

Josip Juraj Strossmayer University of Osijek
FACULTY OF AGROBIOTECHNICAL SCIENCES OSIJEK

CURRICULUM

ZOO – TECHNIQUE

University Graduate Study Programme

Major in

FEEDING OF DOMESTIC ANIMALS

HUNTING AND BEEKEEPING

SPECIAL ZOO - TECHNIQUE

Academic Year 2022-23

June, 2022

List of Teachers and Courses

Academic year 2022 - 23

ZOO – TECHNIQUE

University Graduate Study Programme

Major in

FEEDING OF DOMESTIC ANIMALS

A full-time Study Programme

I. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
Marcela Šperanda	Biochemistry and Physiology of Animals	Marcela Šperanda	30					6
		Drago Bešlo	20					
		Dejan Agić					15	
		Mislav Đidara	5			5		
Suzana Kristek	Microbiology and forage	Suzana Kristek Jurica Jović	50				25	6
Zvonimir Steiner	Knowledge of feed materials	Zvonimir Steiner Mario Ronta	40 20				15	6
Matija Domaćinović	Technology of Feed Mixture Production	Matija Domaćinović Vlatka Rozman Ivana Prakatur	30 5 20		5		15	6
Ranko Gantner	Forage production	Gordana Bukvić Ranko Gantner Goran Herman	20 20		5	10	20	6
II. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
Zvonimir Steiner	Feeding of Ruminants	Zvonimir Steiner	30					6
		Zvonko Antunović	5					
		Mario Ronta	10			20		
		Josip Novoselec	5					
		Željka Klir Šalavardić				5		
Matija Domaćinović	Feeding of Non-ruminants	Matija Domaćinović	30					6
		Ivana Prakatur	10		5			
		Anđelko Opačak	10					
		Mario Ronta				20		

BIOCHEMISTRY AND PHYSIOLOGY OF ANIMALS		
Coordinator	Marcela Šperanda	
Collaborators	Mislav Đidara Drago Bešlo Dejan Agić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (55 L + 20 E)
COURSE DESCRIPTION		
Course aims	The objective is to introduce students to the integration of metabolism, DNA, and the genome, as well as the regulation of gene expression and information transfer. Students will learn about manipulating DNA and genes, the general principles of cellular signaling, G-proteins, the immune system, and the regulation of the cell cycle, apoptosis, and cancer. The module also covers metabolic processes in multicellular organisms, the metabolic profile of each organ, and the control of gene expression. Students will be familiarized with immune responses and hormonal regulation, as well as the microstructure of the digestive system, digestive physiology, and key biochemical processes in metabolism related to the liver, muscle tissue, kidneys, adipose tissue, food absorption regulation, and maintaining energy balance.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Understand the functioning of animal cells. 2. Interpret the functional anatomy of the digestive system. 3. Integrate the intermediary metabolism of nutrients with specific sections of digestive organs and cellular compartments. 4. Integrate the importance of fat-soluble vitamins and minerals from a nutritional, endocrine, and immune perspective. 5. Analyze the impact of nutrients and biologically active substances on muscle tissue growth, organism development, and milk production. 6. Summarize the mechanisms of non-specific and specific immune responses, understand the role of mucosal immunity in the context of overall defense against infection, and the development of oral tolerance. 7. Interpret the endocrine regulation of food intake and the distribution of nutrients across organs and tissues. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned based on attendance (minimum 70%), participation in class, and grades from partial exams. During the semester, students will take four partial exams. The final exam is mandatory, and a positive grade in the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Liker B. (2000): Osnove fiziologije stanice, Agronomski fakultet Zagreb, Poljoprivredni fakultet u Osijeku 2. Šperanda M. (2008): Anatomija i fiziologija domaćih životinja, web skripta, Poljoprivredni fakultet u Osijeku 3. Alberts, B., Bray D., Hopkin, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter P. (2013): Essential cell biology, Second Edition, Garland Science 4. Berg, J. M., Tymoczko, J. L., Stryer L. (2002): Biochemistry, Fifth Edition, W. H. Freeman and Company, UK 		
Additional literature		

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **FEEDING OF DOMESTIC ANIMALS**

1. König, H.E., Liebig H-G. (2009): Anatomija domaćih sisavaca. Naklada Slap, Zagreb
2. Dyce K. M., Sack W. O., Wensing C. J. G., (2009): Textbook of Veterinary Anatomy, Saunders, Philadelphia, London, New York, St. Lois, Sydney, Toronto

MICROBIOLOGY AND FORAGE		
Coordinator	Suzana Kristek	
Collaborators	Jurica Jović	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 18 E + 7 S)
COURSE DESCRIPTION		
Course aims	The goal is to introduce master's students to the changes in organic and inorganic compounds significant for livestock production, the activity of microorganisms, and the microorganisms responsible for these changes. The module will also explore the role and importance of microorganisms in digestion and the utilization of specific nutrients in livestock, as well as the significance of microorganisms in the production and preservation of high-quality animal feed.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, students will be able to:		
<ol style="list-style-type: none"> 1. Understand the value of proteins in livestock nutrition, the chemical composition of proteins, the importance of proteolytic enzymes, and proteolytic microorganisms. They will be able to explain the microbiological breakdown of proteins and amino acids. 2. Determine the significance of microbiological degradation of polysaccharides (starch, cellulose, hemicellulose, pectin, and lignin), microbiological degradation of monosaccharides, and biological oxidation. 3. Understand the role and importance of microorganisms in silage production and the preservation of animal feed. They will also know about feed additives and antibiotics in animal feed. 4. Understand which microorganisms and their enzymes are involved in the fermentation of animal feed, and the significance of probiotics. 5. Recognize saprophytic and pathogenic microorganisms that produce toxic substances in animal feed. 6. Understand the role of microorganisms in food digestion in ruminants, their origin, and the types of microorganisms in the rumen, the biochemical activities in the rumen, as well as the role of microorganisms in the digestion of food in other livestock (pigs, horses, poultry). 7. Identify microbial indicators and determine the quality of animal feed, understand the principles of control, microbiological standards, and legal regulations in animal feed control. 		
Assessment and evaluation of student work during classes		
To gain the right to take the final exam, students must collect a minimum number of assessment points. These points are earned through class attendance (at least 70%), active participation in class, and grades from partial exams. During the semester, students will take two partial exams. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam will be oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Duraković, S. (1991). Prehrambena mikrobiologija, Medicinska naklada. 2. Radanov-Pelagić D. (2020): Mikrobiologija stočne hrane. Poljoprivredni fakultet Novi Sad. 		
Additional literature		
<ol style="list-style-type: none"> 1. Davies, A., Bord, R. (1998): The microbiology of meat and poultry. Blackie Academic & amp. 		

KNOWLEDGE OF FEED MATERIALS		
Coordinator	Zvonimir Steiner	
Collaborators	Mario Ronnta	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (60 L + 15 E)
COURSE DESCRIPTION		
Course aims	The aim of this module is to familiarize students with the types of feed used in the nutrition of domestic animals, their properties, biological availability, and metabolism. Additionally, the goal is to educate students about the potential uses of these feeds in the nutrition of domestic animals at varying concentrations, as well as the impact of both surpluses and deficiencies of specific feeds in the diets of domestic animals.	
Course enrolment requirements	Chemistry, Anatomy and Physiology	
Intended course learning outcomes		
After successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Differentiate the anatomical and physiological characteristics of the digestive systems of different animal species and define the concept of digestibility, as well as list and explain the factors influencing it. 2. Classify nutrients, identify key representatives, and describe their physiological roles in the organism of domestic animals. 3. Explain the calculation of the energy value of feeds using modern energy units. 4. Define feeds and classify them according to the type and concentration of nutrients, origin, and water content. 5. Identify different fresh and preserved roughage feeds, concentrates, feed mixtures, by-products, and mineral feeds, as well as their roles in the diets of various animal species and categories. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is earned by collecting a minimum number of assessment points. Assessment points are earned based on attendance (minimum 70%), participation in classes, and grades from partial exams. During the semester, students will take four partial exams (in weeks 7 and 15 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 oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. M. Domaćinović (2006): Hranidba domaćih životinja, Poljoprivredni fakultet Osijek 2006.. 2. M. Brinzej i sur. (1991) : Stočarstvo. Školska knjiga – Zagreb, 1991. 3. M. Domaćinović (1999) : Praktikum vježbi hranidbe domaćih životinja. Poljoprivredni fakultet u Osijeku, 1999 4. R. Gantner i sur. (2021): Proizvodnja krmnog bilja Fakultet agrobiotehničkih znanosti Osijek 5. Senčić i sur. (2010): Proizvodnja mesa Poljoprivredni fakultet Osijek 2006 		
Additional literature		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **FEEDING OF DOMESTIC ANIMALS**

TECHNOLOGY OF FEED MIXTURE PRODUCTION		
Coordinator	Matija Domaćinović	
Collaborators	Vlatka Rozman Ivana Prakatur	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (55 L + 20 E + 5 S)
COURSE DESCRIPTION		
Course aims	The goal is to familiarize students with the technological processes involved in the handling and preparation of animal feed, as well as the process of mixing feed mixtures in feed mixers (FMs). A practical demonstration will be provided of commercialized computer models used for formulating recipes and managing the overall production of mixtures in feed mixers.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to: <ol style="list-style-type: none"> 1. Explain the importance of the chemical structure as well as the physical and technological properties of concentrated animal feeds. 2. Describe the nutritional characteristics of complete and supplementary feed mixtures, as well as premixes. 3. Interpret the correct procedures for carrying out specific technological operations in the production technology of feed mixtures. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, 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 is oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. M. Domaćinović: Tehnologija proizvodnje krmnih smjesa (radna verzija) 2022. 2. F. Dumanovski, Z. Milas: Priručnik o proizvodnji i upotrebi stočne hrane- kreme. Hrvatsko agronomsko društvo, Zagreb, 2004. 3. M Domaćinović: Praktikum vježbi hranidbe domaćih životinja. Poljoprivredni fakultet u Osijeku, 1999. 4. Korunić, Z.: Štetnici uskladištenih poljoprivrednih proizvoda, biologija, ekologija i suzbijanje. Gospodarski list, Zagreb, 1990. 		
Additional literature		
<ol style="list-style-type: none"> 1. NN, 26/1998-307: Pravilnik o kvakvoći stočne hrane 2. Z. Katić (1997): Sušenje i sušare u poljoprivredi, odabrana poglavlja, M 3. ultigraf - Zagreb. 4. D. Grbeša (2004): Metode procjene i tablice kemijskog sastava i hranjive vrijednosti krepkih krmiva, Hrvatsko agronomsko društvo, Zagreb. 		

FORAGE PRODUCTION		
Coordinator	Ranko Gantner	
Collaborators	Gordana Bukvić Goran Herman	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (40 L + 30 E + 5 S)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with modern practices in the production, storage, and use of bulky forage on arable land and pastures.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Assess the suitability of different forage crops for various soil and climate conditions. 2. Plan the sequence of agronomic measures for arable forage crops and pastures, in line with production needs and available resources. 3. Plan the conservation of bulky forages. 4. Design an optimal feeding system as a link between available natural and technological resources on one hand, and livestock requirements on the other. 		
Assessment and evaluation of student work during classes		
In determining the final grade for students, the following factors are considered: participation in class (preparation for lessons and reflective review of the teaching content), seminar paper, two partial exams, and the final exam. The evaluation of the seminar paper includes clarity, accuracy, and relevance of the information presented, as well as the overall (technical and visual) quality of the presentation. If a student misses more than 30% of the classes, they lose the the right to take the final exam.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Gantner, R., Bukvić, G., Steiner, Z. (2021): Proizvodnja krmnoga bilja. Sveučilišni udžbenik. Sveučilište J. J. Strossmayera u Osijeku, Fakultet agrobiotehničkih znanosti Osijek. 		
Additional literature		
<ol style="list-style-type: none"> 1. Barnes, R. F., Nelson, J. C., Collins, M., Moore, K. J. (2003): Forages – an introduction to grassland farming (vol.1). Blackwell Publishing Professional. Ames, Iowa, USA. 2. Barnes, R. F., Nelson, J. C., Moore, K. J., Collins, M. (2007): Forages – the science of grassland agriculture (vol.2). Blackwell Publishing Professional. Ames, Iowa, USA. 3. Erić, P., Mihailović, V., Čupina, B., Gatarić, Đ. (2004): Krmne okopavine. Monografija. Naučni institut za ratarstvo i povrtarstvo, Novi Sad. 4. Erić, P., Mihailović, V., Čupina, B., Mikić, A. (2007): Jednogodišnje krmne mahunarke. Monografija. Naučni institut za ratarstvo i povrtarstvo, Novi Sad. 5. Reheul, D., De Cauwer, B., Coughon, M. (2010): The Role of Forage Crops in Multifunctional Agriculture. U Boller, B., Posselt, U. K., Veronesi, F. (2010): Fodder Crops and Amenity Grasses (Handbook of Plant Breeding volume 5). Springer Science+Business Media, LLC, New York. 6. Stjepanović, M., Čupić, T., Gantner, R. (2012): Grašak. Sveučilišni udžbenik. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. Osijek, Hrvatska. 7. Stjepanović, M., Steiner, Z., Domaćinović, M., Bukvić, G. (2002): Konzerviranje krme. Agroekološko društvo u Osijeku. Osijek, Hrvatska. 8. Stjepanović, M., Štafa, Z., Bukvić, G. (2008): Trave za proizvodnju krme i sjemena. Sveučilišni udžbenik. Hrvatska mljekarska udruga. Zagreb, Hrvatska. 9. Stjepanović, M., Zimmer, R., Tucak, M., Bukvić, G., Popović, S., Štafa, Z. (2009): Lucerna. Sveučilišni udžbenik. Sveučilište J. J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. Osijek, Hrvatska. 10. Štafa, Z., Stjepanović, M. (2014): Ozime i fakultativne krmne culture. Zrinski d.d., Čakovec. U postupku tiskanja. 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **FEEDING OF DOMESTIC ANIMALS**

FEEDING OF RUMINANTS		
Coordinator	Zvonimir Steiner	
Collaborators	Zvonko Antunović Mario Ronta Josip Novoselec Željka Klir	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (60 L + 15 E)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with the digestion and absorption of nutrients in domestic animals. Additionally, the objective is to introduce students to the nutritional requirements of specific species and categories (cattle, sheep, and goats), and to teach them how to properly optimize feed mixtures and rations by using feed ingredients in appropriate concentrations. The goal is to acquaint students with the varying nutrient needs at different stages and levels of production in cattle, sheep, and goats.	
Course enrolment requirements	Basics of nutrition and production of fodder plants	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Distinguish the anatomical and physiological characteristics of the digestive systems of different animals and define the concept of digestibility, as well as list and explain the factors that influence it. 2. Identify feeding issues related to dairy cattle, calves, fattening cattle, and breeding heifers. Be able to formulate rations and mixtures for specific categories of animals. 3. Identify feeding issues related to sheep and goats. Be able to formulate rations and mixtures for specific categories of animals. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take four partial exams (in weeks 7 and 15 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 oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. M. Domaćinović (2006): Hranidba domaćih životinja, Poljoprivredni fakultet Osijek 2006.. 2. M. Brinzeji sur. (1991) : Stočarstvo. Školska knjiga – Zagreb, 1991. 3. M. Domaćinović (1999) : Praktikum vježbi hranidbe domaćih životinja. Poljoprivredni fakultet u Osijeku, 1999 		
Additional literature		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **FEEDING OF DOMESTIC ANIMALS**

FEEDING OF NON-RUMINANTS		
Coordinator	Matija Domaćinović	
Collaborators	Ivana Prakatur Anđelko Opačak Mario Ronta	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 20 E + 5 S)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with the nutritional standards for specific nutrients in the feeding of pigs and poultry. The course will present the nutritional significance of specific feed ingredients in the diets of pigs and poultry. It will cover the essential aspects of feeding technologies for different categories of pigs and poultry, and explain the formulation of feed mixtures for all categories of pigs and poultry. Additionally, students will learn the basic features of modern feeding technology for fish.	
Course enrolment requirements	Biochemistry and Physiology, Knowledge of Feed Materials	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. List the anatomical parts of the digestive system in poultry and pigs, and explain their function in the digestion process. 2. Explain the importance of the normative values for specific nutrients. 3. Identify the nutritional value of concentrated and bulky feed ingredients in the diets of poultry and pigs. 4. Explain how to calculate energy- and nutrient-balanced feed mixtures for the feeding of pigs and poultry. 5. Interpret the feeding requirements of different categories of pigs and poultry. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students take four 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 is oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Domaćinović, M., Z. Antunović, E. Džomba, A. Opačak, M. Baban, S. Mužić (2015): Specijalna hranidba domaćih životinja, (odabrana poglavlja), Poljoprivredni fakultet u Osijeku. 2. M. Domaćinović, M., (1999): Praktikum vježbi hranidbe domaćih životinja. Poljoprivredni fakultet u Osijeku. 3. Kirchgeßner, M., F. X. Toth, F. J. Schwarz, G. I. Stangel (2008): Tierernährung, Leitaden für Studium, Beratung und Praxis, DLG Verlag- GmbH, Frankfurt am Main. 		
Additional literature		
<ol style="list-style-type: none"> 1. Kralik G., G. Kušec, D. Kralik, V. Margeta, (2007): Svinjogojstvo, biološki i zootehnički principi, Sveučilište J.J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. 2. Senčić, Đ. (2011): Tehnologija peradarske proizvodnje. Sveučilišta J.J. Strossmayera u Osijeku, Poljoprivredni fakultet u Osijeku. 3. Rick Kleyn (2013): Chicken Nutrition: A Guide for Nutritionists and Poultry Professionals, Context Products, Ltd, England. 		

TECHNOLOGY OF ANIMAL PRODUCTION		
Coordinator	Danijela Samac	
Collaborators	Zvonko Antunović Josip Novoselec Marcela Šperanda Pero Mijić	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (65 L + 10 E)
COURSE DESCRIPTION		
Course aims	The goal is to familiarize students with the key technological processes and factors involved in the production of meat, milk, eggs, and wool.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
<p>Upon successful completion of the module, the student will be able to:</p> <ol style="list-style-type: none"> 1. Explain the assessment of breeding value in pigs, cattle, sheep, and goats. Describe breeding programs and explain the significance of molecular genetics in animal breeding. 2. Explain the induction and synchronization of estrus, ovulation, and parturition, detection of pregnancy, artificial insemination, and embryo transfer. 3. Describe the factors influencing the production and quality of poultry meat, as well as pork, lamb, goat, and beef (including genetic basis, housing systems, microclimate, sex, growth intensity, feeding methods and intensity, etc.). Explain how to model carcass and meat quality in animals. Describe the factors affecting the production and quality of beef, sheep, and goat milk (including genetic basis, housing systems, feeding frequency and methods, microclimate, lactation stage, milking frequency, etc.). Identify and explain the properties that define milk quality. List and describe the factors affecting egg production and quality. Design the quality of eggs. Explain wool quality. 4. Develop a feeding plan for different animal species and categories. Create a plan for the production of milk, meat, eggs, and wool. 5. Propose, review, and analyze relevant domestic and international scientific and professional literature on a given issue. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned based on class attendance, participation in class activities, and grades from partial exams. During the semester, students take one written exam (colloquium) and three oral 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		
<ol style="list-style-type: none"> 1. Senčić, Đ., Antunović, Z., Novoselec, J., Samac, D., Prakatur, I., Bobić, T., Kli, Ž. (2021): Tehnologija animalne proizvodnje. Sveučilište J. J. Strossmayera u Osijeku, Fakultet agrobiotehničkih znanosti Osijek. 2. Senčić, Đ. (2011): Tehnologija peradarske proizvodnje. Poljoprivredni fakultet Osijek, Osijek. 3. Senčić, Đ., Pavičić, Ž., Bukvić, Ž. (1996): Intenzivno svinjogojstvo. Nova Zemlja, Osijek. 4. Caput, P. (1996.): Govedarstvo, Celeber, Zagreb. 5. Mioč, P., Pavić, V. (2002): Kozarstvo. Hrvatska mljekarska udruga. Zagreb. 6. Mioč, P., Pavić, V., Sušić, V. (2002): Ovčarstvo. Hrvatska mljekarska udruga, Osijek. 		
Additional literature		
<ol style="list-style-type: none"> 1. Senčić, Đ. (1994): Peradarstvo. Gospodarski list, Zagreb. 2. Mitić, N., (1984): Ovčarstvo. Nolit, Beograd. 3. Uremović, Z.: Govedarstvo 4. Liker, B.: Ženski spolni sustav, interna skripta 5. Liker, B.: Muški spolni sustav, interna skripta 6. Uremović Z. i sur. (2002): Stočarstvo. Agronomski fakultet Zagreb. 		

DEVICES AND EQUIPMENT IN ANIMAL FEEDING		
Coordinator	Davor Kralik	
Collaborators		
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+EP+S)	75 (65 L + 10 E)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with the equipment used in the processes of preparation, processing, and distribution of animal feed. This includes the types and operating principles of various devices used in different livestock production systems, with a particular focus on the equipment and machinery found in animal feed mills.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Familiarize themselves with various technical systems used in the feeding process of domestic animals. 2. Dimension storage space for bulky feed. 3. Define methods for the removal and distribution of bulky feed. 4. Define methods for the distribution of concentrated feed. 5. Technologically design the distribution of feed on farms. 		
Assessment and evaluation of student work during classes		
The evaluation of student performance is regularly monitored throughout the teaching activities: attendance, participation in lectures, and exercises are all tracked. During the semester, students take three partial exams. A passing grade on the partial exams is a prerequisite for a positive final grade. Final exam is mandatory.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Gordana Kralik (2011) Zootehnika 2. Gordana Kralik (2009) Peradarstvo - biološki i zootehnički principi 3. Gordana Kralik (2007) Svinjogojstvo - biološki i zootehnički principi 		
Additional literature		
<ol style="list-style-type: none"> 1. Brčić J. (1965): Mehanizacija rada u stočarstvu 2. Brčić J. (1987, 1988, 1989): Mehanizacija u govedarskoj, svinjogojskoj i peradarskoj proizvodnji, Agrotehničar 3. Katić Z. (1982), Industrijska proizvodnja krmnih smjesa 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **FEEDING OF DOMESTIC ANIMALS**

ANIMAL HEALTH PROTECTION		
Coordinator	Boris Antunović	
Collaborators	Mislav Đidara	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (75 L)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with the diseases of domestic animals, with an emphasis on the most significant diseases from an economic perspective or due to their zoonotic potential.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Differentiate diseases based on their etiology. 2. Identify external and internal causative agents of diseases. 3. Distinguish diseases according to their economic significance or zoonotic potential. 4. Correlate pathological-anatomical changes in animals with the diagnosis of diseases. 5. Analyze individual diseases in terms of their etiology, pathogenesis, diagnosis, treatment methods, and prevention. 6. Apply methods of disease eradication for diseases controlled by law. 		
Assessment and evaluation of student work during classes		
In order to earn 6 ECTS credits, the student is required to:		
<ol style="list-style-type: none"> 1. Attend at least 70% of the classes (lectures and fieldwork). 2. Actively participate in the classes, follow the lectures, engage in discussions, and complete assigned tasks. 3. Pass the final oral exam. 		
Obligatory literature		
<ol style="list-style-type: none"> 1. Rupić, V. (2009): Zaštita zdravlja domaćih životinja, zarazne i parazitske bolesti, HMU, Zagreb. 2. Rupić, V. (2010): Zaštita zdravlja domaćih životinja, Unutrašnje i kirurške bolesti, HMU, Zagreb. 3. Rupić, V. (2010): Zaštita zdravlja domaćih životinja, fiziologija i patologija reprodukcije, osobno izdanje autora. 4. Rupić, V. (1994): Dijagnosticiranje zaraznih bolesti životinja i upala vimena, Agronomski fakultet. 		
Additional literature		
<ol style="list-style-type: none"> 1. Veterinarski priručnik (2012) (VI. izmijenjeno izdanje), Vlasta Herak-Perković, Ž. Grabarević, J. Kos (urednici): Medicinska naklada, Zagreb. 2. Cvetnić, Ž.: Bakterijske i gljivične zoonoze. Medicinska naklada. Zagreb. 3. Pugh, D.G., Baird, A.N. (2012): Sheep and goat medicine. Second edition., Elsevier 4. Divers, J.D., Peek S.F. (2008): Diseases of dairy cattle. Saunders Elsevier 		

PRACTICAL WORK II		
Coordinator	Andrijana Rebekić	
Collaborators		
Study year and semester	2nd year, 3rd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (60 L + 15 S)
COURSE DESCRIPTION		
Course aims	The goal is to familiarize students with practical solutions in the production of fresh bulky feed, the preparation of conserved bulky feed, and the production of concentrated feed mixtures for different species and categories of animals. The course will also introduce students to the practical application of feeding technology for various species and categories of domestic animals under intensive production conditions.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Interpret the organization of the process of preparing conserved feed. 2. Demonstrate management of the feed mixture production process in feed mills. 3. Organize production and feeding on a dairy farm for cows, calves, and fattening cattle. 4. Explain the key characteristics of feeding management for breeding sows, piglet rearing, and fattening pigs. 5. Develop a feeding plan for breeding poultry, laying hens, and broiler fattening. 		
Assessment and evaluation of student work during classes		
Additional literature		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **FEEDING OF DOMESTIC ANIMALS**

List of Teachers and Courses

Academic year 2022 - 23

ZOO – TECHNIQUE

University Graduate Study Programme

Major in

HUNTING AND BEEKEEPING

A full-time Study Programme

I. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
Tihomir Florijančić	Hunting II	Marcela Šperanda	10	15	15		15	6
		Tihomir Florijančić	10					
		Ivica Bošković	10					
Ivica Bošković	Hunting cynology	Ivica Bošković	25					6
		Marcela Šperanda	25					
		Tihomir Florijančić	25					
Tihomir Florijančić	Management of Hunting Grounds	Tihomir Florijančić	25		5			6
		Ivica Bošković	25					
Siniša Ozimec	Flora and Vegetation of Hunting Grounds	Siniša Ozimec	35	20	20			6
Boris Antunović	Game health protection	Boris Antunović	40	15	10			6
		Tihomir Florijančić	10					
II. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					TV	AV	LV	
Zlatko Puškadija	Beekeeping II	Zlatko Puškadija	50					6
		Marin Kovačić	10					
Edita Štefanić	Honey-providing plants	Edita Štefanić	40					6
		Zlatko Puškadija	5					
		Marin Kovačić						
		Sandra Rašić						
Drago Bešlo	Technology of bee products	Drago Bešlo	50					6
		Dejan Agić						
Snježana Tolić	Economics in Beekeeping and Hunting	Snježana Tolić	25					6
		Zlatko Puškadija	10					
		Marin Kovačić						
		Ivica Bošković	10					

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **HUNTING AND BEEKEEPING**

Igor Kralik	Market and Marketing in Beekeeping and Hunting	Igor Kralik	50	25				6
III. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					TV	AV	LV	
	Elective course							6
	Elective course							6
	Elective course							6
	Elective course							6
IV. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					TV	AV	LV	
Andrijana Rebekić	Practical work II	Andrijana Rebekić				75		6
	Master thesis							30

HUNTING II		
Coordinator	Tihomir Florijančić	
Collaborators	Ivica Bošković Marcela Šperanda	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (30 L + 30 E + 15 S)
COURSE DESCRIPTION		
Course aims	Introducing students to the biology, ecology, and zoogeography of wildlife, methods of hunting, hunting weapons, and trophies.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
<p>Upon successful completion of the module, the student will be able to:</p> <ol style="list-style-type: none"> 1. Interpret legal regulations governing the field of hunting. 2. Describe animal species classified as game. 3. Explain hunting methods and organize a hunt. 4. List and describe various types of hunting weapons and ammunition. 5. Demonstrate the evaluation of hunting trophies. 6. Critically and analytically comment on a given topic in the field of hunting. 		
Assessment and evaluation of student work during classes		
<p>Students are expected to attend classes regularly and actively participate in tasks during lectures and practical sessions. In the second part of the module, students will prepare an independent seminar paper, which is mandatory. The seminar paper will be presented orally, lasting between 10 and 15 minutes, accompanied by a PowerPoint presentation. During the module, practical shooting exercises will be organized for the students. The schedule for the presentations will be agreed upon in advance. After the lectures and practical sessions, students will take a written exam. Students are advised to take notes during the lectures and to prepare for the exam using the mandatory literature. PowerPoint presentations will be used during lectures to aid in explaining the content being discussed. These presentations will be made available to students in digital format on the Merlin platform.</p>		
Obligatory literature		
<ol style="list-style-type: none"> 1. Tucak, Z. i sur. (2002): Lovstvo, drugo prošireno izdanje. Poljoprivredni fakultet u Osijeku 2. Tucak, Z. i sur. (2006): Zaštita divljači. Poljoprivredni fakultet u Osijeku. 3. Janicki, Z. i sur. (2007): Zoologija divljači. Veterinarski fakultet Sveučilišta u Zagrebu. 4. Anonimus : Zbirka zakonskih i podzakonskih propisa iz lovstva. Ministarstvo poljoprivrede 		
Additional literature		
<ol style="list-style-type: none"> 1. Mustapić, Z. (gl.ur.) (2004): Lovstvo. Hrvatski lovački savez, Zagreb. 2. Darabuš, S. i sur. (2009): Osnove lovstva. Hrvatski lovački savez, Zagreb. 3. Frković, A. (2006): Priručnik za ocjenjivanje lovačkih trofeja. Hrvatski lovački savez, Zagreb. 		

HUNTING CYNOLGY		
Coordinator	Ivica Bošković	
Collaborators	Tihomir Florijančić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (75 L)
COURSE DESCRIPTION		
Course aims	Introducing the morphological and physiological characteristics of hunting dogs, including their reproduction and the development of their immune system. Familiarizing students with the nutritional needs and feeding methods for dogs, as well as the possibilities for their use and training techniques, and the role of hunting dogs in the performance of hunting activities.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Describe the external characteristics of hunting dog breeds and understand the functioning of the animal cell. 2. Understand the regulatory mechanisms of dog reproduction and list methods for determining pregnancy in female dogs. 3. Interpret the different forms of dog vaccination and understand the functioning of the immune system. 4. Calculate the nutritional needs of dogs based on their physiological state and work requirements. 5. Identify and distinguish the most common diseases in dogs. 6. Present training methods for different breed groups and categories of dogs. 7. Demonstrate the potential uses of hunting dogs. 8. Explain the methods for testing and evaluating hunting dogs. 		
Assessment and evaluation of student work during classes		
In determining the final grade for students, the following factors will be considered: continuous monitoring of class participation (activity during class, preparation for lessons, reflective analysis of course content), ongoing assessment and knowledge verification (partial exams), and the final written exam. Attendance at partial exams is not mandatory, final exam is mandatory. Attending classes is mandatory in accordance with the Regulations on Studies and Studying at the University of J.J. Strossmayer in Osijek. If a student misses more than 30% of the classes (more than four times), they will lose the right to attend a final exam.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Šperanda M. (2008): Anatomija i fiziologija domaćih životinja – odabrana poglavlja, web skripta 2. Pineda M. H. (2003): McDonald's Veterinary Endocrinology and Reproduction, Iowa State Press, A Blackwell Publishing Company 3. Bauer, M. (1985): Pas moj prijatelj. Liber, Zagreb. 4. Frandson D. i sur. (2009): Anatomy and Physiology of Farm Animals, Wiley-Blackwell, Philadelphia 5. Cvetnić, S. (1983): Virusne bolesti životinja, Stvarnost, JAZU, Zagreb 6. Tucak i sur. (2003): Lovna kinologija, Poljoprivredni fakultet u Osijeku 		
Additional literature		

MANAGEMENT OF HUNTING GROUNDS		
Coordinator	Tihomir Florijančić	
Collaborators	Ivica Bošković	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 E)
COURSE DESCRIPTION		
Course aims	Familiarizing students with various methods of game breeding and protection; the process of assessing habitat quality to determine the carrying capacity of hunting grounds for specific species of game and the management of hunting areas.	
Course enrolment requirements	Hunting II, Flora and Vegetation of Hunting Grounds	
Intended course learning outcomes		
<p>Upon successful completion of the module, the student will be able to:</p> <ol style="list-style-type: none"> 1. Break down methods of game and hunting ground management. 2. Assess hunting productivity areas, hunting ground quality, and the economic capacity of hunting grounds. 3. Plan management guidelines for hunting grounds for specific species of game. 4. Evaluate the type, number, and distribution of hunting and game management structures within the hunting area. 5. Assess the nutrition and supplementary feeding of game in a specific hunting ground. 6. Plan game breeding in controlled conditions. 		
Assessment and evaluation of student work during classes		
<p>Students are expected to attend classes regularly and actively participate in tasks during lectures and practical sessions. In the second part of the semester, mandatory field exercises will be organized for students in both open and enclosed hunting grounds or game breeding facilities. After the lectures and practical sessions, students will take a written exam. The final exam will be oral. Students are advised to take notes during lectures and to prepare for the exam using the mandatory literature. PowerPoint presentations will be used during lectures to aid in explaining the content discussed. These presentations will be made available to students in digital format on the Merlin platform.</p>		
Obligatory literature		
<ol style="list-style-type: none"> 1. Tucak, Z. i sur. (2002): Lovstvo, drugo prošireno izdanje. Poljoprivredni fakultet u Osijeku 2. Sertić, D. (2008): Uzgoj krupne divljači i uređenje lovišta. Veleučilište u Karlovcu, Karlovac. 3. Pintur, K. (2010): Uzgoj sitne divljači. Veleučilište u Karlovcu, Karlovac. 4. Degmečić (2011): Selekcija jelenske i srneće divljači, Hrvatski lovački savez, Zagreb. 5. Anonimus : Zbirka zakonskih i podzakonskih propisa iz lovstva. Ministarstvo poljoprivrede 6. Tucak, Z. i sur. (2006): Zaštita divljači. Poljoprivredni fakultet u Osijeku. 		
Additional literature		
<ol style="list-style-type: none"> 1. Mustapić, Z. (gl.ur.) (2004): Lovstvo. Hrvatski lovački savez, Zagreb. 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **HUNTING AND BEEKEEPING**

FLORA AND VEGETATION OF HUNTING GROUNDS		
Coordinator	Siniša Ozimec	
Collaborators		
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (35 L + 20E + 20 S)
COURSE DESCRIPTION		
Course aims	Introducing students to the flora, vegetation, and habitat types in the Republic of Croatia as key components in planning activities for hunting ground and game management.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Differentiate between flora and vegetation. 2. Analyze vegetation zones and belts in accordance with the natural-geographic characteristics of Croatia. 3. Identify several rare and endangered plant species of Croatian flora. 4. List the main classes of habitat types. 5. Interpret maps of habitat types, protected areas, and ecological network areas. 6. Link the composition of vegetation and habitat structure in hunting grounds with the quality and capacity of the hunting area. 		
Assessment and evaluation of student work during classes		
In determining the final grade, the following factors will be taken into account: regular attendance (minimum 70% of classes), participation in class activities, the preparation and presentation of the seminar paper, and the final oral exam. The criteria for evaluating the seminar paper include: the scope of the topic, relevance of the data, and the technical and visual quality of the presentation. The right to take the final exam is earned by accumulating a minimum number of grading points. The final exam is mandatory, conducted orally, and a passing grade on the final exam is a prerequisite for achieving a positive final grade.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Tucak, Z., Florijančić, T., Grubišić, M., Topić, J., Brna, J., Dragičević, P., Tušek, T., Vukušić, K. (2002.): Lovstvo, drugo prošireno izdanje. Sveučilište J.J. Strossmayera u Osijeku, Poljoprivredni fakultet, Osijek. 2. Topić, J., Vukelić, J. (2009.): Priručnik za određivanje kopnenih staništa u Hrvatskoj prema Direktivi o staništima EU. Državni zavod za zaštitu prirode, Zagreb. 3. Vukelić, J. (2012): Šumska vegetacija Hrvatske. Šumarski fakultet, Državni zavod za zaštitu prirode. 4. DZZP (2018): Nacionalna klasifikacija staništa Republike Hrvatske, 5. verzija (on-line). Državni zavod za zaštitu prirode, Zagreb. 		
Additional literature		
<ol style="list-style-type: none"> 1. Prlić, D. (2021.): Terenska nastava iz vegetacijske ekologije. Sveučilište Josipa Jurja Strossmayera u Osijeku, Odjel za biologiju, Osijek. 2. Safner, R. (2022.): Zeleno lovstvo – zaštita okoliša i očuvanje prirodne ravnoteže. Školska knjiga, Zagreb. 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **HUNTING AND BEEKEEPING**

GAME HEALTH PROTECTION		
Coordinator	Boris Antunović	
Collaborators	Tihomir Forijančić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 10E + 15 S)
COURSE DESCRIPTION		
Course aims	Acquainting students with wildlife diseases, with a focus on the most significant diseases from an economic perspective or due to their zoonotic potential.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Distinguish diseases based on their etiology. 2. Identify both external and internal causative agents of diseases. 3. Differentiate diseases according to their economic significance or zoonotic potential. 4. Relate pathological-anatomical changes in animals to disease diagnosis. 5. Analyze individual diseases in terms of their etiology, pathogenesis, diagnostics, treatment methods, and prophylaxis. 6. 12. Apply disease eradication methods for diseases regulated by law. 		
Assessment and evaluation of student work during classes		
To earn 6 ECTS credits, the student is required to:		
<ol style="list-style-type: none"> 4. Attend a minimum of 70% of the classes (lectures and fieldwork); 5. Be active in class, follow the lectures, participate in discussions, and complete assigned tasks; 6. Pass the final exam. 		
Obligatory literature		
<ol style="list-style-type: none"> 1. Cvetnić, S. (1993): Opća epizootiologija. Školska knjiga, Zagreb. 2. Mustapić, Z. i sur. (2004): Lovstvo. Hrvatski lovački savez, Zagreb. 3. Pintur, K. (2010): Uzgoj sitne divljači. Veleučilište u Karlovcu, Sveučilište J.J. Strossmayer u Osijeku, Poljoprivredni fakultet, Osijek. 4. Tucak, Z., Florijančić, T., Grubešić, M., Topić, J., Brna, J., Dragičević, P., Tušek, T., Vukušić, K. (2002): Lovstvo (drugo prošireno izdanje). Sveučilište J.J. Strossmayer u Osijeku, Poljoprivredni fakultet, Osijek. 		
Additional literature		
<ol style="list-style-type: none"> 1. Rupiće, V. (2009): Zaštita zdravlja domaćih životinja, zarazne i parazitske bolesti, HMU, Zagreb. 2. Veterinarski priručnik (2012) (VI. izmijenjeno izdanje), Vlasta Herak-Perković, Ž. Grabarević, J. Kos (urednici): Medicinska naklada, Zagreb. 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **HUNTING AND BEEKEEPING**

BEEKEEPING II		
Coordinator	Zlatko Puškadija	
Collaborators	Prof. Marin Kovačić	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (60 L + 15 P)
COURSE DESCRIPTION		
Course aims	Familiarize students with the biology of the honeybee as a social insect, including communication within the hive. Introduce students to the organizational requirements of larger beekeeping operations, specialized production of bee products, and the logistics of hive relocation.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Describe the functioning of the bee colony, the communication between bees, and their spatial orientation. 2. Organize the production of bee products in a larger beekeeping operation. 3. Describe the production of pollen, propolis, royal jelly, and bee venom. 4. Select the appropriate methods for storing and preserving bee products. 5. Organize the production of bee nuclei for personal use or for the market. 6. Describe the breeding of queen bees for personal use or for the market. 7. Recognize the symptoms of swarming instinct in a bee colony. 8. Explain the technical and technological solutions for migratory beekeeping. 9. Apply ecological principles in the control of parasitic and infectious diseases of bees, as well as in the management of bee enemies and pests. 		
Assessment and evaluation of student work during classes		
Students' work is evaluated and graded based on the outlined assessment criteria for each element, which they have been informed about and are publicly available.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Tucak, Z., Bačić, T., Horvat, S., Puškadija, Z. (2005): Pčelarstvo, treće prošireno izdanje. Poljoprivredni fakultet, Osijek 2. Laktić, Z., Šekulja, D. (2008): Suvremeno pčelarstvo. Nakladni zavod Globus, Zagreb 3. Smjernice za „Dobru pčelarsku praksu“ prema načelima HACCP sustava, Hrvatski pčelarski savez 		
Additional literature		
<ol style="list-style-type: none"> 1. Kapš, Peter (2013): Liječenje pčelinjim proizvodima – Apiterapija, Geromar d.o.o., Bestovje 2. Goodman, L. (2003): Form and function in the honey bee, International Bee Research Association, Cardiff 3. Winston, M.L. (1987): The biology of the honey bee, Harvard University Press, USA. 		

HONEY-PROVIDING PLANTS		
Coordinator	Edita Štefanić	
Collaborators	Sanda Rašić	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	Familiarize students with the biology of the honeybee as a social insect, including communication within the hive. Introduce students to the organizational requirements of larger beekeeping operations, specialized production of bee products, and the logistics of hive relocation.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to: <ol style="list-style-type: none"> 1. Identify the most significant species of honey-producing plants. 2. Collect and prepare samples for honey analysis. 3. Recognize the most important pollen grains in honey. 4. Determine the botanical origin and geographical provenance of honey. 5. Calculate the nectar potential of a specific area. 6. Prepare and organize a beekeeping apiary based on the pollination requirements of the crops being cultivated. 		
Assessment and evaluation of student work during classes		
Eligibility to approach the final exam is determined by accumulating a minimum number of grading points. These points are awarded based on class attendance (at least 70%), active participation in class, and performance on partial exams. Throughout the semester, students complete two partial exams and independently collect plants for their herbarium. The final exam is mandatory, and achieving a passing grade on the final exam is a prerequisite for taking the oral exam on the herbarium.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Bučar, M. (2008): Medonosne biljke kontinentalne Hrvatske. Biblioteka: naš okoliš. 2. Fossel, A. (2000): Bienen und Blumen. Institut fur Bienenkunde. Lunz am See. 3. Erdtman, G. (1993): Pollen Analysis. Chronica Botanica Company 		
Additional literature		
<ol style="list-style-type: none"> 1. Umeljić, V. (2004): U svijetu cvijeća i pčela. Atlas medonosnog bilja. Čvorak, Zagreb. 		

TECHNOLOGY OF BEE PRODUCTS		
Coordinator	Drago Bešlo	
Collaborators	Dejan Agić	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 P)
COURSE DESCRIPTION		
Course aims	Familiarizing students with bee products, including the physical-chemical and functional properties of honey, propolis, pollen, beeswax, bee venom, and royal jelly. Understanding the importance of chemical analyses for the use of bee products in the pharmaceutical and food industries, as well as in agriculture. Emphasizing the significance of monitoring honey quality to make informed decisions about bee foraging and to obtain the highest quality bee products.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Recognize and differentiate bee products and describe the characteristics of honey and other bee products. 2. Describe the properties of bee products. 3. Connect the importance and location of bee foraging with the quality of bee products. 4. Explain the significance of using bee products for nutrition and antioxidant activity. 5. Explain the importance of applying lyophilization to certain bee products. 6. Apply proper methods for storing honey to prevent crystallization; if crystallization occurs, demonstrate how to decrystallize it without compromising its chemical properties. 7. Relate the determination of the chemical composition of honey and other bee products to their use in the chemical and pharmaceutical industries. 8. Apply knowledge of the chemical composition of honey and other bee products in the food industry and agriculture. 9. Classify honey and other bee products using data obtained through chemical and physical methods of analysis. 10. Plan the sequence of activities in practical work and laboratory settings. 		
Assessment and evaluation of student work during classes		
In determining the final grade, the following factors will be taken into account: regular attendance (minimum 70% of classes), participation in class activities, the preparation and presentation of the seminar paper, and the final oral exam. The criteria for evaluating the seminar paper include: the scope of the topic, relevance of the data, and the technical and visual quality of the presentation. The right to take the final exam is earned by accumulating a minimum number of grading points. The final exam is mandatory, conducted orally, and a passing grade on the final exam is a prerequisite for achieving a positive final grade		
Obligatory literature		
<ol style="list-style-type: none"> 1. P. Kapš (2013) Liječenje pčelinjim proizvodima-apiterapija, Biblioteka Dobar život, Sveta Nedelja, 2. D. Bešlo (2011) Power Point prezentacije, Poljoprivredni fakultet u Osijeku, 2011. 3. D. Bešlo (2014) Laboratorijske vježbe iz biokemije, skripta Poljoprivredni fakultet u Osijeku 4. D. Bešlo, D. Agić (2011) Laboratorijske vježbe iz tehnologije pčelarskih proizvoda, Poljoprivredni fakultet u Osijeku (interna skripta) 		
Additional literature		
<ol style="list-style-type: none"> 1. Jeremy M. Berg, John L. Tymoczko, L. Stryer (2013) Biokemija, 6. Englesko izdanje i 1. Hrvatsko izdanje, Školska knjiga (knjiga) 2. P. Karlson (1993) Biokemija, Školska knjiga (knjiga) 3. D. Amić (2008) Organska kemija za studente agronomске struke, Školska knjiga, Zagreb (knjiga) 		

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **HUNTING AND BEEKEEPING**

4. Gatto Gregory, Berg Jeremy M, Stryer Lubert Tymoczko John L- (2019): Biochemistry, 9th Edition, MACMILLAN (knjiga).

ECONOMICS IN BEEKEEPING AND HUNTING		
Coordinator	Snježana Tolić	
Collaborators	Zlatko Puškadija Marin Kovačić Ivica Bošković	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (45 L + 30 S)
COURSE DESCRIPTION		
Course aims	The aim of the course is to acquire theoretical knowledge in the field of agricultural economics, with the application of learned principles and methodologies in hunting and beekeeping. Upon completion of the course, students will be able to: write a business plan, analyze the operations of a company or the production of a specific product, and select appropriate financing for various business needs.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Select the technology and production structure for a farm specializing in beekeeping. 2. Select the technology and production structure for a farm specializing in hunting. 3. Calculate technological and financial performance indicators for selected types of production and services. 4. Choose the organizational and legal form of business and determine the approach to the VAT system. 5. Improve the financial performance of a given farm specialized in production or services in hunting or beekeeping. 6. Plan and implement investments in hunting and beekeeping. 		
Assessment and evaluation of student work during classes		
In determining the final grade, the following factors will be taken into account: regular attendance (minimum 70% of classes), participation in class activities, partial exams, and the final oral exam. The right to take the final exam is earned by accumulating a minimum number of grading points. The final exam is mandatory, conducted orally, and a passing grade on the final exam is a prerequisite for achieving a positive final grade.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Zmaić, K. (2008): Osnove agroekonomike. Osijek: Poljoprivredni fakultet Sveučilišta Josipa Jurja Strossmayera u Osijeku 2. Štefanić, I. (2015): Inovativno poduzetništvo - priručnik za studente, inovativne poduzetnike i poduzetne znanstvenike. Osijek: Sveučilište Josipa Jurja Strossmayera u Osijeku, 2015. 3. Crikveni Filipović, T. (ur)(2022): Obiteljska poljoprivredna gospodarstva – Računovodstvo, porezi, trgovina, usluge I fiskalizacija. II izmijenjeno I dopunjeno izdanje. Biblioteka Računovodstvo, Zagreb, 2022. 		
Additional literature		
<ol style="list-style-type: none"> 1. Odak, A., Rajaković, M., Žabojec, M. (2021). Financijska perspektiva Europske unije 2021.-2027. s naglaskom na kohezijsku politiku. Školska knjiga, Zagreb 		

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **HUNTING AND BEEKEEPING**

MARKET AND MARKETING IN BEEKEEPING AND HUNTING		
Coordinator	Igor Kralik	
Collaborators		
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 S)
COURSE DESCRIPTION		
Course aims	Guide students in the module to acquire additional knowledge about the importance of linking agricultural production with the market and food marketing.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Explain and define the stages of market research. 2. Compare market research methods and distinguish how to organize the marketing process using examples from the hunting and beekeeping markets. 3. Organize and integrate a Marketing Information System (MIS). 4. Apply the elements of the marketing mix using examples from the hunting and beekeeping markets. 5. Create and organize the distribution of products. 		
Assessment and evaluation of student work during classes		
In determining the final grade, the following factors will be taken into account: regular attendance (minimum 70% of classes), participation in class activities. The right to take the final exam is earned by accumulating a minimum number of grading points. The final exam is mandatory, conducted orally, and a passing grade on the final exam is a prerequisite for achieving a positive final grade During the semester, students take two partial exams (in the 7th and 15th weeks of the course).		
Obligatory literature		
<ol style="list-style-type: none"> 1. Karpat , T,(1992): Transparentnost tržišta, marketng, etika. HAZU, Osijek 2. Meler, M,: (1999): Marketng, Sveučilište J.J. Strossmayera Osijek, Osijek 		
Additional literature		
<ol style="list-style-type: none"> 1. Segetlija, Z.; Lamza-Maronić, M,(1995): Distribucijski sustav trgovinskoga poduzeća, Sveučilište J.J. Strossmayera Osijek, 2. Tolušić, Z. (2012): Tržište I distribucija poljoprivredni-prehrambenih proizvoda, Poljoprivredni fakultet, Osijek 		

PRACTICAL WORK II		
Coordinator	Andrijana Rebekić	
Collaborators		
Study year and semester	2nd year, 3rd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (60 L + 15 E)
COURSE DESCRIPTION		
Course aims	Familiarize students with habitats and hunting grounds, the construction of hunting-technical and hunting-economic facilities, breeds of hunting dogs, types of beehives, beekeeping tools and equipment, as well as the organization of production in hunting and beekeeping.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Assess the ecological factors of habitats in order to determine the economic capacity of hunting grounds. 2. Design and construct hunting-technical and hunting-economic facilities. 3. Plan the feeding of game (nutrition and supplementary feeding, game feeding stations). 4. Organize game hunting. 5. Demonstrate the use of hunting dogs. 6. Organize and establish a beekeeping apiary. 7. Identify and conduct organoleptic analysis of different types of honey. 8. Organize work with beehives, beekeeping tools, and bee products. 		
Assessment and evaluation of student work during classes		
Students are expected to attend classes regularly and actively participate in tasks during field exercises in the hunting grounds and beekeeping apiary. At the beginning of the semester, students will be informed about the schedule and location of the field classes, and they are required to maintain a practice diary of their activities. The final grade will take into account continuous monitoring of attendance (class participation, preparation for lessons, and reflective review of course content), practical work in the hunting grounds or beekeeping apiary, as well as the practice diary.		
Obligatory literature		
Additional literature		

List of Teachers and Courses

Academic year 2022 - 23

ZOO – TECHNIQUE

University Graduate Study Programme

Major in

SPECIAL ZOO - TECHNIQUE

A full-time Study Programme

I. semester									
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS	
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES				
					FE	AE	LE		
Drago Bešlo	Biochemistry	Drago Bešlo Dejan Agić	50				25	6	
Zoran Škrtić	Biometrics in Zoo-technique	Zoran Škrtić Zlata Kralik	50			15 10		6	
Marcela Šperanda	Physiology of Domestic Animals	Marcela Šperanda Mislav Đidara	60 5			5	5	6	
Mirjana Baban	Horse breeding II	Mirjana Baban Maja Gregić	30	20		25		6	
Pero Mijić	Milk and beef production technology	Pero Mijić Tina Bobić	35	10 10			20	6	
II. semester									
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS	
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES				
					FE	AE	LE		
Vladimir Margeta	Biological and Zoo-technical Principals in Pig breeding	Vladimir Margeta Kristina Gvozdanović	30 20				10 15	6	
Zoran Škrtić	Biological and Zoo-technical Principals in Poultry Production	Zoran Škrtić Zlata Kralik	40	10		5	10 10	6	
Zvonko Antunović	Sheep and goat breeding II	Zvonko Antunović Josip Novoselec Željka Klir Šalavardić	30 10	15 5			5 10	6	
Boris Lukić	Quantitative genetics and selection	Nikola Raguž Boris Lukić	23 22				15 15	6	
Ivona Djurkin Kušec	Animal Products - Quality Control	Goran Kušec Ivona Djurkin Kušec	15 20		10	5 5		10 10	6

III. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
	Elective course							6
	Elective course							6
	Elective course							6
	Elective course							6
IV. semester								
COORDINATOR	COURSE NAME	TEACHERS ON THE COURSE AND TYPE OF CLASSES						ECTS
		NAME AND SURNAME	LECTURES	SEMINARS	EXERCISES			
					FE	AE	LE	
Andrijana Rebekić	Practical work II	Andrijana Rebekić				75		6
	Master thesis							30

ZOO – TECHNIQUE (University Graduate Study Programme)
Major in **SPECIAL ZOO - TECHNIQUE**

BIOCHEMISTRY		
Coordinator	Drago Bešlo	
Collaborators	Dejan Agić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 P)
COURSE DESCRIPTION		
Course aims	Introduce students to catabolism and the generation of chemical energy within cells. Familiarize students with the biosynthesis of macromolecules and highlight the importance of metabolic processes in multicellular organisms, as well as the regulation of gene expression. Emphasize the significance of hormonal regulation and immune responses, and their dependence on environmental factors.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
<p>Upon successful completion of the module, the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the mechanisms regulating catabolism and anabolism in animal cells. 2. Connect and compare metabolic processes in organs with intensive growth. 3. Explain the importance of determining the rate of the glycolytic pathway during intensive growth. 4. Link the significance of storing and preserving information with the expression of specific genes. 5. Summarize the mechanisms of nonspecific and specific immune responses. 6. Recognize the importance of the immune response and the cell cycle. 7. Discuss and identify the significance of gene manipulation. 8. Plan the sequence of activities in practical and laboratory settings. 		
Assessment and evaluation of student work during classes		
<p>Eligibility to approach the final exam is earned by accumulating a minimum number of grading points. Grading points are awarded based on class attendance (minimum 70%), active participation in class, and scores from partial exams. During the semester, students take four partial exams (in the 4th, 8th, 12th, 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 consists of both written and oral components.</p>		
Obligatory literature		
<ol style="list-style-type: none"> 1. Berg Jeremy M, Tymoczko John L., Stryer Lubert (2013), Biokemija, 6. izdanje engleskog i 1. izdanje hrvatsko, Školska knjiga, Zagreb 2. Bešlo Drago (2014) Praktikum iz biokemije, Poljoprivredni fakultet u Osijeku,(skripta) 3. EllioΣ, H. W. (2004): Biochemistry and molecular biology. Oxford University Press. (knjiga) 4. McMurry John and Castellion Mary (2003) Fundamentals General, Organic, and Biological Chemistry, Four Edition, Pentice hall, UK; (knjiga) 		
Additional literature		
<ol style="list-style-type: none"> 1. Alberts Bruce, Bray Dennis, Hopkin Karen, Johnson Alexander, Lewis Julian, Raff Martin, Roberts Keith, Peter Walter Peter (2004): Essential cell biology, Second Edition, Garland Science, UK (knjiga) 2. Gatto Gregory, Berg Jeremy M, Stryer Lubert Tymoczko John L- (2019): Biochemistry, 9th Edition, MACMILLAN (knjiga). 3. Harvey Lodish, Arnold Berk, S. Lawrence Zipursky, Paul Matsudaira, David Baltimore and James Darnell (2000): Molecular cell biology, Fourth Edition, W. H. Freeman and Company, UK: 4. Elliott, H. W. (2004): Biochemistry and molecular biology. Oxford University Press(knjiga) 		

BIOMETRICS IN ZOO-TECHNIQUE		
Coordinator	Zoran Škrtić	
Collaborators	Zlata Kralik	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 P)
COURSE DESCRIPTION		
Course aims	Introduce and train participants in basic statistical methods, including designing and conducting experiments. Focus on the analysis and interpretation of results obtained from research.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to: <ol style="list-style-type: none"> 1. Describe the statistical methods used in animal science (zootechnics). 2. Select the appropriate statistical method based on the assigned written task. 3. Use statistical software packages when working with computers. 4. Comment on the results obtained from statistical calculations. 5. Compare different types of applied statistical methods. 6. Interpret the results obtained from hypothesis testing. 7. Justify the choice of a specific statistical method used in particular calculations. 		
Assessment and evaluation of student work during classes		
Eligibility to approach the final exam is earned by accumulating a minimum number of grading points. Grading points are awarded based on class attendance (minimum 70%), active participation in class, and grades from 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		
<ol style="list-style-type: none"> 1. Barić, Stana, Car, M. (1972): *Metodika znanstvenih istraživanja u stočarstvu*. 2. Kralik, Gordana, Škrtić, Z., Kralik, Zlata (2012): *Biometrika u zootehnici*. Sveučilište J.J. Strossmayera u Osijeku. 3. Snedecor, G. W., Cochran, W. G. (1988): *Statistical Methods*. Ames, Iowa, USA. 4. Šošić, J., Serdar, V. (2000): *Uvod u statistiku*. Školska knjiga, Zagreb. 		
Additional literature		
<ol style="list-style-type: none"> 1. Manuals for Using Statistical Software 		

PHYSIOLOGY OF DOMESTIC ANIMALS		
Coordinator	Marcela Šperada	
Collaborators	Prof. Mislav Đidara	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 E)
COURSE DESCRIPTION		
Course aims	Familiarize students with metabolic processes in multicellular organisms, the profile of each organ, and the regulation of gene expression. Introduce students to the microstructure of the digestive system, the physiology of digestion, and the key aspects of biochemical processes related to the liver, muscle tissue, kidneys, adipose tissue, food absorption regulation, and maintenance of energy balance. Study the immune system. Introduce neuroendocrine mechanisms and their dependence on environmental factors, as well as hormonal regulation of reproduction, growth, and lactation.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Explain the regulation of water and electrolytes in multicellular organisms. 2. Interpret the functional anatomy of the digestive system. Integrate the intermediate conversion of nutrients with specific sections of the digestive organs and cellular compartments. 3. Analyze the effect of digestive system hormones on digestion processes and explain the hormonal regulation of food intake and the distribution of nutrients depending on metabolic state. 4. Integrate the importance of fat-soluble vitamins and essential minerals from nutritional, endocrine, and immune system perspectives. 5. Describe the structure of the mammary gland, explain its development, and the neuroendocrine regulation of milk production and release. 6. Explain the functioning of the endocrine system. 		
Assessment and evaluation of student work during classes		
Eligibility to approach the final exam is earned by accumulating a minimum number of grading points. Grading points are awarded based on class attendance (minimum 70%), active participation in class, and grades from partial exams. During the semester, students will take four 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		
<ol style="list-style-type: none"> 1. Liker B. (2000): Osnove fiziologije stanice, Agronomski fakultet Zagreb, Poljoprivredni fakultet u Osijeku 2. Šperanda M. (2008): Anatomija i fiziologija domaćih životinja, web skripta, Poljoprivredni fakultet u Osijeku 3. Sjaasstad, O. V., Hove, K., Sand O. (2010): Physiology of domestic animals, Scandinavian veterinary Press (knjiga) 4. Ganong W. F. (2012): Rewiew of Medical Physiology. Lange medical Books/McGraw-Hill. New York, Sydney, Tokyo, Toronto (knjiga) 		
Additional literature		
<ol style="list-style-type: none"> 1. Alberts, B., Bray D., Hopkin, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter P. (2013): Essential cell biology, Second Edition, Garland Science 2. Konig, H.E., Liebig H-G. (2009): Anatomija domaćih sisavaca. Naklada Slap, Zagreb 3. Dyce K. M., Sack W. O., Wensing C. J. G., (2009): Textbook of Veterinary Anatomy, Saunders, Philadelphia, London, New York, St. Lois, Sydney, Toronto 4. Reece W. O. (2010): Physiology of domestic animals, Williams and Wilkins 5. Frandson D. i sur. (2009): Anatomy and Physiology of Farm Animals, Wiley-Blackwell, Philadelphia 		

HORSE BREEDING II		
Coordinator	Mirjana Baban	
Collaborators	Maja Gregić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (65 L + 10 P)
COURSE DESCRIPTION		
Course aims	Familiarize students with breeding methods in horse husbandry, various ways of evaluating different horse breeds, performance testing, practical value of horses, and the equine industry.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
<p>Upon successful completion of the module, the student will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the importance of the equine industry, evaluate the correctness of a horse's conformation, gaits, and functional suitability. 2. Understand the genetic foundation and heritability of traits, systems for testing and evaluation, and methods for implementing breeding programs. 3. Define and explain breeding methods, traditional and other equestrian competitions. 4. Explain legal standards and regulations, breeding documentation, equine institutions and organizations, and training of sport horses. 5. Familiarize with FEI (Fédération Equestre Internationale) rules regarding the organization of competitions, evaluation, judging, behavior, and other related aspects. 6. Define terms and rules related to Olympic and racing equestrian competitions. 7. Understand doping in equestrian competitions, describe modern reproductive techniques for horses, horse injuries, and injury prevention. 8. Become familiar with inherited, infectious, and parasitic diseases in horses. 9. Apply horse care techniques and training methods for young horses, and explain alternative uses of horses. 		
Assessment and evaluation of student work during classes		
Eligibility to take the final exam is earned by accumulating a minimum number of assessment points. Assessment points are awarded based on class attendance (minimum 70%), active participation in class, and scores from partial exams. During the semester, students will 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		
Additional literature		

MILK AND BEEF PRODUCTION TECHNOLOGY		
Coordinator	Pero Mijić	
Collaborators	Tina Bobić	
Study year and semester	1st year, 1st semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (35 L + 20 E + 20 S)
COURSE DESCRIPTION		
Course aims	Students will be introduced to the technology of milk and meat production in cattle. The course will cover the impact on milk quantity and composition, as well as the effects on individual milk components, the growth rate of calves, and meat quality. Students will be trained to address specific challenges in cattle breeding and management.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
After successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Explain the ecological role of cattle and manage an environmentally sustainable family farm. 2. Apply methods for increasing milk and meat production in cattle farming. 3. Explain the concept and rationale behind breeding programs in cattle. 4. List the traits assessed for the overall breeding index of cattle in Croatia and, based on breeding evaluations, suggest the selection of appropriate parents for further breeding, considering the production direction. 5. Analyze the lactation curve and different types and technologies of cow milk production, and make adjustments in the technology based on the appearance of the lactation curve. 6. Propose optimal solutions for maintaining consistency in milk production and apply the best methods for increasing milk and meat production in cattle. Recognize the factors that affect the composition and quantity of milk, and suggest improvements for production. 7. Use the Lacto-Corder measuring device to monitor the milking process and assess udder health using the mastitis indicator. 		
Assessment and evaluation of student work during classes		
The forms of monitoring and assessment of student knowledge will include both written and oral components. In determining the final grade for students, several factors will be considered: continuous monitoring of class participation (including activity in class, preparation for lessons, and reflective commentary on the course content), continuous assessment and evaluation of knowledge (through partial exams), and the final oral exam. Attendance is mandatory in accordance with the Regulations on Studies and Study Procedures at the University of J. J. Strossmayer in Osijek. If a student misses more than 30% of the class hours (more than four times), they will lose the right to attend a final exam.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Ivanković, A., Mijić, P. (2020): Govedarstvo. Agronomski fakultet, Sveučilište u Zagrebu; Fakultet agrobiotehničkih znanosti Osijek, Sveučilište J. J. Strossmayera u Osijeku, Zagreb. (udžbenik) 		
Additional literature		
<ol style="list-style-type: none"> 1. Senčić, Đ., Antunović, Z., Novoselec, J., Samac, D., Prakatur, I., Bobić, T., Klir, Ž. (2021.): Tehnologija animalne proizvodnje. Fakultet agrobiotehničkih znanosti Sveučilišta Josipa Jurja Strossmayera u Osijeku, Osijek. (udžbenik) 2. Caput, P. (1996): Govedarstvo. Celeber, d.o.o., Zagreb. (udžbenik) 3. Uremović, Z. (2004): Govedarstvo. Hrvatska mljekarska udruga, Zagreb. (udžbenik) 4. Godišnja izvješća o stanju u govedarstvu Hrvatske agencije za hranu i poljoprivredu. 5. Bobić, T., Mijić, P., Gregorić, M., Ivkić, Z., Baban, M. (2013): The influence of ordinal number and stage of lactation on milkability traits in Holstein cows. <i>Mljekarstvo</i> 63 (3), 172–179. 6. Caput P., Ivanković A., Mioč B. (2010): Očuvanje biološke raznolikosti u stočarstvu. Hrvatska mljekarska udruga, Zagreb. (udžbenik) 		

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **SPECIAL ZOO - TECHNIQUE**

7. Senčić Đ., Antunović Z., Mijić P., Baban M., Puškadija Z. (2011): Ekološka zootehnika. Poljoprivredni fakultet u Osijeku, Osijek.

BIOLOGICAL AND ZOO-TECHNICAL PRINCIPALS IN PIG BREEDING		
Coordinator	Vladimir Margeta	
Collaborators	Kristina Gvozdanović	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (50 L + 25 E)
COURSE DESCRIPTION		
Course aims	The goal is to familiarize students with the significance of pig farming, as well as the biologically and economically most important characteristics of pigs. Additionally, the course will explain the technological processes involved in pig production.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Plan and design an optimal pig farming production system. 2. Identify the selection procedures necessary for the successful implementation of production systems. 3. Recognize the bioethical components and apply them to the improvement of specific production systems. 4. Identify genetic factors that affect the success of pig production and pork quality. 5. Design alternative production systems in pig farming that meet animal welfare and health standards, as well as environmental protection criteria. 6. Develop an appropriate market strategy as a prerequisite for economically viable and profitable pig farming production. 7. Discuss, argue, and critically assess a given topic in the field of pig farming production. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned through class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students are required to take three partial exams. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Kralik, G., Zdeněk, A., Baban, Mirjana, Bogut, I., Gantner, V., Ivanković, S., Katavić, I., Kralik, D., Kralik, I., Margeta, V., Pavličević, J. (2011): Zootehnika. Grafi ka, Osijek. 2. Kralik G., Kušec G., Kralik D., Margeta V. (2007): Svinjogojstvo – biološki i zootehnički principi. Sveučilišni udžbenik, Grafi ka d.o.o. Osijek. Kralik, G. Svinjogojstvo. 3. Rotchild, M. F., Ruvinski, A. (2010): GeneΘ c of Pig. CABI Publishing 4. Blair, R. (2007): NutriΘ on and Feeding of Organic Pigs. CABI Publishing 5. Faucitano, L., Schaefer, A.L. (2008): Welfare of pigs: from birth to slaughter. Wageningen Academic Publisher. 6. Kebreab, E. (2013): Sustainable Animal Agriculture. CABI Publishing. 		
Additional literature		

BIOLOGICAL AND ZOO-TECHNICAL PRINCIPALS IN POULTRY PRODUCTION		
Coordinator	Zoran Škrtić	
Collaborators	Zlata Kralik	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (40 L + 25 P + 10 S)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize participants with advanced techniques in reproduction, incubation, and selection, as well as the physiology of growth, breeding conditions, and the welfare of poultry.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Describe the processes of reproduction, incubation, and selection in poultry. 2. Explain the importance of environmental conditions and animal welfare for poultry production. 3. Describe the physiology of growth, including muscle, bone, and fat tissue development, and apply mathematical models to describe growth patterns. 4. Interpret the nutritional needs of various poultry species and categories in meat and egg production. 5. Recognize the importance and role of poultry products. 6. Compare the production of chickens, turkeys, ducks, and geese. 7. Evaluate the production of meat, table eggs, and poultry breeding stock in domestic poultry farming. 		
Assessment and evaluation of student work during classes		
The right to take the final exam is granted by accumulating a minimum number of assessment points. Assessment points are earned through class attendance (at least 70%), participation in class activities, and grades from partial exams. During the semester, students are required to take partial exams. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam is oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Austic, R.E., Nesheim, M.C. (1990): Poultry production. Philadelphia, USA, Lea and Febiger. 2. Kralik, Gordana (1991): Peradarska proizvodnja. U udžbeniku: Brinzej i sur.: Stočarstvo, Školska knjiga, Zagreb. 3. Kralik, Gordana, Has-Schoen Elizabeta, Kralik, D., Šperanda, Marcela (2008): Peradarstvo biološki i zootehnički principi. Sveučilište Josipa Jurja Strossmayera u Osijeku. 4. Leeson, S., Summers, J.D. (1997): Commercial Poultry Nutrition. Second Edition. University Books, Guelph, Canada. 5. Nemanič, J., Berić, Ž. (1995): Peradarstvo, Nakladni zavod "Globus". Zagreb. 6. Rose, S.P. (1997): Principles of Poultry Science. CAB Publishing. 		
Additional literature		
<ol style="list-style-type: none"> 1. Proceedings from international conferences: "Krmiva", "Poultry Science", "British Poultry Science, "Archiv fuer Geflueelkunde" 		

SHEEP AND GOAT BREEDING II		
Coordinator	Zvonko Antunović	
Collaborators	Josip Novoselec Željka Klir Šalavardić	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (40 L + 15 P + 20 S)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with recent breeding and selection procedures in the production of meat, milk, wool, and hair, taking into account the specific characteristics of sheep and goat farming. Additionally, the course will train participants in modern breeding and technological practices in sheep and goat husbandry.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Define the methods of breeding and inheritance in sheep and goats. Explain the breeding process of sheep and goats and describe methods for detecting estrus in these animals. 2. Define the factors influencing the productivity and quality of sheep and goat milk, meat, wool, or hair, and explain the slaughter processing and classification of sheep and goat carcasses. 3. Explain the specific nutritional requirements of different categories of sheep and goats and calculate their optimal feeding needs. Students will also be able to independently formulate balanced diets for sheep and goats of different age categories. 4. Calculate pasture load and organize its efficient use. Explain the metabolic status and housing conditions for sheep and goats. 5. Explain the selection process for sheep and goats, analyze breeding programs in sheep and goat farming, and describe ecological sheep and goat production systems. 6. Discuss, argue, and critically assess a given topic related to sheep and goat farming. 		
Assessment and evaluation of student work during classes		
The right 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%), class participation, and grades from partial exams and the seminar. During the semester, students will take three partial exams (in weeks 4, 7, and 11 of the course) and submit a seminar paper (during weeks 12-15). The final exam is mandatory, and a positive grade on both the final exam and the seminar paper is required for a positive final grade. The final exam will be oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Mioč, B. (2022): Uzgoj koza. Hrvatska mljekarska udruga. Zagreb. 2. Mioč, B., Pavić, V., Sušić, V. (2007): Ovčarstvo. Hrvatska mljekarska udruga. Zagreb. 3. Freer, M., Dove, H. (2002): Sheep Nutrition. Cabi Publishing and CSIRO Publishing. 4. Cannas, A., Pulina, G. (2008.): Dairy goats feeding and nutrition. CAB International. 5. Senčić, Đ., Antunović, Z., Mijić, P., Baban, M., Puškadija, Z. (2011): Ekološka zootehnika. Poljoprivredni fakultet u Osijeku. NRC- Nutrient requirements of small ruminants (2007): The National Academy Press. Washington DC, USA. 		
Additional literature		
<ol style="list-style-type: none"> 1. Piper, L., Ruvinsky, A. (1997): The genetics of sheep. CAB International. 2. Gordon, J. (1997): Controlled reproduction in sheep and goats. CAB International. 3. Šakić, V., Katica, V., Ferizbegović, J. (2011.): Uzgoj koza. Veterinarski fakultet Univerziteta u Sarajevu. Sarajevo. 4. Senčić, Đ., Antunović, Z., Novoselec, J., Samac, D., Prakatur, I., Bobić, T., Klir, Ž. (2021): Tehnologija stočarske proizvodnje (poglavlja: Ovčarstvo, Kozarstvo). Fakultet agrobiotehničkih znanosti Osijek. 5. Mahgoub, O., Kadim, T., Webb, E. (2012): Goat meat production and quality. CAB International. 		

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **SPECIAL ZOO - TECHNIQUE**

6. Senčić, Đ., Antunović, Z. (2003): Ekološko stočarstvo. Katava d.d. Osijek.
7. Samardžija, M., Đuričić, D., Dobranić, T., Herak, M., Vince, S (2010): Rasplodivanje ovaca i koza. Veterinarski fakultet Sveučilišta u Zagrebu.
Court, J., Webb, W.J., Hides, S. (2010): Sheep farming for meat and wool. CSIRO Publishing.

QUANTITATIVE GENETICS AND SELECTION		
Coordinator	Boris Lukić	
Collaborators	Nikola Raguž	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (45 L + 30 E)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with the concept of inheritance of quantitative traits, mathematical and statistical methods for assessing their phenotypic, genetic, and environmental variability, the concept of heritability and breeding value, and selection methods for quantitative traits based on phenotypic and genomic information.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Explain the concept of inheritance of quantitative traits. 2. Understand the concept of heritability and breeding value. 3. Identify selection methods based on the nature of the trait, population characteristics, and the breeding program plan. 4. Conduct an assessment of selection response according to various set criteria. 5. Understand the concept underlying the application of molecular markers in selection. 6. Participate in the creation of breeding and selection programs, assessing genetic parameters, and evaluating the breeding values of individuals in populations under productivity control. 		
Assessment and evaluation of student work during classes		
The right 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 will take three partial exams. The final exam is mandatory, and a positive grade on the final exam is a prerequisite for a positive final grade. The final exam will be oral.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Lukić, B. Bilješke s predavanja i vježbi 2. Raguž, N. Bilješke s s predavanja i vježbi 3. Oldenbroek Kor and van der Waaij Liesbeth. Textbook Animal Breeding and Genetics for BSc students. Centre for Genetic Resources The Netherlands and Animal Breeding and Genomics Centre, 2015. 4. Mrode R. Linear Models for the Prediction of Animal Breeding Values. CABI Publishing, 2014. 5. Jovanovac, S. Populacijska genetika domaćih životinja. Skripta. Poljoprivredni fakultet u Osijeku, 2005. 6. Jovanovac, S. Principi uzgoja životinja. Sveučilišni udžbenik, Osijek, 2013. Rimac, D. Priručnik za vježbe iz Populacijske genetike domaćih životinja, Poljoprivredni fakultet u Osijeku, 2005. 		
Additional literature		
<ol style="list-style-type: none"> 1. Falconer, D.S., Mackay, T.F. Introduction to Quantitative Genetics. Longman Group; Ltd, 1996. 2. Van Vleck, L. Dale. Selection index and introduction to mixed model methods. CRC Press. 1999. 		

ANIMAL PRODUCTS - QUALITY CONTROL		
Coordinator	Djurkin Kušec Ivona	
Collaborators	Goran Kušec	
Study year and semester	1st year, 2nd semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (35 L + 25 E + 10 S)
COURSE DESCRIPTION		
Course aims	The aim is to familiarize students with methods for ensuring quality in the production and processing of animal products, as well as the application of modern technological and molecular insights aimed at improving the quality of animal products.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successfully completing the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Explain the importance of the quality of animal products in human nutrition. 2. Explain and justify the importance of hygienic safety and overall safety of animal products. 3. Analyze and explain the genetic and environmental factors affecting the quality of animal products. 4. Apply modern technological and molecular techniques to improve the quality of animal products. 5. Participate in self-monitoring processes within production facilities and in quality control systems. 		
Assessment and evaluation of student work during classes		
Students are required to attend classes regularly and actively participate in tasks during lectures and exercise sessions. After attending the classes and exercises students must write a seminar paper on assigned topics. Following the evaluation of the seminar paper, the first partial exam will be held, after which students may proceed to the oral exam. The final grade for students will be determined based on continuous monitoring of class participation, the seminar paper, written knowledge assessments (written partial exam), and the final oral exam.		
Obligatory literature		
<ol style="list-style-type: none"> 1. Toldrá, F. (Ed.), 2022. Lawrie's meat science. 9th edition. Woodhead Publishing. 2. Fuquay, J. W., McSweeney, P. L., & Fox, P. F., 2011. Encyclopedia of dairy sciences. Academic Press. 3. Havranek Lj., Rupić V., 2003. Mlijeko, od farme do mljekare, 2003. Sveučilišni udžbenik, Hrvatska mljekarska zadruka 4. Swatland, H.J., 1994. Structure and development of meat animals, Technomic pub. Co., Lancaster, Pa. USA 5. Tratnik, Lj., 1998. Mlijeko – tehnologija, biokemija i mikrobiologija, Hrvatska mljekarska udruga Živković, J., 1986. Higijena i tehnologija mesa, II.Dio, Kakvoća i prerada. Zagreb 		
Additional literature		
<ol style="list-style-type: none"> 1. Downey, G. (Ed.), 2016. Advances in food authenticity testing. Woodhead Publishing. 2. McEntire, J., Kennedy, A. W., 2019. Food Traceability. Springer International Publishing, Cham. 3. Professional and scientific literature related to the issue of animal products 4. Legislation related to animal products (Regulations, Decrees, Laws) 		

ZOO – TECHNIQUE (University Graduate Study Programme)

Major in **SPECIAL ZOO - TECHNIQUE**

PRACTICAL WORK II		
Coordinator	Andrijana rebekić	
Collaborators		
Study year and semester	2nd year, 4th semestar	
Number of credits and mode of delivery	ECTS bodovi	6
	Broj sati (L+E+S)	75 (65 L + 150 S)
COURSE DESCRIPTION		
Course aims	Familiarization with the technological processes involved in livestock production practices and the analysis of the quality of animal-based products.	
Course enrolment requirements	No preconditions	
Intended course learning outcomes		
Upon successful completion of the module, the student will be able to:		
<ol style="list-style-type: none"> 1. Differentiate and define the phases of the production cycle in a specific livestock production system. 2. Plan and design an optimal production system in livestock farming. 3. Define the factors influencing economic efficiency in livestock production. 4. Recognize the key genetic factors that affect production success. 5. Design alternative production systems in livestock farming that align with animal welfare, health criteria, and environmental protection standards. 		
Assessment and evaluation of student work during classes		
Students are expected to continuously participate in fieldwork and must keep a work diary during practical lessons. The final grade for students will take into account continuous monitoring of attendance, class participation, and practical work.		
Obligatory literature		
Additional literature		