University. New York.
2. Grgić, I., Franić, R., Cerjak, M., Mikuš, O., Hadelan, L., Mesić, Ž., Zrakić, M., Bokan, N. (2017): Priručnik iz agrarne ekonomike. Pojmovnik i osnovne metode. Zagreb: Sveučilište u Zagrebu, Agronomski fakultet
3. Žaja, M. (1991): Ekonomika proizvodnje, Školska knjiga, Zagreb.

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Mario Keškić	
Collaborators	-	
Study year and semester	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	1
	Number of hours (L+E+S)	30 (30E)
COURSE DESCRIPTION		
Course aims	The aim of Physical and Health Education is to train students to implement theoretical and motor skills that enable independent physical exercise for an improved quality of life.	
Course enrolment requirements		
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Independently perform physical exercises for an improved quality of life.		
Assessment and evaluation of student work during classes		
Attendance in classes, active participation during the teaching process, and participation in practical exercises with a minimum attendance of at least 70% of the total hours grants the right to receive positive descriptive grade.		
Obligatory literature		
Additional literature		

ENGLISH LANGUAGE II		
Coordinator	Tihomir Živić	
Collaborators	-	
Study year and semester	1st year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	5
	Contact hours (L+E+S)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	The development of listening, speaking, reading, and writing skills, as well as the correct use of grammatical and vocabulary structures in American English within the context of agrobiotechnical studies.	
Course enrolment requirements	No preconditions	

Intended course learning outcomes

Upon successful completion of the module, students will be able to:

1. Recognize and independently explain key Anglo-American terms relevant to their specific fields in authentic (didactic) Anglo-American scientific and professional texts.
2. Utilize prescribed specialist literature and multimedia sources at all levels (business promotional texts, product labels, instructions, and scientific articles).
3. Understand and translate technical texts in American English.
4. Communicate accurately in American English within the context of agrobiotechnical studies.
5. Present agrobiotechnical content accurately in American English.

Assessment and evaluation of student work during classes

Eligibility to take the final oral exam is granted by accumulating a minimum number of assessment points. These points are earned through attending at least 70% of classes (i.e., lectures and auditory exercises), active participation in class, and grades from partial written exams. During the semester, students will take two partial written exams (in the 7th and 15th weeks of the course). The final exam is mandatory, and a passing grade on the final exam is a prerequisite for a positive final course grade.

Obligatory literature

1. Bratulić, Mirna. *Found in Translation: Handbook with Exercises*. Hrvatska sveučilišna naklada, 2010.
2. Gačić, Milica. *Gramatika engleskoga jezika struke*. Školska knjiga, 2009.
3. Murphy, Raymond, i dr. *Basic Grammar in Use Student's Book with Answers and Interactive eBook: Self-study Reference and Practice for Students of American English*. 4. izd., Cambridge UP, 2017.
4. Perković, Anica. *English in Agriculture*. Poljoprivredni fakultet Osijek, 2011.
5. Vujčić, Jasna, i Anica Perković. *English for Horticulturists*. Veleučilište u Slavonskome Brodu / Poljoprivredni fakultet Osijek, 2011.

Additional literature

1. Filipović, Rudolf. *Veliki englesko-hrvatski rječnik*. Školska knjiga, 2017.
2. Hlavac, Jim, i dr. *Translating from Croatian into English: A Handbook with Annotated Translations*. Hrvatska sveučilišna naklada, 2019.
3. Matas, Đurđa. *Četverojezični rječnik iz poljoprivrede, šumarstva, veterine i primijenjene biologije: hrvatsko-njemačko-englesko-latinski*. Profil, 1999

GERMAN LANGUAGE II		
Coordinator	Tihomir Živić	
Collaborators	-	
Study year and semester	First year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	5
	Hours (L+E)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	Development of listening, speaking, reading, and writing skills, as well as the correct use of grammatical and vocabulary structures in the German language for the agrotechnical field.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
Upon successfully completing the module, students will be able to: 1. Conduct an oral discussion based on a read text or a listened conversation in a foreign language. 2. Write a summary with a specified word count. 3. Interpret a text. 4. Apply acquired vocabulary and structures in a new context. 5. Use digital skills to gather information on a specific topic in a foreign language. 6. Analyze graphical data (tables, graphs, maps, etc.). 7. Write an essay or create a presentation on a related topic.		
Assessment and evaluation of student work during classes		
The right to take the final oral exam is earned by accumulating a minimum number of points. Points are obtained by attending at least 70% of classes (lectures and auditory exercises), active participation in class, and scores from partial written exams. During the semester, students take two partial written exams (in the 7th and 15th week of the semester). The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a final positive course grade.		
Obligatory literature		
1. Ertl, Josef et al. Tausend Fragen für den jungen Landwirt. 16. izd., Verlag Eugen Ulmer, 1996. 2. Glovacki-Bernardi, Zrinka. Gramatika njemačkog jezika—osnove. Školska knjiga, 2017. 3. Haensch, Günther, i Gisela Haberkamp de Anton. Wörterbuch der Landwirtschaft. Verlag Eugen Ulmer, 1996. 4. Kljaić, Jasenka. Hrvatsko-njemački praktični rječnik. Školska knjiga, 2017. 5. ———. Njemačko-hrvatski praktični rječnik. Školska knjiga, 1998. 6. Leitner, Hans. Njemačko-hrvatski rječnik glagola u kontekstu. Školska knjiga, 1998. 7. Marčetić, Tamara. Njemački za odrasle. Školska knjiga, 1997. 8. Matas, Đurđa. Četverojezični rječnik hrvatsko-njemačko-englesko-latinski: oko 60.000 leksičkih jedinica iz poljoprivrede, šumarstva, veterine, primijenjene biologije. Profil International, 1999.		
Additional literature		
1. Bašić, Zlatko. Veliki hrvatsko-njemački rječnik gospodarskog, pravnog, političkog i svakodnevnog stručnog nazivlja. Bašić, 2000. 2. Marčetić, Tamara. Njemački u komunikaciji. Školska knjiga, 2005. 3. Matas, Đurđa. Zoološki rječnik hrvatsko-njemačko-englesko-latinski. Školska knjiga, 2009.		

PRINCIPLES OF ANIMAL BREEDING		
Coordinator	Vesna Gantner	
Collaborators	Mirna Gavran.	
Study year and semester	First year, 2nd semester	
Number of credits and mode of delivery	ECTS credits	6
	Hours (L+E)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	The goal is to introduce undergraduate students to the basics of domestic animal breeding, which include the origin of domestic animals and breeds, the causes and importance of hereditary and non-hereditary variability of general and productive traits, in order to understand breeding and selection methods.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Explain the importance and role of livestock farming as an agricultural and scientific discipline.
2. Describe the domestication process and the concept of domestic animals.
3. Identify the concept of breed, phenotype, and genotype.
4. Differentiate between the causes of hereditary and non-hereditary variability of domestic animal traits.
5. Explain the importance of fertility, as well as growth and development capacity from both a biological and economic perspective.
6. Apply basic statistical methods to describe variability and the relationships of quantitative traits.
7. Differentiate between general and productive traits of domestic animals.
8. Describe methods of breeding domestic animals.
9. Distinguish between the general principles of breeding programs.

Assessment and evaluation of student work during classes

Attendance at lectures and exercises, as well as active participation in class are required. During the semester, two partial written exams will be held (theory + tasks). At the first lecture, the student will be introduced to the course content (list of topics), the schedule for partial exams, and the list of mandatory and recommended literature. The partial exam results will be recognized during the final exam. Only students who have attended at least 70% of the lectures and exercises are eligible to take the partial and final written exams.
Method of Forming the Final Grade: In forming the final grade, continuous monitoring of attendance (activity in class, preparation for the topics), continuous checking of knowledge (partial exams), and the final exam are taken into account. Attendance at partial exams is not mandatory, while attending the final exam is mandatory.

Obligatory literature

1. Kralik, Gordana; Adámek, Zdeněk; Baban, Mirjana; Bogut, Ivan; Gantner, Vesna; Ivanković, Stanko; Katavić, Ivan; Kralik, Davor; Kralik, Igor; Margeta, Vladimir; Pavličević, Jerko. (2011) Zootehnika. Poljoprivredni fakultet u Osijeku, Sveučilište Josipa Jurja Strossmayera u Osijeku. Osijek: Grafika Osijek. Sveučilišni udžbenik. ISBN: 978 – 953 – 6331 – 95 – 6
2. Gantner, Vesna; Barać Zdravko. (2014) Uzgojno-selekcijski rad u stočarstvu. Poljoprivredni fakultet u Osijeku, Sveučilište Josipa Jurja Strossmayera u Osijeku. Sveučilišni udžbenik. ISBN: 978 – 953 – 7871 – 35 – 2
3. Gantner, Vesna; Steiner, Zvonimir; Gregić Maja (2021) Principles of Animal Breeding and Feeding. Josip Juraj Strossmayer University of Osijek, Faculty of Agrobiotechnical Sciences Osijek. Sveučilišni udžbenik. ISBN: 978 – 953 – 7871 – 97 – 0

Additional literature

1. Brinzej et al. (1991) Stočarstvo - poglavlje 1. Sveučilišni udžbenik. Školska knjiga. Zagreb
2. Jovanovac, S. (2013) Principi uzgoja životinja. Sveučilišni udžbenik, Osijek, 2013.

Recent scientific and professional papers from the field of animal production, selection and breeding of domestic animals.

AGRO-CLIMATOLOGY AND BASICS OF PHYSICS		
Coordinator	Danijel Jug	
Collaborators	Bojan Stipešević Bojana Brozović	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	L-55, E-10, S-10
COURSE DESCRIPTION		
Course aims	Introduce the student to the fundamentals of physics, basic meteorological elements, their measurement, and their impact on plant production.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Identify, define, and describe the most important physical phenomena, conditions, and principles that directly or indirectly influence the occurrence of meteorological and climatological elements. 2. Identify and describe the most important meteorological elements and explain their impact on plants and animals. 3. Propose and select optimal solutions for modifying and adapting meteorological conditions in the environment of plants and animals. 4. Describe the importance of agroclimatic indicators in agricultural production. 5. Describe and calculate key agroclimatic indicators and indices used in plant production. 6. Calculate active and effective temperature sums, Growing Degree Units (GDU), Corn Heat Units (CHU), and create climate diagrams. 7. Apply the analysis of meteorological data to create scientific and professional reports. 8. Comment on a given topic in agroclimatology with reasoned and critical analysis.		
Assessment and evaluation of student work during classes		
Eligibility to take the final exam is achieved by accumulating the minimum required number of assessment points. Assessment points are earned based on class attendance (at least 70 %), participation in class, grades from seminar papers, 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 passing grade on the final exam is a prerequisite for a passing final grade. The final exam is oral.		
Obligatory literature		
1. Penzar, I., Penzar B. (2000): Agrometeorologija, Školska knjiga, Zagreb. 2. Jug D., Stipešević, B., Jug, I., Mesić, M. (2011): Agroklimatološki pojmovnik. Poljoprivredni fakultet u Osijeku, Priručnik.		
Additional literature		
1. Penzar B. i sur. (1996): Meteorologija za korisnike, Školska knjiga, Zagreb. 2. Penzar, I., Penzar B. (1989): Agroklimatologija, Školska knjiga, Zagreb.		

BASICS OF PLANT PRODUCTION		
Coordinator	Bojan Stipešević	
Collaborators	Danijel Jug Bojana Brozović Miro Stošić	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (L-65, E - 10, S – 10)
COURSE DESCRIPTION		
Course aims	Introduce the students with the basic factors of plant production, the basics of the agrotechnical complex, tillage, machines for tillage, sowing, plant protection, plant production systems (crop rotation, free crop rotation, monoproduction), introduction to ecological agriculture.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Explain the interaction between agricultural production and environment 2. Manage the agroecosystem in accordance with GAP 3. Distinguish different plant production systems 4. Choose and combine different plant production systems 5. Calculate the necessary parameters for plant production (amounts of seed/planting material, fertilizers, fuel, etc.)		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the minimum number of assessment points. Assessment points are earned on the basis of class attendance (minimum 70%), class activities, seminar paper and grades from partial exams. During the semester, students take two partial exams (in the 8th and 15th week of 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. Mihalić, V., (1988) Opća proizvodnja bilja, udžbenik, Školska knjiga, Zagreb. str. 395. 2. Žugec, I., Bertić, B., Jurić, I., Šamota, D., Stipešević, B. (1996a): Vježbe, I dio, Agroklimatski pokazatelji. Interna skripta, Poljoprivredni fakultet, Osijek, str. 89.3. 3. Žugec, I., Bertić, B., Jurić, I., Šamota, D., Stipešević, B. (1996b): Vježbe, II dio, Gnojidba, Sjetva- sadnja, Tehnika uvođenja i izrade plodoreda, Evidencija agrotehničkih mjera na gospodarstvu. Interna skripta, Poljoprivredni fakultet, Osijek, str. 94. 4. Žugec, I., Bertić, B., Jurić, I., Šamota, D., Stipešević, B. (1996c): Vježbe, III dio, Fizikalno-mehanička svojstva tla (agrikulturna mehanika tla). Interna skripta, Poljoprivredni fakultet, Osijek, str. 103. 5. Kisić, I., 2014: Uvod u ekološku poljoprivredu, Agronomski fakultet, Zagreb, str. 340. 6. Jug, I., Jug, D, Brozović, B., Vukadinović, V., Đurđević, B. (2022): Osnove tloznanstva i biljne proizvodnje. Sveučilišni udžbenik Fakulteta agrobiotehničkih znanosti Osijek, Osijek. str. 399.		
Additional literature		
1. Znaor, D, 1996: Ekološka poljoprivreda, Globus, Zagreb, str. 469. 2. Scientific and professional papers from relevant journals.		

AGRICULTURAL MELIORATIONS		
Coordinator	Monika Marković	
Collaborators		
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	The aim is to educate students about agricultural land meliorations, including the necessary steps for organizing agricultural land and production spaces. Additionally, we will cover fundamental agronomic and hydrotechnical measures commonly employed in practice.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Calculate and recalculate measurement units and tasks applied in agriculture.
2. Explain the problem of an unregulated water - air regime in agricultural soils.
3. Specify the consequences of excess water and lack of water in agriculture.
4. Explain the functionality of drainage and irrigation.
5. Define methods for drainage and irrigation.
6. Choose and propose methods for drainage and irrigation.
7. Determine the elements of irrigation.

Assessment and evaluation of student work during classes

The right to access the final exam is achieved by collecting the 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 two partial exams (in the 7th and 15th week 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. Mađar, S. (1986): Odvodnja i navodnjavanje u poljoprivredi, Zadrugar, Sarajevo
2. Madjar, S., Šoštarić, J., (2009): Navodnjavanje poljoprivrednih kultura. Sveučilište J. J. Strossmayer, Poljoprivredni fakultet Osijek, Osječko-baranjska županija. Kroomopak d.o.o. Valpovo
3. Kos Z. (1989): Hidrotehničke melioracije tla - odvodnja i navodnjavanje, Školska knjiga, Zagreb
4. Tomić, F. (1988): Navodnjavanje. Fakultet poljoprivrednih znanosti, Zagreb
5. Ondašek G., Petošić D., Tomić F., Mustać Ivan, Filipović Vilim, Petek M., Lazarević B., Bubalo Marina: Voda u agroekosustavima. Sveučilište u Zagrebu, Agronomski fakultet, Zagreb 2015
6. Petošić: (2015): Drenaža. Sveučilište u Zagrebu, Agronomski fakultet, Zagreb 2015.

Additional literature

1. Grupa autora: Priručnik za hidrotehničke melioracije I Kolo Odvodnjavanje Knjiga 1-6. Društvo za odvodnju i navodnjavanje Hrvatske Zagreb
2. Grupa autora: Priručnik za hidrotehničke melioracije II Kolo Navodnjavanje Knjiga 1-6. Društvo za odvodnju i navodnjavanje Hrvatske Zagreb

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Mario Keškić	
Collaborators	-	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	1
	Number of hours (L+E+S)	30 (30E)
COURSE DESCRIPTION		
Course aims	The aim of Physical and Health Education is to train students to implement theoretical and motor skills that enable independent physical exercise for an improved quality of life.	
Course enrolment requirements		
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Independently perform physical exercises for an improved quality of life.		
Assessment and evaluation of student work during classes		
Attendance in classes, active participation during the teaching process, and participation in practical exercises with a minimum attendance of at least 70% of the total hours grants the right to receive positive descriptive grade.		
Obligatory literature		
Additional literature		

AGRICULTURAL MECHANISATION IN PLANT PRODUCTION		
Coordinator	Đuro Banaj	
Collaborators	Vjekoslav Tadić Anamarija Banaj	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (L- 60, E - 15, S – 0)
COURSE DESCRIPTION		
Course aims	Familiarizing students with the latest advancements in the development of technical systems in plant production, as well as the potential applications of these systems in new agricultural technologies.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. To enumerate the basic tasks of technical systems during basic and supplementary tillage. 2. Describe the factors that influence the selection of agricultural machinery and the possibilities for their aggregation. 3. List the basic technical systems and methods for their adjustment. 4. Differentiate between technical systems, types, and additional equipment associated with them. 5. Select technical systems based on the requirements of the applied cultivation technology.		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the 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 partial exams. 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.		
Obligatory literature		
1. Banaj, Đ., Tadić, V., Banaj Željka, Lukač., P.(2013): Unapređenje tehnike aplikacije pesticida, Poljoprivredni fakultet u Osijeku, Osijek, 2. Zimmer, R., Košutić, S., Zimmer, D. (2009.): Poljoprivredna tehnika u ratarstvu, Udžbenik Sveučilišta J. J. Strossmayera u Osijeku, 3. Banaj, Đ., Šmrčković P. (2003): Upravljanje poljoprivrednom tehnikom, Poljoprivredni fakultet, Osijek, 4. D. Brkić, M. Vujčić, L. Šumanovac, T. Jurić, P. Lukač, D. Kiš, D. Knežević (2005): „Eksploatacija poljoprivrednih strojeva", udžbenik, Poljoprivredni fakultet u Osijeku, Osijek 2005., ISBN 631.316 (075.8), 5. Brkić, D., Vujčić, M., Šumanovac, L. (2002): Strojevi za žetvu i berbu zrnatih plodina, Poljoprivredni fakultet Osijek, Vinkovci		
Additional literature		
1. Znaor, D.: Ekološka poljoprivreda, Nakladni zavod Globus, Zagreb, 1996, 2. Sito, S., Bilandžija, N. (2013): Tehnika u voćarstvu i vinogradarstvu, Interna skripta, Agronomski fakultet u Zagrebu, 3. Lukač, P., Pandurović, T. (2011): Strojevi za berbu voća i grožđa, Poljoprivredni fakultet u Osijeku,		

GENETICS		
Coordinator	Sonja Petrović	
Collaborators	-	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+P+S)	75 (L- 45, P - 30, S - 0)
COURSE DESCRIPTION		
Course aims	Introduce students to the basic mechanisms of inheritance of qualitative and quantitative traits in plants and animals.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Describe and recognize prokaryotic and eukaryotic cell components and their role in the cell cycle and during reproduction (identify and compare differences between mitosis and meiosis; recognize and compare reproductive cycles and alternation of generations).
2. Describe and explain the structure of DNA and RNA and their differences; understand the genetic code and the principles of protein synthesis.
3. Explain Mendelian principles of inheritance, interactions of non-allelic genes, and the influence of sex on gene expression.
4. Explain and recognize gene linkage on chromosomes through calculating and constructing chromosome maps.
5. Describe and recognize various changes in the number and structure of chromosomes, and explain how they occur.
6. Compare the effects of one or more genes from a population perspective; calculate changes in gene and genotype frequencies, and describe the formation of species and genus hybrids.
7. Apply acquired knowledge of complex inheritance mechanisms; recognize and predict different types of inheritance when solving problem tasks.
8. Explain, recognize, and apply the basic parameters of quantitative genetics fundamentals using examples.

Assessment and evaluation of student work during classes

In determination of the student's final grade, continuous class participation is taken into account (class activity, preparation for class, independent assignments), as well as continuous monitoring and assessment of knowledge (partial exams) and the final exam score. Class attendance is mandatory in accordance with the Regulations on Studies and Studying at the Josip Juraj Strossmayer University of Osijek.

Obligatory literature

1. Borojević, Slavko i Katarina Borojević (1976): Genetika, Novi Sad
2. Kraljević-Balalić, M.; Petrović, S.; Vapa, Lj. (1991): Genetika, teorijske osnove sa zadacima, Novi Sad
3. Pavlica M., Mrežni udžbenik iz Genetike, http://www.genetika.biol.pmf.unizg.hr/

Additional literature

1. Tamarin R. H. (1999) Principles of Genetics (sixth edition). WCB McGraw-Hill.
2. Klug W. S., Cummings M. R., Spencer C. A., Palladino M. A. (2011): Concepts of Genetics (10th edition), Pearson
3. Borojević, Slavko (1981): Principi i metodi oplemenjivanja bilja, Novi Sad

PEDOLOGY		
Coordinator	Domagoj Rastija	
Collaborators	Vladimir Zebec	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	To introduce students with the importance of soil and its properties from pedogenetic, pedological and agroecological aspects, as well as the principles and methods of determining parameters important for soil fertility.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Recognize pedogenetic processes based on the morphological characteristics of the soil
2. Describe the physical and chemical properties of soil
3. Determine the limitations regarding soil properties
4. Conduct soil sampling in both degraded and undisturbed conditions in the field.
5. Determine the basic physical and chemical properties of soil in the laboratory

Assessment and evaluation of student work during classes

The right to access the final exam is achieved by collecting the 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 two partial exams. 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. Husnjak, S. (2022): Osnove pedologije. Sveučilište u Zagrebu Agronomski fakultet.
2. Martinović, J. (2000): Tla u Hrvatskoj. DUZPO. Zagreb.
3. Husnjak, S. (2014); Sistematika tala Hrvatske. Hrvatska sveučilišna naklada Zagreb
4. Škorić, A. (1986): Postanak, razvoj i sistematika tla. Fakultet Poljoprivrednih znanosti. Zagreb
5. Herak, M. (1984): Geologija. Školska knjiga. Zagreb.
6. Škorić, A. (1991): Sastav i svojstva tla. Fakultet Poljoprivrednih znanosti. Zagreb.
7. Martinović, J. (1997): Tloznanstvo u zaštiti okoliša, priručnik za inženjere. DUZO. Zagreb

Additional literature

1. FAO (1996): Agro-ecological Zoning, Guidelines. Food and Agriculture Organizations of the United Nations. Rome.
2. FAO (1976): A Framework for Land Evaluation. Food and Agriculture Organizations of the United Nations. Rome.
3. Škorić, A. (1982): Priručnik za pedološka istraživanja. Fakultet Poljoprivrednih znanosti. Zagreb.
4. xxx (1995): Soil Survey Laboratory Information Manual. Soil Survey Investigations Report No.45. Version 1.0. U.S. Department of Agriculture. National Soil Survey Center.
5. Kohnke, H. (1968): Soil physics. McGraw-Hill Book Company. New York.

PLANT PHYSIOLOGY		
Coordinator	Tihana Teklić	
Collaborators	Miroslav Lisjak Dejan Agić	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	75 (60L+15E+0)
COURSE DESCRIPTION		
Course aims	Familiarize students with the significance of organic and inorganic compounds in plant metabolism, the transformation of substances and energy in plants, and the impact of environmental factors on plant growth and development, from the cellular level to the ecosystem level.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Describe and explain the role of the most important physiologically active components in plant metabolism. 2. To connect the processes of synthesis and decomposition of organic matter in plants, taking into account the specificity of the plant species, stages of development and growing conditions. 3. Evaluate the dynamics of plant growth by measuring specific indicators, monitor yield formation and explain the impact of environmental factors on plant productivity. 4. Recognize the occurrence of abiotic stress and assess the plant's reaction to stress and choose measures to prevent or reduce the consequences of stressful growing conditions.		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the 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 (in the 5th, 10th and 15th week of 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.		
Obligatory literature		
1. Berg, J. M., Tymoczko, J. L., Stryer, L. (2013): Biokemija. 6. englesko izdanje i 1. hrvatsko izdanje. Školska knjiga, Zagreb. 2. Bešlo, D. (2014): Praktikum iz biokemije, Poljoprivredni fakultet Osijek. 3. Teklić, T. (2012): Fiziologija bilja. Skripta, Poljoprivredni fakultet Osijek. 4. Lazarević, B., Poljak, M. (2019): Fiziologija bilja. Agronomski fakultet, Zagreb. 5. Lisjak, M., Špoljarević, M., Agić, D., Andrić, L. (2009): Praktikum iz fiziologije bilja. Poljoprivredni fakultet Osijek.		
Additional literature		
1. Pevalek-Kozlina, B. (2003): Fiziologija bilja. Profil International. Zagreb.		

GENERAL MICROBIOLOGY		
Coordinator	Gabriella Kanižai Šaric	
Collaborators	-	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	75 (50P + 25V)
COURSE DESCRIPTION		
Course aims	Familiarize undergraduate students with the fundamental principles of microbiology, provide an understanding of the microbial world, highlight the central role of microorganisms in nature, and emphasize their importance in our daily lives.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Differentiate the basic categories of microorganisms 2. Explain the differences in the structure and function of prokaryotic and eukaryotic cells 3. Differentiate between environmental factors and their impact on microorganisms 4. Understand the basics of microbial metabolism and the metabolic differences between microorganisms. 5. Explain the importance and role of microorganisms in microbiological processes in the soil. 6. Distinguish and understand the importance of microorganisms in the hydrosphere, atmosphere and biosphere.		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the minimum number of assessment points. Assessment points are earned on the basis of class attendance (minimum 70%), class and practice activities and grades from partial exams. During the semester, students take two partial exams. 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. Duraković, S., Redžepović, S. (2002): Uvod u opću mikrobiologiju. Kugler, Zagreb. 2. Jarak, M., Govedarica, M. (2003). Mikrobiologija. Univerzitet u Novom Sadu, Poljoprivredni fakultet. 3. Kastori, R. (ur.) (2005): Azot, agrohemijski, agrotehnički, fiziološki i ekološki aspekti. Naučni institut za ratarstvo i povrtarstvo, Novi Sad. 4. Duraković, S. (1996): Opća mikrobiologija. Prehrambeno tehnološki inženjering, Zagreb. 5. Duraković, S., Duraković, L. (1998): Priručnik za rad u mikrobiološkom laboratoriju, I. dio knjiga prva, Durieux, Zagreb. 6. Duraković, S., Duraković, L. (1998): Priručnik za rad u mikrobiološkom laboratoriju, I. dio knjiga druga, Durieux, Zagreb. 7. Kanižai Šarić G. (2015). Praktikum iz opće mikrobiologije, Poljoprivredni fakultet Osijek.		
Additional literature		
1. Duraković, S. (1996): Primjenjena mikrobiologija. Prehrambeno tehnološki inženjering, Zagreb.		

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Mario Keškić	
Collaborators	-	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS credits	1
	Number of hours (L+E+S)	30 (30E)
COURSE DESCRIPTION		
Course aims	The aim of Physical and Health Education is to train students to implement theoretical and motor skills that enable independent physical exercise for an improved quality of life.	
Course enrolment requirements		
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Independently perform physical exercises for an improved quality of life.		
Assessment and evaluation of student work during classes		
Attendance in classes, active participation during the teaching process, and participation in practical exercises with a minimum attendance of at least 70% of the total hours grants the right to receive positive descriptive grade.		
Obligatory literature		
Additional literature		

PLANT NUTRITION		
Coordinator	Zdenko Lončarić	
Collaborators	Boris Đurđević	
Study year and semester	Vladimir Ivezic	
Point value and method teaching	Second year, IV.	
	ECTS coefficient	5
	Number of hours (L+E+S)	L- 55, E - 20, S - 0
COURSE DESCRIPTION		
Course aims	Familiarize students with the processes in soil and plants of a physical, chemical, physiological, and biochemical nature that influence the uptake, movement, and distribution of nutrients in the interaction between plants and substrates. Course Plant nutrition provides knowledge about primary organic production in the soil-plant-atmosphere system, with an emphasis on yield quantity and quality.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Explain the classification of chemical elements with respect to their significance for plant nutrition..
2. Explain soil fertility, and the status and dynamics of nutrients in the soil.
3. Interpret the impact of soil fertility and nutrient content in plants on plant productivity, growth dynamics, and yield formation.
4. Organize and carry out basic chemical analyzes of the soil, and interpret the results of the analyses.
5. Explain the process of nutrient adoption.
6. Explain the chemical properties of the soil, and interpret the physiological role of primary and secondary macro elements, microelements, useful elements and toxic elements in plants.
7. Organize and carry out chemical analyzes of the soil.
8. Interpret results of soil analysis.

Assessment and evaluation of student work during classes

The right to take the final exam is obtained by accumulating a minimum number of assessment points. assessment points are earned based on class attendance (at least 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 passing grade on the final exam is a prerequisite for a passing overall grade. The final exam is oral.

Obligatory literature

1. Vukadinović V. i Lončarić Z. (1997): Ishrana bilja, Sveučilište u Osijeku, Poljoprivredni fakultet u Osijeku.
2. Lončarić, Z. (2005): Program vježbi iz kolegija "Ishrana bilja". Praktikum za studente. Interna skripta. Poljoprivredni fakultet Sveučilišta u Osijeku. Osijek.
3. Lončarić, Z. (2017): Kretanje i usvajanje hraniva. Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Vukadinović, V. i Vukadinović V. (2012): Ishrana bilja. Sveučilište u Osijeku, Poljoprivredni fakultet u Osijeku.
2. Vukadinović V. i Bertić B. (1988.): Praktikum iz agrokemije i ishrane bilja. Poljoprivredni fakultet u Osijeku.
3. FAO (2003): Assessment of soil nutrient balance, Approaches and methodologies. Rome (http://www.fao.org)

PHYTOPATHOLOGY I		
Coordinator	Karolina Vrandečić	
Collaborators	Jasenka Ćosić Đuro Banaj Tamara Siber	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	75 (55L + 10E + 10S)
COURSE DESCRIPTION		
Course aims	To acquainte of students with the basic terms and fundamental principles of general phytopathology and systematics of fungi with examples of the most important disease.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Recognize symptoms in diseased plants (abiotic and biotic agents). 2. Describe and identify systematic units of fungi. 3. Explain the influence of environmental factors on causative agent of disease. 4. Select appropriate methods for suppuration plant parasites. 5. Describe defensive reactions in diseased plants. 6. Identify and describe the most significant disease agents. 7. Group and propose measures of protection. 8. Discuss, argue, and critically assess a given topic related to the seminar paper.		
Assessment and evaluation of student work during classes		
Obligatory literature		
1. Agrios, G.N. (2005): Plant Pathology. Edition, 5. Publisher, Academic Press. 2. Kišpatić, J. (1992.): Opća fitopatologija. Agronomski fakultet Zagreb. 3. Cvjetković, B. (2010): Mikoze i pseudomikoze voćaka i vinive loze. Zrinski, Čakovec. 4. Jurković, D., Ćosić, J., Vrandečić, K. (2010.: Bolesti cvijeća i ukrasnog bilja. Poljoprivredni fakultet u Osijeku. 5. Maceljski, M., Cvjetković, B., Ostojić, Z., Igric-Barčić, J., Pagliarini, N., Ošterec, LJ., Barić, K., Čizmić, I. (2004): Štetočinje povrća. Zrinski, Čakovec		
Additional literature		
1. Glasilo biljne zaštite brojevi od 2001. godine do danas		

PRODUCTION OF INDUSTRIAL CROPS		
Coordinator	Manda Antunović	
Collaborators	Ivana Varga	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (P+E+S)	75 (60 P + 10 E + 5 S)
COURSE DESCRIPTION		
Course aims	Enable students to manage the production process of industrial crops and to pursue further improvement in this area.	
Course enrolment requirements	Pedology, Plants Physiology	

Intended course learning outcomes

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

1. Define the significance, origin, distribution, and use of industrial crops.
2. Compare areas under the industrial crops and average yields domestically and globally.
3. Describe the morphological characteristics, usage value, and chemical composition of the parts of the plant that are used (root, seed).
4. Differentiate between seeds (fruits) in their natural form and as processed for industrial crops.
5. Describe the requirements of industrial plants in terms of soil and weather conditions (temperature, water, light).
6. Define the significance of crop rotation and the position of individual crops within the rotation, as well as the importance of preceding crops.
7. Develop a tillage system for each industrial crop and define the impact of tillage on production outcomes.
8. Define the choice of agronomic measures based on the needs of industrial crops, soil type, crop rotation, and preceding crops.
9. Describe the importance of nutrient elements, the process of nutrient uptake, required quantities of nutrients, and the fertilization with organic and mineral fertilizers, as well as the impact of specific fertilizers on the quality and quantity of production.
10. Define the importance of planting dates, cultivar selection, plant spacing, and growing space in production.
11. Describe measures for protection and emphasize the importance of weed control, diseases and pests control, and irrigation.
12. Articulate the importance of harvest timing and storage on yield and product quality.and pests, and irrigation.

Assessment and evaluation of student work during classes

The right to access the final exam is achieved by collecting the minimum number of grade points. Grade points are earned on the basis of class attendance (minimum 70%), class activities and grades from partial exams. During the semester, students take two partial exams. The final exam is mandatory, and the prerequisite for passing the final exam is a positive grade from the seminar paper. A positive grade from the final exam and seminar paper is a prerequisite for a positive final grade. The final exam is oral/written.

Obligatory literature

1. Pospišil, M. (2013): Ratarstvo II dio - industrijsko bolje, Zrinski d.d. Čakovec.
1. Pospišil, A. (2010): Ratarstvo - I dio. Zrinski d.d. Čakovec.

Additional literature

1. Vratarić M. i sur. (2004): Suncokret. Poljoprivredni institut Osijek.
2. Vratarić M., Sudarić A. (2008): Soja. Poljoprivredni institut Osijek.

ENTOMOLOGY I		
Coordinator	Ivana Majić	
Collaborators	Ankica Sarajlić Josipa Puškarić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS	6
	Number of hours (L+E+S)	75 (45L+30S)
COURSE DESCRIPTION		
Course aims	Familiarize students with the most significant insects and other pests in agriculture, with an emphasis on their morphology, physiology, and biology, as well as the symptoms of plant damage and the control measures related to specific pests.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Describe the role of insects in agriculture, state the biological characteristics of insects and ecological factors important for their development
2. Connect the structure of insects with the symptoms of damage on plants.
3. Recommend zoocides for the purpose of controlling harmful organisms.
4. Suggest the most effective method for pest control.
5. Describe the morphology and physiology of the most significant orders of insects in agriculture.
6. Identify other animal groups that cause damage in agriculture.
7. Explain the methods for collecting insects as well as their preparation and storage.

Assessment and evaluation of student work during classes

Attending classes is mandatory in accordance with the Ordinance on Studies at J. J. Strossmayer University in Osijek. In the second part of the semester, students must collect 20 insects, a maximum of 3 from the same order. Insects must be attached into a form, on which the orders to which the insects belong are noted. Collecting insects is mandatory for the final grade. During the semester, there will be two written partial exams from the exercises and two partial exams from the lectures. At the beginning of the semester, students will be informed of the dates of partial exams. Final exam is mandatory.

Obligatory literature

1. Maceljski, M., Cjetković, B., Ostojić, Z., Igrc-Barčić, J., Pagliarini, M., Oštrec, Lj., Barić, K., Čizmić, I. (2004): Štetočinje povrća, Zrinski, Čakovec
2. Ivezić, M. (2008): Entomologija - kukci i ostali štetnici u ratarstvu, Sveučilište Josipa Jurja Strossmayera u Osijeku,
3. Maceljski, M. (2002): Poljoprivredna entomologija. Zrinski Čakovec
4. Oštrec, Lj., Gotlin Čuljak, T. (2005): Opća entomologija, Zrinski, Čakovec.
5. Igrc-Barčić J., Maceljski M. (2001): Ekološki prihvatljiva zaštita bilja od štetnika, Zrinski, Čakovec
6. Raspudić E., Brmež M., Majić I., Sarajlić A. (2014): Insekticidi u zaštiti bilja, Sveučilište Josipa Jurja Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku
7. Courtney Smithers (1981): The handbook of insect

Additional literature

1. Kovačević, Ž. (1950): Primjenjena entomologija, I knjiga : opći dio, Nakladni zavod Hrvatske Zagreb
2. Oštrec, LJ. (1998): Zoologija - štetne i korisne životinje u poljoprivredi, Zrinski, Čakovec.
3. Pedigo, P. L. (1996): Entomology & pest management. Prentince Hall Upper Saddle River, NJ 07458, USA
4. Gullan, P.J. & Cranson, P.S. (1994): The Insects, An Outline of Entomology. Chapman & Hall. (knjiga)
5. Uz ponuđenu literaturu studente će se stalno upućivati i na najnovije znanstvene radove na području entomologije kao dodatno pojašnjenje određene tematske cjeline

PLANT SYSTEMATICS		
Coordinator	Edita Štefanić	
Collaborators	Sanda Rašić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS points	5
	Number of hours (L + E)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	To familiarize students with the great diversity of the plant world and the basic characteristics of individual systematic groups, especially those that are significant for the field of agronomy.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Describe and explain the term "biological diversity" and evolution 2. Interpret the systematic classification of the plant world. 3. Distinguish and compare the most important plant families and species important for the agronomic profession 4. Prepare a herbarium and identify and classify the collected plants		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the minimum number of assessment points. Assessment points are earned on the basis of class attendance (minimum 70%), class activities and grades from partial exam. During the semester, students take three partial exams and independently collect plants for the herbarium. The final exam is mandatory.		
Obligatory literature		
1. Nikolić, T.(2013): Sistematska botanika. Alfa, Zagreb 1. Magdefrau, K., Ehrendorfer, F.(1984): Sistematika, evolucija, geobotanika. Školska knjiga, Zagreb		
Additional literature		
1. Hulina, N. (2011): Više biljke stablašice. Golden marketing- tehnička knjiga. Zagreb 2. Nikolić, T. (2013): Praktikum sistematske botanike. Alfa, Zagreb		

FERTILIZATION IN PLANT PRODUCTION		
Coordinator	Zdenko Lončarić	
Collaborators	Vladimir Ivezić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS points	ECTS points
	Number of hours (L+E+S)	Number of hours (L+E+S)
COURSE DESCRIPTION		
Course aims	To familiarize students with the reasons, goals, and principles of fertilization in crop production, as well as the basics of production, types, quality, and properties of mineral and organic fertilizers and conditioners. By mastering the planned curriculum, students will understand the need for fertilization and the selection of optimal fertilizers, the ecological and economic significance of fertilization, the principles of calculating necessary fertilization and soil conditioning in crop production, and will become acquainted with the basic computer programs used in Croatia for fertilizing agricultural crops.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Explain the reasons, tasks, principles and systems of fertilization from historical, ecological, technological and economic aspects. 2. Differentiate between types of fertilizers and conditioners according to different criteria. 3. Describe the chemical properties, forms of nutrients, and production and technological properties of the most significant mineral fertilizers. 4. Describe the physical, chemical and biological properties of organic fertilizers. 5. Use the principles for calculating the optimal quantity and dynamics of nutrient requirements for field crop species and soil conditioning. 6. Explain the results of basic soil analyses necessary for fertilization calculations.		
Assessment and evaluation of student work during classes		
The right to take the final exam is obtained by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (at least 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 passing grade on the final exam is a prerequisite for a passing overall grade. The final exam is oral.		
Obligatory literature		
1. Lončarić, Z., Parađiković, N., Popović, B., Lončarić, R., Kanisek, J. (2015): Gnojidba povrća, organska gnojiva i kompostiranje. Poljoprivredni fakultet Sveučilišta u Osijeku. 2. Lončarić, Z., Karalić, K. (2015.): Mineralna gnojiva i gnojidba ratarskih usjeva. Poljoprivredni fakultet Sveučilišta u Osijeku. 3. Lončarić, Z., Rastija, D., Karalić, K., Popović, B., Ivezić, V., Lončarić, R. (2015.): Kalcizacija tala u pograničnome području. Poljoprivredni fakultet Sveučilišta u Osijeku.		
Additional literature		
1. Lončarić, Z. (ur.) (2019.): Plodnost tala i gospodarenje organskim gnojivima. Osijek. Sveučilište Josipa Jurja Strossmayera u Osijeku Fakultet agrobiotehničkih znanosti Osijek. 2. Lončarić, Z., Rastija, D., Popović, B., Karalić, K., Ivezić, V., Zebec, V. (2014.): Uzorkovanje tla i biljke za agrokemijske i pedološke analize. Urednik: Lončarić, Z. Poljoprivredni fakultet Sveučilišta u Osijeku. 3. Lončarić, Z., Rastija, D., Baličević, R., Karalić, K., Popović, B., Ivezić, V. (2014.): Plodnost i opterećenost tala u pograničnom području. Poljoprivredni fakultet Sveučilišta u Osijeku.		

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Mario Keškić	
Collaborators	-	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	1
	Number of hours (L+E+S)	30 (30E)
COURSE DESCRIPTION		
Course aims	The aim of Physical and Health Education is to train students to implement theoretical and motor skills that enable independent physical exercise for an improved quality of life.	
Course enrolment requirements		
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Independently perform physical exercises for an improved quality of life.		
Assessment and evaluation of student work during classes		
Attendance in classes, active participation during the teaching process, and participation in practical exercises with a minimum attendance of at least 70% of the total hours grants the right to receive positive descriptive grade.		
Obligatory literature		
Additional literature		

BASICS OF CEREALS PRODUCTION		
Coordinator	Mirto Rastija	
Collaborators	Dario Iljkić	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	75 (60 P + 15 E)
COURSE DESCRIPTION		
Course aims	Familiarize students with the basics of cereal production, cereal morphological and biological properties, and agrotechnics for the most important cereals. Training for independent cereal production.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Classify cereals and explain their importance in agricultural production on the global level and the for the economy of Croatia 2. Describe the morphological and biological properties of cereals 3. Determine the stages of growth and development in cereals 4. Determine the needs of individual cereals for agroecological conditions during the life cycle 5. Describe the grain production technology 6. Recommend basic agrotechnical operations in the production of certain cereals		
Assessment and evaluation of student work during classes		
The right to access the final exam is achieved by collecting the 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 (in the 5th, 9th and 15th week of 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. Kovačević, V., Rastija, M. (2014): Žitarice. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku 2. Pospišil, A. (2010): Ratarstvo, I. dio. Zrinski, d.d., Čakovec 3. Pospišil, A., Pospišil, M. (2013): Ratarstvo - praktikum. Sveučilište u Zagrebu, Agronomski fakultet		
Additional literature		
1. Gotlin, J., Pucarić, A. (1979): Specijalno ratarstvo (I. dio). Sveučilišna naklada Liber, Zagreb. 2. Gotlin, J. i sur. (1967): Suvremena proizvodnja kukuruza. Agronomski glasnik, Zagreb. 3. Grupa autora. (1986): Posebno ratarstvo (I.dio). Naučna knjiga, Beograd. 4. Pucarić, A., Ostojić, Z., Čuljat, M. (1997): Proizvodnja kukuruza, Hrvatski zadružni savez, Zagreb.		

PRODUCTION OF FODDER PLANTS		
Coordinator	Gordana Bukvić	
Collaborators	Ranko Gantner Goran Herman	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS	5
	Number of hours (L+E+S)	75 (55 P + 15 E + 5 S)
COURSE DESCRIPTION		
Course aims	To acquaint students with the technology of fodder production in the agroecological conditions of the Republic of Croatia, the morphological and biological properties of the species, and the method of using and preserving fodder.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Valorize the importance and possibilities of fodder production in the agroecological conditions of the Republic of Croatia.
2. Organize the technology for the production of grain and legumes, as well as mixtures with cereals for the feeding of domestic animals.
3. To organize the technology of production of one-year forage legumes for grain and voluminous fodder.
4. To organize the production technology of perennial fodder legumes for the production of voluminous fodder and hay.
5. Differentiation of grass and leguminous seeds and their seedlings.
6. Organize the production technology of root fodder crops as well as the method of preserving roots during the winter period.
7. Organize the storage of hay, silage, and haylage.
8. Organize the establishment of sown pastures and the use of natural grasslands.
9. Distinguish between plant species in the pasture.

Assessment and evaluation of student work during classes

The right to access the final exam is achieved by collecting the 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. 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. Stjepanović, M., Štafa, Z., Bukvić, G. (2008): Trave za proizvodnju krme i sjemena. Hrvatska mljekarska udruga. Zagreb, Hrvatska.
2. Stjepanović, M., Steiner, Z., Domaćinović, M., Bukvić, G. (2002): Konzerviranje krme. Agroekološko društvo u Osijeku. Osijek, Hrvatska.
1. Gantner, R., Bukvić, G., Steiner, Z. (2021): Proizvodnja krmnog bilja. Sveučilište Josipa Jurja Strossmayera u Osijeku. Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Stjepanović, M., Zimmer, R., Tucak, M., Bukvić, G., Popović, S., Štafa, Z. (2009): Lucerna. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. Osijek, Hrvatska.
2. Stjepanović, M., Čupić, T., Gantner, R. (2012): Grašak. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. Osijek, Hrvatska.

PLANT BREEDING AND SEED PRODUCTION		
Coordinator	Sonja Vila	
Collaborators	Vlado Guberac Sunčica Kujundžić	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS points	5
	Number of hours (L+E+S)	75 P + 0 E + 0 S
COURSE DESCRIPTION		
Course aims	To introduce undergraduate students with the basics of plant breeding and the basics of seed and planting material production.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Explain the importance of plant breeding and seed production for agricultural production and ensuring sufficient amounts of food
2. Describe the basic steps and characteristics of the breeding process
3. Select suitable breeding methods for the specific plant species
4. Describe the biotechnological methods used in plant breeding
5. Describe the morphological, physiological and anatomical characteristics of seeds
6. Distinguish the basic categories of seeds, types of cultivars, and methodologies for approval.

Assessment and evaluation of student work during classes

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

Obligatory literature

1. Martinčić, J., Kozumplik, V. (1996): Oplemenjivanje bilja. Udžbenik. Sveucilište u Osijeku i Sveučilište u Zagrebu.
2. Guberac, V. (2000): Sjemenarstvo ratarskih kultura. Skripta. Poljoprivredni fakultet u Osijeku.
3. Milošević, M., Kobiljski, B. (2011): Semenarstvo I-III. Monografija. Institut za ratarstvo i povrtarstvo. Novi Sad.
4. Kozumplik, V., Pejić, I. (2012): Monografija Oplemenjivanje poljoprivrednog bilja u Hrvatskoj. Agronomski fakultet Sveučilišta u Zagrebu.
5. Martinčić, J., Marić, S. (1996): Oplemenjivanje bilja. Vježbovnik, Poljoprivredni fakultet u Osijek

Additional literature

1. Kolak, I. (1994): Sjemenarstvo ratarskih i krmnih kultura. Nakladni zavod Globus, Zagreb.
2. Ujević, A. (1988): Tehnologija dorade i čuvanje sjemena. Zagreb.
3. Skender, Ana, Knežević, Mira, Đurkić, Marija, Martinčić, J., Guberac, V., Kristek, A., Stjepanović, M., Bukvić, Gordana, Matotan, Z., Šilješ, I., Ivezić, Marija, Raspudić, Emilija, Horvat, D., Jurković, Draženka, Kalinović, Irma i Šamota, D. (1998): Sjemenje i plodovi poljoprivrednih kultura i korova na području Hrvatske. Sveučilište u Osijeku, Osijek.

STORAGE AND TECHNOLOGIES OF AGRICULTURAL PRODUCTS		
Coordinator	Vlatka Rozman	
Collaborators	Anita Liška, Pavo Lucicć	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS points	5
	Number of hours (L+E+S)	75 (55P + 10E + 10S)
COURSE DESCRIPTION		
Course aims	Familiarize students with the principles of proper storage of harvested agricultural products and the basics of their processing into final products..	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Explain the factors that affects the shelf life of stored products
2. Identify physiological processes during storage of agricultural products
3. Explain the physical properties of stored grains during storage
4. Group storage pests according to the damage they cause to stored products
5. Propose category and types of warehouses for individual agricultural products
6. Differentiate between the storage methods of cereals, oilseeds, root and tuberous crops, industrial and seed sugar beets, fine herbs, tobacco and hops

Assessment and evaluation of student work during classes

In forming the final grade for students, continuous monitoring of classes is taken into account (class activity, preparation for the lesson, reflective review of class content), continuous monitoring and checking of knowledge (1 colloquium, 1 seminar, 3 partial exams), and final written 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. Kalinović, I. (1997): Skladištenje i tehnologija ratarskih proizvoda. Interna skripta. Poljoprivredni fakultet,Osijek: Str:1-129.
2. Ritz, J. (1988): Osnovi uskladištenja ratarskih proizvoda. II izdanje. Sveučilište u Zagrebu, Fakultet poljoprivrednih znanosti, Zagreb:Str:1-231.
3. Rozman, V., Liška, A.: Skladištenje ratarskih proizvoda - priručnik za vježbe (web izdanje)
4. Rozman, V., Korunić, Z, Liška, A. (2020.). Kukci - gospodarski štetnici uskladištenih poljoprivrednih
5. proizvoda i hrane te prepoznavanje prema nastalim štetama. Zbornik predavanja DDD Trajna edukacija za izvoditelje obvezatnih mjera dezinfekcije, dezinsekcije i deratizacije i osobe u nadzoru - Cjelovito (integralno) suzbijanje štetnika hrane, uskladištenih poljoprivrednih proizvoda, predmeta opće uporabe te muzejskih štetnika. Zagreb, ur: Korunić, J. Str: 21-50. ISBN: 978-953¬7247-37-9

Additional literature

1. Korunić,Z. (1990): Štetnici uskladištenih poljoprivrednih proizvoda, biologija, ekologija i suzbijanje. Gospodarski list, Zagreb:starnice: 1-220.
2. Ritz, J. 1989: Uskladištenje krumpira. Zagreb:stranice: 1-50.
3. Svern, D.: 1972: Industrijski proizvodi bilja i masti po Baileyu (prijevod). Zagreb: stranice:1-200.
4. Marić, V., Nadvornik, Z. (1995): Pivo tekuća hrana. «Prosvjeta»,Bjelovar. Stranice:1-227.
5. Tadejević, V, Jakovlić, V. (1976): Poznavanje robe s osnovama tehnologije i nauke o ishrani. Školska knjiga,Zagreb. stranice:1-705.

PRINCIPLES OF PHYTOMEDICINE IN PLANT PRODUCTION		
Coordinator	Renata Baličević	
Collaborators	Marija Ravlić	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS points	3
	Number of hours (L+E+S)	35 (20 P + 15 E)
COURSE DESCRIPTION		
Course aims	Introducing students to the basics of phytomedicine and plant protection measures against harmful organisms.	
Course enrolment requirements	No enrolment requirements	

Intended course learning outcomes

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

1. Identify the objectives of proper application of plant protection products according to the current requirements of producers, and consumers, while adhering to legal frameworks.
2. Differentiate harmful organisms and apply adequate protection measures.
3. Understand the mechanisms of action of plant protection products.
4. Carry out the proper application of plant protection products while preventing environmental contamination.
5. Discuss, argue, and critically assess a given topic related to plant protection.

Assessment and evaluation of student work during classes

The right to access the final exam is achieved by collecting the 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 two partial exams. 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. Bokulić i sur. (2015): Priručnik za sigurno rukovanje i primjenu sredstava za zaštitu bilja. Ministarstvo poljoprivrede, Zagreb.
2. Ravlić, M. (2017): Zbirka zadataka iz fitofarmacije. Sveučilište J. J. Strossmayera, Poljoprivredni fakultet u Osijeku.
3. F. Bagi, K., Bodnar (2012): Fitomedicina, Univerzitet u Novom Sadu, Poljoprivredni fakultet.

Additional literature

1. Glasilo biljne zaštite: Popis sredstava za zaštitu bilja u Republici Hrvatskoj;
2. Znanstveni i stručni radovi iz relevantnih časopisa i baza.

PRACTICAL WORK I		
Coordinator	Andrijana Rebekić	
Collaborators		
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS points	6
	Number of hours (L+E+S)	E - 75
COURSE DESCRIPTION		
Course aims	Introducing students to the practical aspects of cultivation and production of the most important agricultural crops.	
Course enrolment requirements	No enrolment requirements	
Intended course learning outcomes		
After successfully completing the course, the student will be able to: 1. Determine agricultural crops in different developmental stages 2. Identify negative factors in crop production and recommend measures for improvement 3. Estimate the potential yield 4. Establish the effectiveness of the implemented agrotechnical procedures 5. Explain the importance of certain agrotechnical operations in the production process of the most important agricultural crops		
Assessment and evaluation of student work during classes		
Obligatory literature		
Additional literature		