Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

CURRICULUM

Agriculture (University Undergraduate Study Programme)

Major in **HORTICULTURE**

Academic year 2022 - 23

June, 2022

List of Teachers and Courses

Academic year 2022 - 23

Agriculture (University Undergraduate Study Programme

Major in **HORTICULTURE**

A full-time Study Programme

Agriculture (University Undergraduate Study Programme), major in HORTICULTURE

Academic year 2022 - 23

A List of Teachers and Courses

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
Maja Novoselec	English Language I	Maja Novoselec	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	
Tihana Sudarić	Basics of Agricultural Economics	Krunoslav Zmaić	30					6
		Tihana Sudarić	30					
		David Kranjac		15				
Krešimir Ižaković	Physical education and sports	Krešimir Ižaković			30			1

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Academic year 2022 - 23

A List of Teachers and Courses

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
Maja Novoselec	English Language II	Maja Novoselec	30			45		5
Irena Jug	Basics of Soil Science and Crop production	Irena Jug Vesna Vukadinović Bojana Brozović Danijel Jug	30 15 15 15					6
Danijel Jug	Agro-climatology and Basics of Physics	Danijel Jug Bojan Stipešević Bojana Brozović	30 20 5	 10		 10		6
Đuro Banaj	Mechanization in horticulture	Đuro Banaj Anamarija Banaj	60		 15			6
Monika Marković	Agricultural meliorations	Monika Marković	45		5	25		6
Krešimir Ižaković	Physical education and sports	Krešimir Ižaković			30			1

Agriculture (University Undergraduate Study Programme), major in HORTICULTURE

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A List of Teachers and Courses

III. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Sonja Petrović	Genetics	Sonja Petrović Drago Bešlo	42 3			30		6
Vesna Vukadinović	Soil science and soil microbiology	Vesna Vukadinović Gabriella Kanižai-Šarić Vladimir Zebec	30 25				10 10	6
Zdenko Lončarić	Fertilization in horticulture	Zdenko Lončarić Brigita Popović	20 20					3
Zdenko Lončarić	Eco-Physiology and Plant Nutrition	Zdenko Lončarić Tihana Teklić Miroslav Lisjak Brigita Popović Boris Đurđević	15 15 15 10 10				5 5	6
Ankica Sarajlić	Entomology I	Ankica Sarajlić Mirjana Brmež Josipa Puškarić	40 5				30	6
Krešimir Ižaković	Physical education and sports	Krešimir Ižaković			30			1

Agriculture (University Undergraduate Study Programme), major in HORTICULTURE

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A List of Teachers and Courses

IV. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Vlado Guberac	Plant Breeding and Seed Production	Vlado Guberac Sonja Vila Sunčica Kujundžić	35 10 30					6
Tomislav Vinković	Vegetable production	Tomislav Vinković Boris Ravnjak	40	5	10	20		6
Edita Štefanić	Plant Systematics	Edita Štefanić Sanda Rašić	45		6		24	5
Aleksandar Stanisavljević	Fruit growing	Aleksandar Stanisavljević Dejan Bošnjak	70		5			6
Jasenka Ćosić	Phytopathology I	Jasenka Ćosić Karolina Vrandečić Đuro Banaj	35 15 5	10			10	5
Renata Baličević	Principles of Phytomedicine in Horticulture	Renata Baličević Marija Ravlić	20			15		3
Krešimir Ižaković	Physical education and sports	Krešimir Ižaković			30			1

Agriculture (University Undergraduate Study Programme), major in HORTICULTURE

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A List of Teachers and Courses

V. semester

COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARES	EXERCISES			
					FE	AE	LE	
Vladimir Jukić	Viticulture	Vladimir Jukić Mato Drenjančević Toni Kujundžić	55 15		 5			5
Monika Tkalec Kojić	Floriculture	Monika Tkalec Kojić	35	10	10	20		5
Darko Kiš	Processing and Storage in Horticulture	Darko Kiš	35			5		3
Alka Turalija	Landscape shaping and dendrology	Alka Turalija	55			20		6
Ružica Lončarić	Marketing Management in Horticulture	Lončarić Ružica Sanja Jelić Milković	50	15 10				5
	FINAL THESIS							6

Agriculture (University Undergraduate Study Programme), major in HORTICULTURE

Academic year 2022 - 23

A List of Teachers and Courses

VI. semester

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

Agriculture (University Undergraduate Study Programme)

Major in **HORTICULTURE**

Academic Year 2022 - 23

ENGLISH LANGUAGE I		
Coordinator	Maja Novoselec	
Collaborators	-	
Study year and semester	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (L+E)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	- Identify and explain key words and sentences in professional and scientific texts. - Train students to independently use professional literature in their area of specialization at all levels (promotional texts, work instructions, online texts, professional books, and manuals), as well as to communicate, understand, and present content related to agriculture. - Develop the ability to translate professional texts from English to Croatian and vice versa.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Recognize the English language of the profession (agriculture) and describe the difference between technical and general language in texts.
2. Identify key words and use them to write a summary in your own words.
3. Predict the further content of the text based on the identified keywords.
4. In selected professional texts, recognize previously illustrated grammar structures and apply them by independently creating and writing a text in your area of interest (crop production, horticulture, animal husbandry, and mechanization).
5. Independently present, comment on, and explain a previously planned topic, and assess whether other students have correctly understood what was presented.
6. Compare and critically evaluate the presented topics with reasoned arguments.

Assessment and evaluation of student work during classes

In the final grade evaluation for students, continuous monitoring of class participation (class activity, preparation for class, and reflective review of course content) is considered, as well as continuous knowledge assessment (partial exams: 2 written and 1 oral), and the final written and oral exams. Taking partial exams is not mandatory.

Class attendance is mandatory in accordance with the Regulations on Studies and Studying at the Josip Juraj Strossmayer University of Osijek. If a student is absent for more than 30% of class hours (more than 4 times), they lose the right to receive a course signature.

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, et al. *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. edition, e-book, Cambridge UP, 2019.
5. Ritz, Josip. *Hrvatsko-engleski i englesko-hrvatski agronomski rječnik*. Školska knjiga, 1996.

GERMAN LANGUAGE I		
Coordinator	Tihomir Živić	
Collaborators	–	
Course status	Obligatory	
Study year and semester	First year, I. 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 proper use of (Grammatical and Vocabulary) structures in the German language for the field of agrobiotechnical sciences and expertise.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Lead an oral discussion based on a read text or a listened-to conversation in a foreign language.
2. Produce a written summary with a specific word count.
3. Interpret a text.
4. Apply acquired vocabulary and constructions in a new context.
5. Use IT knowledge to gather information in a foreign language on a specific topic.
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

Eligibility for the Final Oral Exam is achieved by accumulating a minimum number of assessment points. These points are earned by attending at least 70% of classes (lectures and auditory exercises), participating actively in class, and achieving grades in partial written exams. During the semester, students take two partial written 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 an overall passing grade in the course.

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.

CHEMISTRY		
Coordinator	Vesna Rastija	
Collaborators	Maja Karnaš Domagoj Šubarić	
Study year and semester	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	Familiarizing students with the basics of general, inorganic, and organic chemistry, chemical calculations, and practical work in the chemistry laboratory.	
Course enrolment requirements	No prerequisites.	

Intended course learning outcomes

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

1. Distinguish between types of substances.
2. Relate the electron structure of an atom to the chemical and physical properties of the element.
3. Illustrate the formation and geometry of chemical bonds.
4. Explain chemical equilibrium and energy changes in chemical reactions.
5. Present fundamental electron and proton transfer reactions.
6. Assess the acid-base properties of chemical compounds.
7. Describe the structure, reactivity, and properties of basic inorganic chemical compounds important in agronomy.
8. Differentiate between the structures, properties, and reactivity of fundamental types of organic compounds.
9. Solve basic stochiometric problems.
10. Apply principles of safe laboratory practice in performing basic techniques of qualitative and quantitative chemical analysis.

Assessment and evaluation of student work during classes

Eligibility for the Final Exam is achieved by accumulating a minimum number of assessment points. These points are earned based on class attendance (at least 70%), class participation, and grades from partial exams. During the semester, students take five partial exams (two from exercises in the 6th and 13th weeks, and three from 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 overall course 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	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	To introduce students to fundamental knowledge of functions, as well as methods of differential and integral calculus. Lectures will cover basic concepts and illustrate their applications. In exercises, students are expected to master the relevant techniques and develop the skills necessary to solve specific problems.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

Eligibility for the Final Exam is achieved by accumulating a minimum number of assessment points. These points are earned based on class attendance (at least 70%), class participation, submission of homework on Merlin (the e-learning system), and partial exams. During the semester, students 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 an overall passing grade in the course.

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 et al., Matematika za tehnološke fakultete, Zagreb, 1994.
3. S. Kurepa, Matematička analiza 1 i 2, Tehnička knjiga, Zagreb, 1972.
4. V. Devide et al., Riješeni zadaci iz više matematike, Školska knjiga, Zagreb, 1979.

GENERAL BOTANY AND ZOOLOGY		
Coordinator	Edita Štefanić	
Collaborators	Tihomir Florijančić Siniša Ozimec Ivica Bošković Sanda Rašić	
Study year and semester	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E)	75 (45L+30E)
COURSE DESCRIPTION		
Course aims	Introduce the student to fundamental knowledge of cell structure and the function of plant tissues and organs (both vegetative and generative). Familiarize and train the student to independently interpret the structural and functional characteristics of members of the animal kingdom, with emphasis on the anatomy, function, and ecology of animal organisms.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Describe the chemical basis of plant cells, including biogenic elements and chemical compounds in plant cells.
2. Investigate, identify, and describe the structure of plant cells.
3. Explain and analyse the cell cycle, including mitosis and meiosis.
4. Differentiate and analyse plant tissues and organs.
5. Explain plant reproduction and dispersal.
6. List the characteristics and organization of animal organisms.
7. Use scientific nomenclature in zoological classification.
8. Relate evolutionary processes and phylogenetic relationships among groups within the animal kingdom.
9. Distinguish structural and functional specificities among groups in 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 achieved by accumulating the minimum required number of assessment points. Assessment points are earned based on class attendance (at least 70 %), participation in class, and grades from partial exams. During the semester, students take two partial exams (in the 9th and 15th week 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 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

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	Tihana Sudarić	
Collaborators	Krunoslav Zmaić David Kranjac	
Study year and semester	First year, I. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+S)	75 (60L+15S)
COURSE DESCRIPTION		
Course aims	Familiarize students with the influence 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 prerequisites	

Intended course learning outcomes

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

1. Explain the significance and functions of agriculture in economic development.
2. Interpret the specifics of agriculture and the principles governing production, distribution, exchange, and consumption.
3. Compare total, average, and marginal relationships of the production function.
4. Relate production isoquants and isocost curves with the marginal rate of technical substitution, perfect substitutes, and complementary factors.
5. Calculate economic performance indicators.
6. Propose and compare selected thematic units from various areas of agricultural economics.

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, completion of tasks during lectures and seminars, seminar evaluation, and grades from partial exams. During the semester, students are required to complete an independent seminar paper, which is mandatory. Students will present their seminar paper orally in a 10 to 15-minute PowerPoint presentation. The presentation schedule will be arranged in advance. Additionally, 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 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	Krešimir Ižaković	
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		

GERMAN LANGUAGE II		
Coordinator	Tihomir Živić	
Collaborators	–	
Study year and semester	First year, II. semester	
Bodovna vrijednost i način izvođenja nastave	ECTS credits	5
	Number of hours (L + E)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	Development of listening, speaking, reading, and writing skills, as well as proper use of (Grammatical and Vocabulary) structures in the German language for the field of agrobiotechnical sciences and expertise	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Lead an oral discussion based on a read text or a listened-to conversation in a foreign language.
2. Produce a written summary with a specific word count.
3. Interpret a text.
4. Apply acquired vocabulary and constructions in a new context.
5. Use IT knowledge to gather information in a foreign language on a specific topic.
6. Analyse 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

Eligibility for the Final Oral Exam is achieved b y accumulating a minimum number of assessment points. These points are earned by attending at least 70% of classes (lectures and auditory exercises), participating actively in class, and achieving grades in partial written exams. During the semester, students take two partial written 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 an overall passing grade in the course.

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 and 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 II		
Coordinator	Maja Novoselec	
Collaborators	-	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (L+E)	75 (30 L + 45 E)
COURSE DESCRIPTION		
Course aims	- Expand and enrich the professional vocabulary and grammatical structures acquired in the first semester to cover new areas of interest. - Independently compose summaries of presented topics. - Analyse, translate, discuss, and draw conclusions on content related to students' field of study, based on personal perspectives.	
Course enrolment requirements	No prerequisites.	

Intended course learning outcomes

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

1. Use skills (listening, comprehension, reading, and writing) acquired in the first semester to select, translate, and interpret relevant professional topics.
2. Identify and compare professional and scientific papers and translate them from English to Croatian and vice versa.
3. Restructure sentence constructions in summaries of professional and scientific papers.
4. Represent professional and scientific texts with diagrams and justify their use in English.
5. Select current, relevant topics in the field and critically assess them.
6. Conceptualize, propose, and independently write a paper on a selected topic.

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 continuous assessment and knowledge testing (two written and one oral partial exams), and a final written and oral exam. Attendance at partial exams is not mandatory.

Class attendance is mandatory in accordance with the Regulations on Studies and Studying at the J.J. Strossmayer University of Osijek. If a student is absent for more than 30% of the scheduled class hours (more than four times), they lose the right to obtain a course signature.

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, et al. *Basic Grammar in Use Student's Book with Answers and Interactive eBook: Self-study Reference and Practice for Students of American English*. 4th edition, 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, et al. *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.

BASICS OF SOIL SCIENCE AND CROP PRODUCTION		
Coordinator	Irena Jug	
Collaborators	Danijel Jug Vesna Vukadinović 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)	75 (75L)
COURSE DESCRIPTION		
Course aims	Introduce the student to the fundamentals of soil science and the principles of plant production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Explain the roles of soil and the impact of its physical, chemical, and biological properties on its productive capacity and fertility.
2. Describe and differentiate the properties of dominant soil types.
3. Describe the role and importance of elements in plant nutrition.
4. Explain fertilization and the classification of fertilizers based on origin, composition, application timing, type of nutrient, physical state, and mode of action.
5. Describe soil conditioners and substrates used in plant production.
6. Plan the sequence of agronomic practices in plant production.
7. Explain and apply the basic principles (tillage, fertilization, humus management, and crop residue management) to implement good agricultural practices.
8. Explain the importance of biological reproduction, crop care, crop rotation, monoculture, and intercropping, and differentiate conventional agricultural production from alternative methods.

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%), class participation, and grades from partial exams. During the semester, students take four partial exams (in the 5th, 9th, 12th, 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. Jug I., Jug D., Brozović B., Vukadinović V., Đurđević B. (2022): Osnove tloznanstva i biljne proizvodnje. Sveučilišni udžbenik. Sveučilište Josipa Jurja Strossmayera u Osijeku, Fakultet agrobiotehničkih znanosti Osijek (FAZOS), Osijek, Hrvatska, str. 527. ISBN: 978-953-8421-00-6.
2. 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.
3. Vukadinović, V., Vukadinović, V. (2011): Ishrana bilja. Poljoprivredni fakultet Osijek

Additional literature

1. Jug D., Jug I., Vukadinović V., Đurđević B., Stipešević B., Brozović B. (2017): Konzervacijska obrada tla kao mjera ublažavanja klimatskih promjena. Sveučilišni priručnik. Hrvatsko društvo za proučavanje obrade tala (HDPOT), Osijek, Hrvatska, str. 176. ISBN: 978-953-7871-61-1.
2. Bašić, F., Herceg, N. (2010): Temelji uzgoja bilja. Synopsis, Zagreb.

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.		

MECHANIZATION IN HORTICULTURE		
Coordinator	Đuro Banaj	
Collaborators	Anamarija Banaj	
Study year and semester	First year, II. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E)	L-60, E-15
COURSE DESCRIPTION		
Course aims	Familiarize students with new advancements in the development of technical systems in crop production and their potential application in new farming technologies.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. List the primary tasks of technical systems in primary and supplementary soil cultivation.
2. Describe the factors influencing the selection of machinery and their potential for aggregation.
3. Identify the basic systems and methods for their adjustment.
4. Differentiate technical systems, types, and additional equipment.
5. Select technical systems according to the requirements of the applied cultivation technology.

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, 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 passing 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, Osijek.
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, Osijek.

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	Teach students what agricultural amelioration is, what it involves in the arrangement of agricultural land and production areas, and what the basic agrotechnical and hydrotechnical measures applied in practice are.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Calculate and convert measurement units and tasks applied in agriculture.
2. Explain the issues of unregulated water-air regimes in agricultural soils.
3. List the consequences of excess water and lack of water in agriculture.
4. Explain the functionality of drainage and irrigation.
5. List and define methods of drainage and irrigation.
6. Select and propose methods of drainage and irrigation.
7. Determine the elements of irrigation.

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, 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. 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. Ondrašek 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	Krešimir Ižaković	
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		

GENETICS		
Coordinator	Sonja Petrović	
Collaborators	Drago Bešlo	
6Study 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- 45, E - 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		

SOIL SCIENCE AND SOIL MICROBIOLOGY		
Coordinator	Vesna Vukadinović	
Collaborators	Gabriella Kanižai-Šarić Vladimir Zebec	
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 (55L + 20E)
COURSE DESCRIPTION		
Course aims	Students are introduced to the significance of soil and its properties, primarily from genetic-pedological and agroecological aspects, as well as the principles and methods for determining certain parameters important for soil fertility. Basic knowledge of soil microbiology provides students with insight into the unique perspective of nutrient cycling and the fundamental processes that are under the direct influence of soil microorganisms.	
Course enrolment requirements	No prerequisites.	

Intended course learning outcomes

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

1. Describe the factors of soil formation and evolution.
2. Describe the physical and chemical properties of soils.
3. Analyse and apply the results of soil physical and chemical analyses.
4. Recognize the limitations of agricultural soils in horticultural production.
5. Select and propose measures to improve the biological, physical, and chemical properties of soils.
6. Explain the differences in structure and function between prokaryotic and eukaryotic cells.
7. Describe microbiological processes in the cycling of the most significant biogenic elements.
8. Explain the importance of plant interactions with beneficial microorganisms.

Assessment and evaluation of student work during classes

Students gain the right to take the final exam by accumulating the minimum required number of assessment points during the semester. Assessment points are collected based on class attendance (minimum of 70%), participation in class, and grades from partial exams. During the semester, students take two partial exams (in the 9th week after completing the pedology thematic unit and in the 16th week after completing the microbiology unit). The final exam is mandatory and consists of both oral and written components. A passing grade on the final exam is a prerequisite for a final passing grade.

Obligatory literature

1. Husnjak, S. (2022): Osnove pedologije. Sveučilište u Zagrebu Agronomski fakultet. Zagreb.
2. Jug, I., Jug, D., Brozović, B., Vukadinović, V., Đurđević, B. (2022): Osnove tloznanstva i biljne proizvodnje. Fakultet agrobiotehničkih znanosti Osijek. Sveučilište J. J. Strossmayera u Osijeku, Osijek.
3. Špoljar, A. (2015): Pedologija. Visoko gospodarsko učilište u Križevcima. Križevci.
4. Škorić, A. (1991): Sastav i svojstva tla. Fakultet Poljoprivrednih znanosti. Zagreb.
5. Vukadinović, V., Vukadinović, V. (2011): Ishrana bilja. Poljoprivredni fakultet u Osijeku. Osijek.
6. Pernar, N. Bakšić, D., Perković, I. (2013.): Terenska i laboratorijska istraživanja tla - priručnik za uzorkovanje i analizu. Šumarski fakultet Sveučilišta u Zagrebu, Hrvatske šume d.o.o.
7. Duraković, S., Redžepović, S. (2002): Uvod u opću mikrobiologiju. Kugler, Zagreb.
8. Duraković, S. (1996): Opća mikrobiologija. Durieux. Zagreb.
9. Kanižai-Šarić, G. (2015): Praktikum iz opće mikrobiologije – interno izdanje. Poljoprivredni fakultet u Osijeku, Sveučilište J. J. Strossamyera u Osijeku.
10. Duraković, S., Duraković, L. (1998): Priručnik za rad u mikrobiološkom laboratoriju, I. dio - knjiga prva. Durieux. Zagreb.

Additional literature

1. Pernar, N. (2017): Tlo; nastanak, značajke, gospodarenje. Šumarski fakultet Sveučilišta u Zagrebu. Zagreb.

2. Resulović, H., Čustović, H. (2002): Pedologija - opći dio. Univerzitet u Sarajevu, Poljoprivredni fakultet. Sarajevo.
3. Dugalić, G.J., Gajić, B.A. (2005): Pedologija - praktikum. Agronomski fakultet Čačak. Čačak.
4. Đukić, D.A., Jemcev, V.T., Kuzmanova, J. (2007): Biotehnologija zemljišta. Univerzitet u Kragujevcu, Agronomski fakultet u Čačku. Čačak.
5. Kastori, R.(ur.) (2005): Azot, agrohemijski, agrotehnički, fiziološki i ekološki aspekti. Naučni institut za ratarstvo i povrtarstvo, Novi Sad. Novi Sad.
6. Subbarao, N.S. (1999): Soil Microbiology. Science Pub.Inc.

FERTILIZATION IN HORTICULTURE		
Coordinator	Zdenko Lončarić	
Collaborators	Brigita Popović	
Study year and semester	Second year, III. semester	
Number of credits and mode of delivery	ECTS credits	3
	Number of hours (L+E+S)	L- 40, E - 0, S – 0
COURSE DESCRIPTION		
Course aims	Introduce students to the reasons, objectives, and principles of fertilization in horticulture; the fundamentals of production, types, quality, and properties of mineral and organic fertilizers and conditioners; and the specific aspects of fertilization in horticulture. By mastering the proposed program, students will understand the need for fertilization and the selection of optimal fertilizers, the ecological and economic significance of fertilization; they will comprehend the principles of calculating necessary fertilization and soil conditioning for growing vegetables, flowers, medicinal plants, and perennial woody crops; and become familiar with the basic computer programs for fertilization in horticulture that are used in the Republic of Croatia.	
Course enrolment requirements	Chemistry	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Explain the reasons, tasks, principles, and systems of fertilization from historical, ecological, technological, and economic perspectives. 2. Differentiate types of fertilizers and conditioners according to all classification criteria. 3. Describe the chemical properties, nutrient forms, production, and technological properties of the most significant mineral fertilizers. 4. Describe the physical, chemical, and biological properties of organic fertilizers and substrates for horticultural production. 5. Apply the principles of calculating the optimal quantity and dynamics of nutrient requirements for vegetables, flowers, and woody crops, as well as soil conditioning. 6. Explain the results of basic soil analyses needed for calculating fertilization.		
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, and grades from partial exams. During the semester, students take two partial exams (for example 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.		
Obligatory literature		
1. Lončarić, Z., Parađiković, N., Popović, B., Lončarić, R., Kanisek, J. (2015.): Gnojidba povrća, organska gnojiva i kompostiranje. Urednik: Lončarić, Z. Sveučilišni priručnik. Poljoprivredni fakultet Sveučilišta u Osijeku. 123 str. 2. Lončarić, Z., Karalić, K. (2015.): Mineralna gnojiva i gnojidba ratarskih usjeva. Urednik: Lončarić, Z. Sveučilišni priručnik. Poljoprivredni fakultet Sveučilišta u Osijeku. 120 str. 3. Lončarić, Z., Rastija, D., Karalić, K., Popović, B., Ivezić, V., Lončarić, R. (2015.): Kalcizacija tala u pograničnome području. Urednik: Lončarić, Z. Sveučilišni priručnik. Poljoprivredni fakultet Sveučilišta u Osijeku. 75 str.		
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. Sveučilišni priručnik. Poljoprivredni fakultet Sveučilišta u Osijeku. 56 str.		

3. Lončarić, Z., Rastija, D., Baličević, R., Karalić, K., Popović, B., Ivezić, V. (2014.): Plodnost i opterećenost tala u pograničnom području. Urednik: Lončarić, Z. Sveučilišni priručnik. Poljoprivredni fakultet Sveučilišta u Osijeku. 72 str.
4. Parađiković, N (2009.): Opće i specijalno povrćarstvo. Poljoprivredni fakultet Sveučilišta Josipa Jurja Strossmayera u Osijeku.
5. Fink, A. (1982.): Fertilizers and fertilization. Introduction and Practical Guide to Crop Fertilization. Verlag Chemie. Weinheim, Florida, Basel.

ECO-PHYSIOLOGY AND PLANT NUTRITION		
Coordinator	Zdenko Lončarić	
Collaborators	Tihana Teklić Miroslav Lisjak Brigita Popović Boris Đurđević	
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- 65, E - 10, S – 0)
COURSE DESCRIPTION		
Course aims	Familiarization with the transformation of matter and energy in plants and the influence of environmental factors on plant growth and development, from the cellular level to the level of biosystems; understanding the physical, chemical, and physiological processes in the soil and plant that, through the interaction between the plant and substrate, affect the uptake, movement, and distribution of nutrients. Ecophysiology and plant nutrition provide knowledge about primary organic production in the soil-plant-atmosphere system, with an emphasis on the quantity and quality of yield.	
Course enrolment requirements	Chemistry, Basics of Soil Science and Crop Production	

Intended course learning outcomes

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

1. Explain the physiological processes of matter and energy transformation, primary metabolism of carbohydrates, proteins, and lipids.
2. Interpret the functions of physiologically active substances and the processes of plant growth and development.
3. Interpret the influence of biotic and abiotic factors (soil, temperature, water, light, nutrients) on the basic physiological processes of plants.
4. Understand the physiological foundations of plant stress resistance.
5. Know the classification of chemical elements in terms of their significance for plant nutrition.
6. Explain soil fertility, as well as the status and dynamics of nutrients in the soil.
7. Interpret the impact of soil fertility and nutrient content in plants on plant productivity, the laws of growth, and yield formation.
8. Organize and conduct basic chemical soil analyses, and interpret the analysis results.
9. Explain the process of nutrient uptake.
10. Explain the chemical properties and forms in the soil, and interpret the physiological role in plants of primary and secondary macroelements, microelements, beneficial elements, and toxic elements.

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, and grades from partial exams. During the semester, students take two partial exams (for example 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.

Obligatory literature

1. Teklić, T. (2012): Fiziologija bilja u povrćarstvu i cvjećarstvu (interna skripta), Poljoprivredni fakultet u Osijeku.
2. Vukadinović, V. (1997): Ekofiziologija. Skripta, Poljoprivredni fakultet u Osijeku
3. Vukadinović V. i Lončarić Z. (1997): Ishrana bilja, Sveučilište u Osijeku, Poljoprivredni fakultet u Osijeku.
4. Lončarić, Z. (2005): Program vježbi iz kolegija "Ishrana bilja". Praktikum za studente. Interna skripta. Poljoprivredni fakultet Sveučilišta u Osijeku. Osijek.
5. Lončarić, Z. (2017): Kretanje i usvajanje hraniva. Fakultet agrobiotehničkih znanosti Osijek.

Additional literature

1. Pevlek-Kozlina, B. (2003): Fiziologija bilja. Profil International, Zagreb.
2. Reiss, C. (1994): Experiments in plant physiology. Prentice Hall.
3. Vukadinović, V. i Vukadinović V. (2012): Ishrana bilja. Sveučilište u Osijeku, Poljoprivredni fakultet u Osijeku.
4. Vukadinović V. i Bertić B. (1988): Praktikum iz agrokemije i ishrane bilja. Poljoprivredni fakultet u Osijeku, skripta

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

Intended course learning outcomes

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

1. Describe the role of insects in agriculture, list the biological characteristics of insects, and ecological factors important for their development.
2. Relate the structure of insects to the symptoms of plant damage.
3. Recommend zoocides for controlling harmful organisms.
4. Recommend the most suitable 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 methods of collecting insects, as well as their preparation and storage.

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 (minimum 70%), participation in class, and grades from partial exams. In the second part of the semester, students are required to collect 20 insects, with a maximum of 3 from the same order, and submit a form indicating the orders to which the insects belong along with the insects. Collecting insects is mandatory for the final grade in the Entomology I module. During the semester, five partial exams will be conducted—two from exercises and three partial exams from the lecture part. At the beginning of the semester, students will be informed about the dates of the partial written exams. The final exam is mandatory and can be oral or written.

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, Poljoprivredni fakultet 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 collecting

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.)

In addition to the provided literature, students will be continuously directed to the latest scientific papers, books, and manuals in the field of entomology as additional clarification of specific thematic units.

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Krešimir Ižaković	
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 BREEDING AND SEED PRODUCTION		
Coordinator	Vlado Guberac	
Collaborators	Sonja Vila, Sunčica Kujundžić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (L- 75, E - 0, S - 0)
COURSE DESCRIPTION		
Course aims	Introduce undergraduate students to the basics of plant breeding and the fundamentals of seed and planting material production.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Explain the importance of plant breeding and seed production for agricultural production and ensuring sufficient food supplies. 2. Describe the basic steps and characteristics of the breeding process. 3. Select breeding methods appropriate for the plant species. 4. Describe biotechnological methods applied in plant breeding. 5. Describe the morphological, physiological, and anatomical characteristics of seeds. 6. Differentiate the basic categories of seeds, types of cultivars, and certification methodologies.		
Assessment and evaluation of student work during classes		
In determining the final grade for students, continuous class monitoring is taken into account (class participation, preparation for class, reflective analysis of course content) and a written exam. Attendance is mandatory in accordance with the Regulations on Studies and Studying at the Josip Juraj Strossmayer University of Osijek.		
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 Osijeku		
Additional literature		
1. Kolak, I. (1994): Sjemenarstvo ratarskih i krmnih kultura. Udžbenik. 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. Udžbenik. Sveučilište u Osijeku, Osijek.		

VEGETABLE PRODUCTION		
Coordinator	Tomislav Vinković	
Collaborators	Boris Ravnjak	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (40L + 30E + 5S)
COURSE DESCRIPTION		
Course aims	Introduce students to vegetable crop species. Present traditional and modern production methods, and familiarize students with the basic principles of vegetable crop production.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. List and describe vegetable species
2. Recognize traditional and modern production methods
3. Apply basic rules and principles in fertilization, protection, harvesting, and transportation of vegetable species
4. Select and differentiate specific practices and care measures in the production processes of specific vegetable crops
5. Identify microclimatic conditions that can cause diseases and pests appearance during production and determine protection measures - biological control
6. Predict yields and ensure good fruit quality

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 (minimum 70%), participation in class, 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 final grade. The final exam is oral.

Obligatory literature

1. Parađiković, N. (2009.): Opće i specijalno povrćarstvo, Poljoprivredni fakultet Osijek.
2. Parađiković, N. (2014): Opće i specijalno povrćarstvo – online skripta, Poljoprivredni fakultet u Osijeku
3. 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

Scientific and professional papers from relevant journals and databases related to vegetable crop production.

PLANT SYSTEMATICS		
Coordinator	Edita Štefanić	
Collaborators	Sanda Rašić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (L + P)	75 (45L + 30E)
COURSE DESCRIPTION		
Course aims	Introduce students to the vast diversity of the plant world and the basic characteristics of individual systematic groups, especially those significant to the field of agronomy.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Describe and explain the concept of "biological diversity" and evolution. 2. Interpret the systematic classification of the plant world. 3. Distinguish and compare the most important plant families and species relevant to the field of agronomy. 4. Prepare a herbarium and identify and classify collected plants.		
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 (minimum 70%), class active participation, and grades from partial knowledge assessments. During the semester, students take three partial exams and independently collect plants for a herbarium. The final exam is mandatory, and a passing grade on the final exam is a prerequisite for taking the oral exam as well as herbarium.		
Obligatory literature		
1. Nikolić, T. (2013): Sistematska botanika. Alfa, Zagreb 2. 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		

FRUIT GROWING		
Coordinator	Aleksandar Stanisavljević	
Collaborators	Dejan Bošnjak	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (L+E+S)	75 (70L + 5E)
COURSE DESCRIPTION		
Course aims	Introduce students to the methodological units of biology and the technology of fruit crop cultivation, as well as aspects of fruit storage and processing.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Name different fruit groups and species according to the current classification within plant taxonomy.
2. Define the agroecological factors that determine the cultivation potential of individual fruit species.
3. Describe and identify the specific role of the morphological parts of different fruit species.
4. Recognize the phenological stages of development, growth, and fruiting of various fruit crops and their varieties.
5. Describe methods of fruit species propagation and apply techniques for reproducing fruit material.
6. Calculate and apply the required amounts of nutrients within the vegetative cycle of specific species.
7. Define and practically determine soil maintenance systems in an orchard.
8. Describe and apply pomotechnical practices.
9. Recognize the physiological and technological ripeness of fruits.
10. Define the technology of fruit storage.

Assessment and evaluation of student work during classes

Students are expected to attend classes continuously and actively participate in tasks during lectures. In the second part of the module, field classes and exercises will be organized in the orchard. Attendance at field classes is mandatory. After the lectures and exercises, students will take a written exam. In case of a negative outcome on the written exam, students have the option of taking a final oral exam. Students are encouraged to take notes during lectures and to prepare for exams using the required literature. In determining the final grade for students, continuous class participation is considered (class activity, preparation for class, reflective analysis of course content), along with a seminar paper and the written (or oral) exam. The seminar paper grade includes clarity, accuracy, and relevance of the information provided, as well as the overall (technical and visual) quality of the presentation. Attendance is mandatory in accordance with the Regulations on Studies and Studying at the Josip Juraj Strossmayer University of Osijek. If a student miss more than 30% of class hours, they lose the right to attend final exam.

Obligatory literature

1. Jemrić, Tomislav (2007): Cijepljenje i rezidba voćaka, Naklada Uliks, Rijeka
2. Krpina, Ivo (2004): Voćarstvo, Nakladni zavod Globus, Zagreb
3. Brzica, K., Pongrac, Lj., (1993): Priprema i sadnja voćnjaka, Biblioteka selo i hrana, Zagreb
4. Brzica, K. (1992): Uzgoj i rezidba voćaka, Biblioteka selo i hrana, Zagreb
5. Gvozdenović, D., Davidović, M. (1987): Berbe, čuvanje i pakovanje voća, Nolit, Beograd
6. https://fruit.cornell.edu/
7. https://www.canr.msu.edu/fruit/

Additional literature

1. Westwood, M. N. (1993): Temperature-zone pomology: physiology and culture, Timber Press, Inc., USA
2. Jackson, J. E. (2003): Biology of apples and pears, Cambridge University Press, UK
3. Faust, M. (1989): Physiology of temperate zone fruit trees, John Wiley & Sons, Inc, USA
4. Baugher, T., Singha, S. (2003): Concise Encyclopaedia of Temperate Tree Fruit, Haworth Press
5. Bulatović, S. (1979): Savremeno voćarstvo, Nolit, Beograd

6. Biškup, S., Gašpar, I. (2000): Gnojidba voćnjaka i vinograda, Pertokemija, d.d. Proizvodnja gnojiva, Kutina
7. Miljković, Ivo (1991): Suvremeno voćarstvo, Znanje, Zagreb (knjiga)
8. https://www.fao.org/home/en
9. https://www.freshplaza.com/europe/

PHYTOPATHOLOGY I		
Coordinator	Jasenka Ćosić	
Collaborators	Karolina Vrandečić Đuro Banaj	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (L+E+S)	75 (55L + 10E+ 10S)
COURSE DESCRIPTION		
Course aims	Introduce students to the basic concepts and fundamental principles of general phytopathology and fungal taxonomy, with examples of the most important disease-causing agents and technical systems in plant protection.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. List and describe the tasks of phytopathology and the damage caused by plant diseases. 2. Recognize symptoms in diseased plants. 3. Explain the impact of environmental factors on disease-causing agents. 4. Describe the defence responses in diseased plants. 5. Describe the basic taxonomic units of fungi. 6. Identify and describe the most significant disease-causing agents in vegetable farming, floriculture, fruit growing, and viticulture. 7. Group and propose protection measures.		
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 (minimum 70%), participation in class, and grades from seminars and 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 final grade. The final exam is oral.		
Obligatory literature		
1. Kišpatić, J. (1992): Opća fitopatologija. Agronomski fakultet Zagreb. 2. Maceljski, M., Cvjetković, B., Ostojić, Z., Igric Barčić, J., Pagliarini, N., Oštrec, LJ., Barić, K., Čizmić, I. (2004): Štetočinje povrća. Sveučilište u Zagrebu. Agronomski fakultet. 3. Jurković, D., Ćosić, J., Vrandečić, K. (2010): Bolesti cvijeća i ukrasnog bilja. Poljoprivredni fakultet u Osijeku. 4. Cvjetković, B. (2010): Mikoze i pseudomikoze voćaka i vinove loze. Zrinsko, Čakovec.		
Additional literature		
1. Agrios, G.N. (1997): Plant Pathology. General Aspects. Academic Press, New York. 2. Brmež, M., Ćosić, J., Raspudić, E., Baličević, R., Liška, A., Majić, I., Ilić, J., Sarajlić, A., Lucić, P., Ravlić, M., Puškarić, J. (2019): Okolišno prihvatljiva zaštita bilja. Fakultet agrobiotehničkih znanosti Osijek.		

PRINCIPLES OF PHYTOMEDICINE IN HORTICULTURE		
Coordinator	Renata Baličević	
Collaborators	Marija Ravlić	
Study year and semester	Second year, IV. semester	
Number of credits and mode of delivery	ECTS credits	3
	Number of hours (P+E+S)	35 (20 P + 15 E)
COURSE DESCRIPTION		
Course aims	Introduce students to the basics of phytomedicine and measures for protecting plants from harmful organisms.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Identify the objectives of proper application of plant protection products according to the current requirements of producers, processors, and consumers within the legal framework.
2. Differentiate harmful organisms and apply appropriate 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 a given topic in plant protection 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 (minimum 70%), participation in class, and grades from partial exams. During the semester, students take two 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 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. (odabrana poglavlja)

Additional literature

1. Glasilo biljne zaštite: Popis sredstava za zaštitu bilja u Republici Hrvatskoj;

Scientific and professional papers from relevant journals and databases.

PHYSICAL EDUCATION AND SPORTS		
Coordinator	Krešimir Ižaković	
Collaborators	-	
Study year and semester	Second year, IV. 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		

VITICULTURE		
Coordinator	Vladimir Jukić	
Collaborators	Mato Drenjančević Toni Kujundžić	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS	5
	Number of hours (L+E+S)	75 (70 L + 5 E)
COURSE DESCRIPTION		
Course aims	Describe the methodological units of the biology and technology of grapevine cultivation and the processing of grapes into wine.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. Describe the taxonomy, ecology, morphology, phenological stages of grapevine development, as well as the fruiting and reproduction of grapevine. 2. Compare different systems for supplying soil and plants with macro and micronutrients, and methods for improving the physical, chemical, and biological properties of soil. 3. Differentiate between various vineyard soil maintenance systems, vineyard trellising, training systems, and pruning practices for mature and green growth. 4. Argue protection options against diseases and pests. 5. Describe wine and table grape cultivars, harvest organization, and grape processing. 6. Define the legal framework in viticulture and winemaking.		
Assessment and evaluation of student work during classes		
In determining the final grade for students, continuous monitoring of class participation (including class activity, preparation for lessons, and reflective analysis of course content), continuous assessment and knowledge testing (partial exams), and the final oral exam are taken into account. Attendance is mandatory in accordance with the Regulations on Studies at the Josip Juraj Strossmayer University of Osijek.		
Obligatory literature		
1. Mirošević, N. (1996): Vinogradarstvo, Nakladni zavod Globus, Zagreb 2. Mirošević, N., Turković, Z. (2003): Ampelografski atlas, Golden marketing i tehnička knjiga Zagreb		
Additional literature		
1. Fregoni, M. (1986): Viticultura generale, Universita Cattolica – Piacenza; REDA, Roma 2. Burić, D. (1981): Vinogradarstvo I, Ćirpanov, Novi Sad 3. Vršič, S., Lešnik, M. (2005): Vinogradništvo, Maribor 4. Jackson, R.S. (2000): Wine science. Academic Press, London		

FLORICULTURE		
Coordinator	Monika Tkalec Kojić	
Collaborators		
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (L+E+S)	75 (35L + 30E+ 10S)
COURSE DESCRIPTION		
Course aims	Introduce students to floricultural species. Present traditional and modern production methods, and familiarize students with the basic principles of floricultural production.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. List and describe floricultural species. 2. Recognize traditional and modern production methods. 3. Apply basic rules and principles in fertilization, protection, harvesting, and transportation of floricultural species. 4. Select and differentiate specific practices and care measures in the production processes of particular crop. 5. Identify microclimatic conditions that can cause diseases and pests in flowers and determine protection measures—biological control. 6. Predict yields and ensure good flower quality.		
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 (minimum 70%), participation in class, 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 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. (2008): Jednogodišnje, dvogodišnje i višegodišnje cvjetne vrste i Uzgoj cvijeća u zaštićenom prostoru (predavanja – interna skripta)		
Additional literature		
1. Todorović, V., Zeljković, S., Moravčević, Đ. (2019): Proizvodnja rasada povrća i cvijeća, Poljoprivredni fakultet Univerziteta u Banjoj Luci Scientific and professional papers from relevant journals and databases related to floricultural crops production.		

PROCESSING AND STORAGE IN HORTICULTURE		
Coordinator	Darko Kiš	
Collaborators		
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS credits	3
	Number of hours (L+E+S)	40 (35 L + 5 E)
COURSE DESCRIPTION		
Course aims	Enable undergraduate students to master the material and acquire knowledge to achieve optimal processing and storage of horticultural products.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. List the basic tasks of storage. 2. Describe the factors that influence the viability of agricultural products. 3. Identify the physical properties of agricultural products. 4. Differentiate types of storage facilities and the equipment within them. 5. Distinguish the basic moisture properties of different materials. 6. Recognize the basic dryer types.		
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 (minimum 70%) and participation in class. 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. 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. Zvonko Katić (1997): Sušenje i sušare u poljoprivredi, Multigraf, Zagreb 2. Petz, B. (1985.): Osnovne statističke metode za nematematičare. SNL, 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

Student performance is regularly evaluated through all their activities. Attendance (5% of total assessment points) is monitored as well as participation in lectures (5%), participation in exercises (10%), seminars (10%), two partial written exams (2x30%) or a comprehensive written exam (60%).

Obligatory literature

1. Clifton, J. (2007). Novi dizajn vrta (kako kreirati suvremini životni prostor), LEO-COMERCE d.o.o., Rijeka
2. Idžojtić, M., (2010): Dendrologija-list, Dendrologija- izbojak, Dendrologija-cvijet, češer, plod, sjeme. Sveučilište u Zagrebu, Šumarski fakultet, Zagreb
3. Neufert, P., (2002): Elementi arhitektonskog projektiranja, Golden marketing, Zagreb
4. Ogrin, D., (1993). Vrtna umetnost sveta, Maribor, IZUM-Institut informacijskih znanosti. Maribor
5. Obad-Šćitaroci, M., (1992). Hrvatska parkovna baština – zaštita i obnova, Skolska knjiga d.d. Zagreb
6. Prinz, D., (2006): Urbanizam, Svezak I i II, Golden marketing-tehnička knjižara, Zagreb

Additional literature

1. Hrvatske ceste, (2007). Ceste i mostovi u Hrvatskoj, Hrvatsko društvo za ceste.VIA VITA, Zagreb
2. Rogin, J., (1998). Knjiga o ružama,AGM, Zagreb

MARKETING MANAGEMENT IN HORTICULTURE		
Coordinator	Ružica Lončarić	
Collaborators	Sanja Jelić Milković	
Study year and semester	Third year, V. semester	
Number of credits and mode of delivery	ECTS credits	5
	Number of hours (P+E+S)	75 (P 50+S 25)
COURSE DESCRIPTION		
Course aims	Provide students with the necessary knowledge about the management of marketing processes in horticulture.	
Course enrolment requirements	No prerequisites	

Intended course learning outcomes

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

1. Define the role of marketing within the system of sciences and marketing concepts.
2. Describe the market and the behaviour of consumers and competitors in the market for horticultural products.
3. Identify market segments and target markets for horticultural products.
4. Interpret marketing strategies for different stages of the lifecycle of agricultural products.
5. Create a marketing strategy based on the strength of the entity in the market.
6. Define strategies and programs for pricing, retail and wholesale systems, and the communication and promotional mix.

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, participation in class, tasks completed during lectures and seminars, seminar evaluation, and grades from partial exams. During the semester, students must complete an independent seminar paper, which is mandatory. Additionally, students take two partial exams during 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 can be written or oral.

Obligatory literature

1. Koester, U. (2020): Foundations of Agricultural Market Analysis and Agricultural Policy. Verlag Franz Vahlen GmbH; München.
2. Kotler, Ph. (1999): Marketing management, Informator, Zagreb.
3. Meler, M. (1999): Marketing, Ekonomski fakultet u Osijeku, Osijek.

Additional literature

1. Rocco, F. (1994): Marketinško upravljanje, Školska knjiga i CEMA, Zagreb.
2. McDonald M. (2004): Marketinški planovi: kako ih pripremiti, kako ih koristiti. Masmedia, Zagreb.

PRACTICAL WORK I		
Coordinator	Andrijana Rebekić	
Collaborators		
Study year and semester	Third year, VI. semester	
Number of credits and mode of delivery	ECTS credits	6
	Number of hours (P+E+S)	75 (E 75)
COURSE DESCRIPTION		
Course aims	Introduce students to the possibilities of selecting models and methods for the production of vegetables, flowers, grapevines, and fruits in greenhouses, tunnels, and open fields, as well as with the methods of modern processes within these types of plant production. Additionally, familiarize students with park and ornamental plant species and the basics of landscape design.	
Course enrolment requirements	No prerequisites	
Intended course learning outcomes		
After successfully completing the module, the student will be able to: 1. List and describe production technology methods for vegetable, floral, fruit, and ornamental species, as well as grapevines, and categorize them based on the model and method of production. 2. Recommend a production technology for a specific species according to agroecological and other environmental conditions. 3. Identify the advantages and disadvantages of a specific production technology. 4. Select and apply a specific production technology or technological process based on the main characteristics of the species, growing medium, and agroecological factors. 5. Identify diseases and pests of the mentioned species and implement control measures. Manage the production process of these species and apply modern technical management systems. 6. Predict yields and select appropriate markets for the products.		
Assessment and evaluation of student work during classes		
Obligatory literature		
Additional literature		