

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE

**DETAILED PROPOSAL OF
THE STUDY PROGRAMME
VETERINARY MEDICINE IN ENGLISH
FOR THE 2020-2021 ACADEMIC YEAR**

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GENERAL INFORMATION ABOUT UNIVERSITY OF ZAGREB

UNIVERSITY OF ZAGREB



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The University of Zagreb (Universitas Studiorum Zagrabiensis) is the biggest and the oldest university in Croatia as well as in South-East Europe. The university was founded in 1669 by King Leopold I who issued a decree granting the status and privileges of a university to the Jesuit Academy. The university now consists of 30 faculties, three art academies and the University Centre "Croatian Studies". Over 50.000 students attend study

programmes in fields of Biotechnology, Biomedicine, Social and Humanistic Sciences, Natural Sciences, Engineering and Arts. Complete information can be gotten at the University web site www.unizg.hr (Source: www.unizg.hr/homepage)

University profile at the University website Past, Present & Future - University Leadership - Vision & Mission - Basic Statistical Data - Academies & Faculties of the University of Zagreb - Organisational Units & Other Supporting Institutions

GENERAL FACTS ON FACULTY OF VETERINARY MEDICINE – ZAGREB



Source: Bregeš

Faculty of Veterinary Medicine, University of Zagreb was founded in 1919 as a four year college. On 7 December 1924 the school was renamed into the Faculty of Veterinary Medicine and it became a part of the University of Zagreb. Since then it has been the only faculty of that kind in the Republic of Croatia. The Faculty comprises a number of premises; lecture and teaching rooms, computer laboratories and laboratories and facilities where large and small animals are kept. Well equipped infrastructure provides conditions for scientific research, teaching as well as cooperation with the economic sector (agriculture, biotechnology, animal origin food production). Striving to achieve international high teaching standards the Faculty has been successfully evaluated by EAEVE (European Association for the Establishment of the Veterinary Education) since 2002. The changes appointed by the EAEVE expert team are included in the new curriculum. Study programme is aligned with the Bologna structure.

Also, all the ISO 9001 Bureau Veritas criteria concerning the quality control are met and Faculty possess its valid certificate.

Teaching, scientific and highly skilled activities of the Faculty are based on the work of departments and clinics integrated since academic year 2005/06 into four departments: Basic and Pre-clinical Sciences Division, Animal Production and Biotechnology Division, Clinical Division and Veterinary Public Health and Food Safety Division. The fifth department, Management, Chairs and Technical Services besides an office

manager and accounting, also include IT section, Central library as well as Chair of Foreign Languages and Chair of Physical Training.

Since the beginning of the academic year 2005/06 the Faculty of Veterinary Medicine of the University of Zagreb has been implementing the new curriculum entitled University study of Veterinary medicine. The study lasts for six years (12 semesters) – 360 ECTS points.

Experiences at and recommendations by a number of leading veterinary institutions of higher education in the world, particularly of the European Association of Establishments for Veterinary Education (EAEVE), were acknowledged in drafting the new curriculum. Most teaching such as lessons, seminars, practical work and other forms of consultations are performed within the Faculty tract situated in the south east Zagreb.

The premises include 12 buildings with teaching rooms, student practicum, laboratories and computer laboratories. Completely refurbished large lecture room with the most sophisticate equipment offers an opportunity for multimedia and teleconference presentations. Moreover, better working conditions have been achieved due to involment in a framework of IVSA-Croatia (International Veterinary Students Association) and Equus (Veterinary Medicine Student Association) activities by recently remade student premises.

European Association of Establishments for Veterinary Education (EAEVE)
<http://www.eaeve.org>



GENERAL INFORMATION ABOUT THE PROPOSED STUDY PROGRAM

NAME OF THE STUDY PROGRAM

**INTEGRATED UNDERGRADUATE AND GRADUATE
UNIVERSITY STUDY OF VETERINARY MEDICINE IN
ENGLISH**

PROVIDER OF THE STUDY PROGRAM

**FACULTY OF VETERINARY MEDICINE
UNIVERSITY OF ZAGREB**

TYPE OF THE STUDY PROGRAM

University study program

LEVEL OF THE STUDY PROGRAM

Integrated undergraduate and graduate study

ACADEMIC/PROFESSIONAL TITLE UPON COMPLETION OF THE STUDY

Doctor of veterinary medicine

SCIENTIFIC AREA OF THE STUDY PROGRAM

Area: Biomedicine and health, field: Veterinary medicine

DURATION OF THE STUDY PROGRAM AND MINIMUM NUMBER OF ECTS CREDITS

The study lasts 6 years or 12 semesters. For each completed year, a student earns 60 ECTS credits. Upon completion of the study, minimum of 360 ECTS credits are earned.

REASONS FOR STUDY IN ENGLISH

The fundamental reason for the promotion of organization and conduct of the study program in English lies in the need to provide a university study in veterinary medicine in English within the University of Zagreb and the Republic of Croatia. Initiation of the first university study of veterinary medicine in the English language in the Republic of Croatia occurs as response to a recognized need, and as preparation for global work environment, for the education of doctors of veterinary medicine in English. We believe that the establishment of the study in English is yet another contribution to the international recognition of the University and our Faculty and that it will prepare students for work in an open international market. Additional interest for enrolment in the study program at the Faculty of Veterinary Medicine in Zagreb comes from students from the non-EU countries and this interest rose especially after Croatia joined the EU.

The importance of starting the study program in English is also found in the regional integration with the European area of higher education (EHEA) since the Veterinary faculties in the region do not have studies in English. The realization of this set goal would position our Faculty as the leading institution of higher education in the region in the field of veterinary medicine. Establishment of the study in English in Croatia would ensure the competitiveness and distinctiveness of the program and a greater mobility of students and lecturers. The objective of the establishment of the aforementioned study is that its scientific and teaching activity primarily contributes to the development of Croatia, but also the region as a whole. The study is designed in a way that it meets the criteria of the curricula of the veterinary faculties which are carried out within the European Union and which are accredited by EAEVE.

The idea to initiate the study of veterinary medicine at the Faculty of Veterinary Medicine, Zagreb has matured for a number of years. Also, one of the reasons for starting the study in English is to encourage parallel conduct of studies in Croatian and English language in order to offer equal opportunities to local students to attend studies in Croatian and English, but also to attract foreign students from the Europe and other continents. The Faculty of Veterinary Medicine, University of Zagreb recognizes the fact that a large number of Croatian citizens and people of Croatian origin live abroad, and it therefore sees a great potential of academic involvement and launch of powerful mechanisms of international exchange and cooperation. By establishing the study in English, the Faculty of Veterinary Medicine will respond to the needs of Croatian citizens from the region and the world, who have in the last few years shown a steady interest in education at the Faculty of Veterinary Medicine in Zagreb. In addition to Croatian citizens who would like to study from the very beginning in the English language, there are a number of other interested groups.

Thus, the proposed program of study in English could be enrolled by:

1. Candidates who are BSc in natural or biomedical sciences;
2. Candidates who completed at least four years of secondary education abroad, in a country that has an *established* system of external evaluation of secondary education;
3. Candidates who passed internationally recognized SAT Reasoning Test;
4. High school graduates from the Republic of Croatia and Diaspora / international students with a high school diploma;
5. Foreign students using EU mobility program and other exchange programs (e.g. ERASMUS, CEEPUS, AUF and the like)
6. Students who wish to attend courses only in part of the academic year or who would like to attend an elective course.

Today, the Faculty is a public institution of higher education which, as a constituent part of the University of Zagreb (hereinafter: the University), organizes and implements university and vocational studies and develops scientific and professional work in the educational and scientific field of biomedicine and health care, the field of veterinary medicine. The Faculty is a legal entity entered into the Register of Higher Education Institutions and the Register of Scientific Research Legal Entities, kept by the Ministry of Science, Education and Sports of the Republic of Croatia. The current program of study is the fundamental in education in the field of veterinary medicine. We have formed the new program of study in English as a faithful copy of the program in the Croatian language. The number of core and elective courses and three study tracks are completely identical in both study programs.

The diploma is equivalent to the diploma received by students who complete the current Croatian degree program. The program in English has clearly expressed learning outcomes and described qualifications that are stated in the Diploma Supplement (DS).

The program is designed as a combination of basic courses, preclinical and clinical veterinary subjects, which provide a broad education to every doctor of veterinary medicine. During lectures, seminars/tutorials and practicals, students receive the necessary skills and techniques related to the selected studies in English, especially during seminars and practicals in which they acquire practical knowledge directly with the help of university teachers and prominent experts in veterinary practice. In order to easily master the work techniques and get quickly involved in the business practice and professional performance of tasks for which they have been preparing during the study, attention has been given to mandatory practical training of participants during the two final years of the study, which is carried out in appropriate facilities and institutions. This allows employers to meet potential employees while students can have easier insight into their own knowledge, skills and the actual preparation for entry into the world of modern veterinary practice. Upon enrolment in the fifth year of study, students have the option to choose between one of the three study tracks:

1. Small Companion Animals (SCA)
2. Farm Animals and Horses (FAH)
3. Veterinary Public Health (VPH)

The course content in the existing three study tracks within the study program covers numerous current gains and follows developmental dynamics that are distributed in the framework of various academic sub-disciplines. They are designed to encourage the real interest of students for one of the selected fields of veterinary profession as well as their creativity. The selected study track provides them with essential theoretical knowledge and all the essential practical applications and skills in each of the selected segments of veterinary activity, as well as activities that are associated with it. Particular emphasis is placed on building students' competencies through teamwork in small groups. Students thus actively learn how to solve problems, gain experience in team work and conduct of business.

Clinical teaching for all the assigned students starts from the 3rd year of study. Practical training in food hygiene and public health is ensured in slaughterhouses, markets, meat processing factories, dairies as well as laboratories. Laboratory skills, as well as principles of work safety in laboratories are taught from the first year onwards.

Continuous modernization of working and teaching spaces, laboratories and clinics resulted in an increased interest of foreign students, participants in postgraduate specialist studies and in the owners' selection of the Faculty as the location for the treatment of their companion animals and farm animals. The Faculty has so far become well-defined as a regionally recognizable institution in the field of education and professional-clinical work.

The current program of study which is now conducted in Croatian, received Accreditation for the conduct at the Faculty of Veterinary Medicine by the Ministry of Science, Education and Sports of the Republic of Croatia based on the prior positive opinion of the National Council for Higher Education.

Upon completion of the study at least 360 ECTS credits are earned. The study is conducted at the seat of the higher education institution in Vjekoslava Heinzela Street 55, 10 000 Zagreb. Academic degree is stated as: doctor of veterinary medicine. The occupation doctor of veterinary medicine in the Republic of Croatia belongs to the group of regulated professions, therefore the study program is largely harmonized with the provisions of Directive 2005/36/ EC, as well as the Law on regulated professions and recognition of foreign professional qualifications (OG124/09). Pursuant to the above mentioned, the Faculty determined that the study shall be carried out as integrated study, in one educational cycle of six years.

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Prof. Ivana Tlak Gajger, Vice Dean for Financial Operations and Investments

Prof. Ljubo Barbić, Vice Dean for Human Resources, Organization and Management

Assoc. Prof. Dean Konjević, Vice Dean for Research, Postgraduate Studies and Lifelong Learning

Prof. Juraj Grizelj, Vice Dean for International Cooperation and Veterinary Studies in English

Assoc. Prof. Danijela Horvatek Tomić, Vice Dean for Quality Assurance

COURSE CATALOGUE – OBLIGATORY AND ELECTIVE COURSE LIST

2020/2021 COURSE CATALOGUE – OBLIGATORY AND ELECTIVE COURSE LIST (L-lecture, S-seminar, P-practical, F-fieldwork)

1st year

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
I semester						
Obligatory Subject	Physics and Biophysics	16	0	38	0	5
	Medical Chemistry	18	0	36	0	5
	Zoology	15	20	30	10	5,5
	Botany in Veterinary Medicine	10	0	10	0	1,5
	Anatomy with Organogenesis of Domestic Animals I	18	0	64	0	7,0
	Basic Statistics in Veterinary Medicine	14	0	16	0	2,5
	Introduction to Veterinary	2	6	0	12	1,5
	Environment, Animal Behaviour and Welfare	8	8	24	0	3,0
	Physical Education	0	0	30	0	1
	Total hours of obligatory courses:		101	34	218+30	22

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
II semester						
Obligatory Subject	Anatomy with Organogenesis of Domestic Animals II.	20	0	100	0	8,0
	Biochemistry in Veterinary Medicine	30	12	30	0	7,5
	Histology with General Embryology	30	0	60	0	7
	Animal Breeds Characteristics	14	10	30	6	4,5
	Introduction to English Veterinary Medical Terminology I	0	5	10	0	1
	Physical Education	0	0	30	0	1
	Total hours of obligatory courses:		94	27	230+30	6
Elective Subject 2 ECTS (MIN 2, MAX 4 ECTS)	Chemistry of Natural Compounds	15	9	6	0	2
	Positive Impact of Animals on Human Health	5	5	5	0	1
	Conservation and Management of Endangered Species	0	0	15	0	1
	English for Academic purposes I	5	40	15	0	4
	Selected Chapters in Biomedical Physics for Veterinarians	20	10	0	0	2
	Veterinary Ethics	15	15	0	0	2
	Fundamentals of Scientific Research	8	4	18	0	2
	Specific Anatomical Structures of the Locomotor Apparatus of the Horse	0	0	15	0	1

2nd year

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
III semester						
Obligatory Subject	Physiology of Domestic Animals I	30	0	50	0	6
	Molecular Biology and Genomics in Veterinary Medicine	5	10	30	0	3,5
	Basic Animal Nutrition	15	0	24	6	3,5
	Introduction to English Veterinary Medical Terminology II	0	5	10	0	1,0
	Anatomy with Organogenesis of Domestic Animals III	15	0	63	0	5,5
	Animal Breeding and Production	20	8	16	0	3,5
	Hygiene and Housing of Animals	16	0	24	0	3,0
	Veterinary Immunology	15	0	15	0	2,5
	Physical Education	0	0	30	0	1
	Total hours of obligatory courses:	116	23	232+30	6	29,5
Elective Subject 2 ECTS	Reptile Morphology	4	15	11	0	2
	English for Academic purposes II	5	40	15	0	4
(MIN 2, MAX 4)	Comparative Anatomy of Skeletal System	10	0	20	0	2
	Structure and Function of Cell	10	7	8	0	2
	Biology and Ecology of Predators	8	4	18	0	2
	Fundamentals of Agronomy	12	11	7	0	2,5

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
IV semester						
Obligatory Subject	Physiology of Domestic Animals II	45	25	60	0	10
	Applied Animal Nutrition	25	0	20	30	5,5
	Animal Breeding and Production	14	6	14	12	3,5
	Hygiene and Housing of Animals	13	22	0	20	3,0
	General Microbiology	12	12	30	0	3,5
	Physical Education	0	0	30	0	1
		Total hours of obligatory courses:	109	65	124+30	62
4 ECTS (MIN 4, MAX 6 ECTS)	Game Zoology	5	0	25	0	2
	Anatomy of Laboratory Animals	6	0	24	0	2
	Archaeozoology	10	5	15	0	2
	Cytometry in Clinical Veterinary Medicine	0	15	15	0	2
	Fundamentals of Ecologic Livestock Breeding	10	5	15	0	2
	Physiology of Birds	12	0	3	0	1
	Physiology of Amphibians and Reptiles	10	0	5	0	1
	Biology and Conservation of Marine Mammals	10	14	16	0	2,5

3rd year

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
V semester						
Obligatory Subject	Parasitology and Parasitic Diseases	34	0	56	0	7,0
	General Veterinary Pathology	30	0	60	0	7,0
	Pathophysiology I	12	4	9	0	2,5
	Special Microbiology	15	15	30	0	4,5
	Pharmacology	45	5	35	0	6,5
	Radiation Hygiene	10	0	20	0	2,5
	Total hours of obligatory courses:	146	24	210	0	30

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
VI semester						
Obligatory Subject	Special Veterinary Pathology	60	0	75	0	10,5
	Pathophysiology II	39	6	50	0	6,5
	Clinical Propedeutics	45	0	60	0	8,0
	Communication Skills in Veterinary Medicine	16	0	12	0	1,0
	Total hours of obligatory courses:	160	6	197	0	26
Elective Subject MIN 5, MAX 6 ECTS	Fundamentals of Physics for Diagnostics Methods	20	10	0	0	2
	Comparative Mucosal Immunology	15	5	10	0	2
	Veterinary Clinical Microbiology	8	0	22	0	2
	Parasitic Zoonotic Diseases	10	20	0	0	2
	Feed Additives - Health Modulators	3	2	10	0	1
	Pigeon Keeping and Breeding	0	15	15	0	2
	Breeding and Husbandry of Rabbits and Furbearers	3	25	2	0	2
	The Role of Veterinarians at Organic Farms	12	18	0	0	2
Agricultural Economics and Rural Development	10	0	20	0	2	

4th year

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
VII semester						
Obligatory Subject	Internal Medicine	90	0	115+5*	0	16,0
	Surgery, Orthopaedics and Ophthalmology I	30	0	60	0	7,0
	General and Clinical Radiology	15	0	30	0	3,5
	Game Breeding and Management	4	0	18	8	2,5
	Total hours of obligatory courses:	139	0	228	8	29

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
VIII semester						
Obligatory Subject	Surgery, Orthopaedics and Ophthalmology II	30	0	40+5*	0	5,5
	Obstetrics and Reproduction I	60	0	100+5*	0	12,5
	Methods of Physical Therapy and Diagnostics	15	0	15	0	2,5
	Biology and Pathology of Beneficial Insects	11	0	16	9	2,5
	Biology and Pathology of Aquatic Organisms	11	0	20	5	2,5
	Toxicology	24	6	22	2	3,5
	Total hours of obligatory courses:	151	6	213+10*	16	29
Elective Subject MIN 2, MAX 4 ECTS	Clinical Physiology	15	0	15	0	2
	Hunting and Nature Protection	4	0	26	0	2
	Veterinary Nuclear Medicine	12	0	3	0	1
	Comparative Nutrition	5	6	4	0	1
	Cynology and Felinology	10	20	0	0	2

*Clinic night shift hours

5th year

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
IX semester						
Obligatory Subject	Surgery, Orthopaedics and Ophthalmology III	30	0	45	0	5,5
	Obstetrics and Reproduction II	30	0	45	0	5,5
	Food Hygiene and Technology	30	0	32	28	7
	Infectious Diseases of Domestic Animals	25	0	75	0	6
	Veterinary Epidemiology	4	0	26	0	2,5
	Total hours of obligatory courses:	119	0	223	28	26.5
Elective Subject MIN 4, MAX 6 ECTS	Veterinary Clinical Pathology	14	8	8	0	2
	Comparative Odontology	10	0	5	0	1
	Fish Morphology	0	10	20	0	2
	Fundamentals of the Tumor Molecular Pathology and Histology	10	0	20	0	2
	Wildlife Diseases	4	0	26	0	2

X – SEMESTER - Study Track - Small Companion Animals (SCA)

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
X semester – STUDY TRACK Small Companion Animals (SCA)						
Obligatory Subject	State Veterinary Medicine	15	30	0	0	3,5
	Infectious Diseases of Domestic Animals	50	0	30	0	7,5
	Food Hygiene and Technology	30	0	25	20	5,5
	Field Service Clinics	0	0	60	0	3,5
	Diseases and Treatment of Dogs and Cats I	0	0	45	0	3,5
	Total hours of obligatory courses:	95	30	160	20	23.5
Elective* Subject MIN 7, MAX 10 ECTS	Animal Dietetics	5	5	20	0	2
	Diseases of Honeybees in Contemporary Production	6	2	2	5	1
	Fishery	3	4	0	8	1

* Students must enrol in courses providing at least 2 ECTS points from the 10th semester elective course list, and elective courses offered in previous semesters for the remaining ECTS points. The number of students enrolled in some elective courses may be limited by the curriculum.

X – SEMESTER - Study Track - Veterinary Public Health (VPH)

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
X semester – STUDY TRACK Veterinary Public Health (VPH)						
Obligatory Subject	State Veterinary Medicine	15	30	0	0	3,5
	Infectious Diseases of Domestic Animals	50	0	30	0	7,5
	Food Hygiene and Technology	30	0	25	20	5,5
	Field Service Clinics	0	0	60	0	3,5
	Food Hygiene and Quality Control	11	4	24	6	3,5
	Veterinary Legislation and Food Safety Control	28	17	0	0	3,5
	Total hours of obligatory courses:	134	51	139	26	27
Elective Subject MIN 3, MAX 6 ECTS	Autochthonous Meat Products	5	15	6	0	2
	Autochthonous Dairy Products	6	13	5	6	2
	Hygienic Quality of Game Meat	11	10	5	0	2
	Hygiene and Quality of Poultry Meat	4	8	14	0	2
	Carcass Quality at the Slaughter Line	8	10	8	0	2
	Hygiene and Quality of Fish Meat	9	12	6	0	2
	Diseases of Honeybees in Contemporary Production	6	2	2	5	1
	Fishery	3	4	0	8	1

X – SEMESTER - Study Track - Farm Animals and Horses (FAH)

	Subject	COURSE DISTRIBUTION				ECTS
		L	S	P	F	
X semester – STUDY TRACK Farm Animals and Horses (FAH)						
Obligatory Subject	State Veterinary Medicine	15	30	0	0	3,5
	Infectious Diseases of Domestic Animals	50	0	30	0	7,5
	Food Hygiene and Technology	30	0	25	20	5,5
	Field Service Clinics	0	0	60	0	3,5
	Equine Medicine	9	36	45	0	7
	Total hours of obligatory courses:	119	0	223	28	27
Elective Subject MIN 3, MAX 6 ECTS	Animal Dietetics	5	5	20	0	2
	Diseases of Honeybees in Contemporary Production	6	2	2	5	1
	Fishery	3	4	0	8	1
	Sport and Working Animals	8	4+2	16	0	2

REGISTRATION AND EXAMINATION REQUIREMENTS SCHEME

I SEMESTER

SUBJECT	Registration requirements for partial-year enrollees	Examination requirements for full-year and partial-year enrollees
PHYSICS AND BIOPHYSICS	-	
MEDICAL CHEMISTRY	-	
ZOOLOGY	-	
BOTANY IN VETERINARY MEDICINE	-	
ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I	-	
ENVIRONMENT, ANIMAL BEHAVIOUR AND WELFARE	-	
BASIC STATISTICS IN VETERINARY MEDICINE	-	
INTRODUCTION TO VETERINARY	-	
PHYSICAL EDUCATION	-	

II SEMESTER

SUBJECT	Registration requirements for partial-year enrollees	Examination requirements for full-year and partial-year enrollees
ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II	-	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I must be completed
BIOCHEMISTRY IN VETERINARY MEDICINE	Pending completion of the course MEDICAL CHEMISTRY*	MEDICAL CHEMISTRY must be completed
HISTOLOGY WITH GENERAL EMBRYOLOGY	-	
ANIMAL BREEDS CHARACTERISTICS	-	
INTRODUCTION TO ENGLISH VETERINARY MEDICAL TERMINOLOGY I.	-	
PHYSICAL EDUCATION	-	

*All classes attended, but final exam(s) yet to be taken

III SEMESTER

SUBJECT	Registration requirements for partial-year enrollees	Examination requirements for full-year and partial-year enrollees
PHYSIOLOGY OF DOMESTIC ANIMALS I	MEDICAL CHEMISTRY must be completed	PHYSICS IN BIOPHYSICS, BIOCHEMISTRY IN VETERINARY MEDICINE, ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II, HISTOLOGY WITH GENERAL EMBRYOLOGY must be completed
MOLECULAR BIOLOGY AND GENOMICS IN VETERINARY MEDICINE	BOTANY IN VETERINARY MEDICINE, MEDICAL CHEMISTRY, BIOCHEMISTRY IN VETERINARY MEDICINE and ZOOLOGY must be completed	BOTANY IN VETERINARY MEDICINE, MEDICAL CHEMISTRY, and BIOCHEMISTRY IN VETERINARY MEDICINE and ZOOLOGY must be completed.
BASIC ANIMAL NUTRITION	MEDICAL CHEMISTRY must be completed.	MEDICAL CHEMISTRY must be completed.
ANIMAL BREEDING AND PRODUCTION	Pending completion of BASIC STATISTICS IN VETERINARY MEDICINE and ANIMAL BREEDS CHARACTERISTICS	
HYGIENE AND HOUSING OF ANIMALS	-	
VETERINARY IMMUNOLOGY	-	
ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III	-	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I and ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II must be completed.
INTRODUCTION TO ENGLISH VETERINARY MEDICAL TERMINOLOGY II	-	INTRODUCTION TO ENGLISH VETERINARY MEDICAL TERMINOLOGY I must be completed.

IV SEMESTER

SUBJECT	Registration requirements for partial-year enrollees	Examination requirements for full-year and partial-year enrollees
PHYSIOLOGY OF DOMESTIC ANIMALS II	Pending completion of PHYSIOLOGY OF DOMESTIC ANIMALS I*	PHYSIOLOGY OF DOMESTIC ANIMALS I must be completed.
APPLIED ANIMAL NUTRITION	Pending completion of BASIC ANIMAL NUTRITION*. BIOCHEMISTRY IN VETERINARY MEDICINE must be completed	BASIC ANIMAL NUTRITION and BIOCHEMISTRY IN VETERINARY MEDICINE must be completed.

ANIMAL BREEDING AND PRODUCTION	Pending completion of the course ANIMAL BREEDING AND PRODUCTION from the 3rd semester*	ANIMAL BREEDS CHARACTERISTICS and BASIC STATISTICS IN VETERINARY MEDICINE must be completed.
HYGIENE AND HOUSING OF ANIMALS	Pending completion of HYGIENE AND HOUSING OF ANIMALS from the 3rd semester*	ENVIRONMENT, ANIMAL BEHAVIOUR AND WELFARE must be completed.
GENERAL MICROBIOLOGY	Pending completion of the course VETERINARY IMMUNOLOGY*	

*All classes attended, but final exam(s) yet to be taken

V SEMESTER

SUBJECT	Registration requirements for partial-year enrollees	Examination requirements for full-year and partial-year enrollees
PARASITOLOGY AND PARASITIC DISEASES	PHYSIOLOGY OF DOMESTIC ANIMALS I., PHYSIOLOGY OF DOMESTIC ANIMALS II., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II, ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III and HISTOLOGY WITH GENERAL EMBRYOLOGY must be completed.	All compulsory courses from 1 st – 4 th semester must be completed.
GENERAL VETERINARY PATHOLOGY	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III., HISTOLOGY WITH GENERAL EMBRYOLOGY, PHYSIOLOGY OF DOMESTIC ANIMALS I., and PHYSIOLOGY OF DOMESTIC ANIMALS II must be completed.	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III., HISTOLOGY WITH GENERAL EMBRYOLOGY, PHYSIOLOGY OF DOMESTIC ANIMALS I., and PHYSIOLOGY OF DOMESTIC ANIMALS II must be completed.
RADIATION HYGIENE	PHYSICS AND BIOPHYSICS and PHYSIOLOGY OF DOMESTIC ANIMALS I must be completed.	PHYSICS AND BIOPHYSICS and PHYSIOLOGY OF DOMESTIC ANIMALS I must be completed.
PATHOPHYSIOLOGY I	All first year courses must be completed and pending completion of the courses PHYSIOLOGY OF DOMESTIC ANIMALS I and PHYSIOLOGY OF DOMESTIC ANIMALS II*	PHYSIOLOGY OF DOMESTIC ANIMALS I and PHYSIOLOGY OF DOMESTIC ANIMALS II must be completed.
PHARMACOLOGY	All first year courses must be completed and pending completion of the courses PHYSIOLOGY OF DOMESTIC ANIMALS I. and PHYSIOLOGY OF DOMESTIC ANIMALS II.*	PHYSIOLOGY OF DOMESTIC ANIMALS I. and PHYSIOLOGY OF DOMESTIC ANIMALS II must be completed.
SPECIAL MICROBIOLOGY	VETERINARY IMMUNOLOGY and GENERAL MICROBIOLOGY must be completed.	VETERINARY IMMUNOLOGY and GENERAL MICROBIOLOGY must be completed.

***All classes attended, but final exam(s) yet to be taken**

VI SEMESTER

SUBJECT	Registration requirements for partial-year enrolees	Examination requirements for full-year and partial-year enrolees
SPECIAL VETERINARY PATHOLOGY	Pending completion of GENERAL VETERINARY PATHOLOGY and passed midterms*	GENERAL VETERINARY PATHOLOGY must be completed.
PATHOPHYSIOLOGY II	Pending completion of the course PATHOPHYSIOLOGY I*	PATHOPHYSIOLOGY I must be completed.
CLINICAL PROPEDEUTICS	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III., and HISTOLOGY WITH GENERAL EMBRYOLOGY must be completed.	ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III., and HISTOLOGY WITH GENERAL EMBRYOLOGY must be completed.

***All classes attended, but final exam(s) yet to be taken**

VII SEMESTER

SUBJECT	Registration requirements for partial-year enrolees	Examination requirements for full-year and partial-year enrolees
INTERNAL MEDICINE	Pending completion of CLINICAL PROPEDEUTICS.* SPECIAL VETERINARY PATHOLOGY must be completed.	SPECIAL VETERINARY PATHOLOGY and CLINICAL PROPEDEUTICS must be completed.
SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY I.	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.
GENERAL AND CLINICAL RADIOLOGY	Pending completion of the course CLINICAL PROPAEDEUTIC, GENERAL VETERINARY PATHOLOGY and SPECIAL VETERINARY PATHOLOGY*.	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.
GAME BREEDING AND MANAGEMENT	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.

***All classes attended, but final exam(s) yet to be taken**

VIII SEMESTER

SUBJECT	Registration requirements for partial-year enrolees	Examination requirements for full-year and partial-year enrolees
SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY II	Pending completion of the course SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY I from the 7th semester.*	SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY I must be completed.
OBSTETRICS AND REPRODUCTION I	SPECIAL VETERINARY PATHOLOGY and CLINICAL PROPAEDEUTIC must be completed.	SPECIAL VETERINARY PATHOLOGY and CLINICAL PROPAEDEUTIC must be completed.
BIOLOGY AND PATHOLOGY OF BENEFICIAL INSECTS	GENERAL VETERINARY PATHOLOGY, PHARMACOLOGY, SPECIAL MICROBIOLOGY must be completed.	GENERAL VETERINARY PATHOLOGY, PHARMACOLOGY, SPECIAL MICROBIOLOGY must be completed.
BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS	GENERAL VETERINARY PATHOLOGY, PHARMACOLOGY, SPECIAL MICROBIOLOGY must be completed.	GENERAL VETERINARY PATHOLOGY, PHARMACOLOGY, SPECIAL MICROBIOLOGY must be completed.
TOXICOLOGY	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY, PATHOPHYSIOLOGY I, PATHOPHYSIOLOGY II, PHARMACOLOGY must be completed.	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY, PATHOPHYSIOLOGY I, PATHOPHYSIOLOGY II, PHARMACOLOGY must be completed.
METHODS OF PHYSICAL THERAPY AND DIAGNOSTICS	Pending completion of the course GENERAL AND CLINICAL RADIOLOGY, GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY.*	GENERAL VETERINARY PATHOLOGY, SPECIAL VETERINARY PATHOLOGY must be completed.

*All classes attended, but final exam(s) yet to be taken

IX SEMESTER

SUBJECT	Registration requirements for partial-year enrolees	Examination requirements for full-year and partial-year enrolees
INFECTIOUS DISEASES OF DOMESTIC ANIMALS	All courses from years 1 to 3 must be completed, with attendance of the 4th year courses.	-
SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY III	Pending completion of the course SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY II in the 8 th semester.*	SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY II must be completed.
OBSTETRICS AND REPRODUCTION II	Pending completion of the course OBSTETRICS AND REPRODUCTION I in the 8 th semester.*	OBSTETRICS AND REPRODUCTION I must be completed.
FOOD HYGIENE AND TECHNOLOGY	All courses from years 1 to 3 must be completed, with attendance of the 4th year courses and examinations passed in the following subjects: INTERNAL MEDICINE (7th semester) AND GAME BREEDING AND MANAGEMENT (7th semester)	-

VETERINARY EPIDEMIOLOGY	-	-
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*All classes attended, but final exam(s) yet to be taken

X SEMESTER

SUBJECT	Registration requirements for partial-year enrolees	Examination requirements for full-year and partial-year enrolees
INFECTIOUS DISEASES OF DOMESTIC ANIMALS	Pending completion of the course INFECTIOUS DISEASES OF DOMESTIC ANIMALS in the 9 th semester	INTERNAL MEDICINE must be completed.
STATE VETERINARY MEDICINE	Pending completion of the course INFECTIOUS DISEASES OF DOMESTIC ANIMALS in the 9 th semester	All courses in which students have enrolled must be completed.
FOOD HYGIENE AND TECHNOLOGY	Pending completion of the course FOOD HYGIENE AND TECHNOLOGY in the 9 th semester	All courses in years 1-4 must be completed.
FIELD SERVICE CLINICS	All subjects in 1st to 9th semester must have been attended, and the examinations passed in the following subjects: OBSTETRICS AND REPRODUCTION I and SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY II	-

**REGISTRATION AND EXAMINATION REQUIREMENTS FOR STUDY TRACK
RELATED ELECTIVE COURSES AND ELECTIVE COURSES**

SUBJECT	Registration requirements	Examination requirements
ARCHAEOZOOLOGY	<p>ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II must be completed.</p> <p>Pending completion of ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III.</p> <p>Priority will be given to students who have passed their pre-qualification exams with a grade of very good or excellent when enrolling into a course.</p> <p>Maximum number of students: 20</p>	<p>ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II must be completed.</p>
AUTOCHTHONOUS DAIRY PRODUCTS	Enrolled in the Veterinary Public Health Study Track	Pending completion of FOOD HYGIENE AND TECHNOLOGY
BIOLOGY AND CONSERVATION OF MARINE MAMMALS	Maximum number of students: 30	
CARCASS QUALITY AT THE SLAUGHTER LINE	Enrolled in the Veterinary Public Health Study Track	Pending completion of FOOD HYGIENE AND TECHNOLOGY
COMPARATIVE ANATOMY OF SKELETAL SYSTEM	<p>ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II must be completed.</p> <p>Maximum number of students: 20</p>	<p>ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I., ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II must be completed.</p>
DISEASES OF HONEYBEES IN CONTEMPORARY PRODUCTION	<p>BIOLOGY AND PATHOLOGY OF BENEFICIAL INSECTS must be completed.</p> <p>Maximum number of students: 25</p>	BIOLOGY AND PATHOLOGY OF BENEFICIAL INSECTS must be completed.
DISEASES AND TREATMENT OF DOGS AND CATS I	Internal Medicine, Surgery, Orthopaedics and Ophthalmology II, General and Clinical Radiology, Toxicology, Obstetrics and Reproduction I must be completed.	SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY III must be completed.
FISH MORPHOLOGY	<p>Pending completion of the course BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS.</p> <p>Maximum number of students: 36</p>	BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS must be completed.
FISHERY	<p>BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS must be completed.</p> <p>Maximum number of students: 20</p>	BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS must be completed.
FOOD HYGIENE AND QUALITY CONTROL	All courses in years 1 to 3 must be completed, and all 4th year courses attended	FOOD HYGIENE AND TECHNOLOGY must be completed.

FUNDAMENTALS OF AGRONOMY	ENVIRONMENT, ANIMAL BEHAVIOUR AND WELFARE must be completed with a minimal grade of very good (4). Maximum number of students: 3	
HYGIENE AND QUALITY OF FISH MEAT	Enrolled in the Veterinary Public Health Study Track	Pending completion of FOOD HYGIENE AND TECHNOLOGY
HYGIENE AND QUALITY OF POULTRY MEAT	Enrolled in the Veterinary Public Health Study Track	Pending completion of FOOD HYGIENE AND TECHNOLOGY
PARASITIC ZONOTIC DISEASES	Examination requirements: all courses in years 1 to 4 must be completed; fulfilled criteria for signature in the gradebook and completed progress tests. Maximum number of students: 30	PARASITOLOGY AND PARASITIC DISEASES must be completed.
REPTILE MORPHOLOGY	Pending completion of the course ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I, ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II and HISTOLOGY WITH GENERAL EMBRYOLOGY.	
PIGEON KEEPING AND BREEDING	ENVIRONMENT, ANIMAL BEHAVIOUR AND WELFARE AND HYGIENE AND HOUSING OF ANIMALS must be completed with an average grade which is higher than 3.5 in the above mentioned subjects. Maximum number of students :3	
SPECIFIC ANATOMICAL STRUCTURES OF THE LOCOMOTOR APPARATUS OF THE HORSE	Pending completion of the course ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I Maximum number of students: 20	
VETERINARY CLINICAL MICROBIOLOGY	GENERAL MICROBIOLOGY, SPECIAL MICROBIOLOGY and VETERINARY IMMUNOLOGY must be completed with an average grade which is higher than 3.5 in the above mentioned subjects. Maximum number of students: 10	GENERAL MICROBIOLOGY, SPECIAL MICROBIOLOGY and VETERINARY IMMUNOLOGY must be completed.
VETERINARY LEGISLATION AND FOOD SAFETY CONTROL	All courses in years 1 to 3 must be completed, and all 4th year courses attended	FOOD HYGIENE AND TECHNOLOGY must be completed.
VETERINARY CLINICAL PATHOLOGY	INTERNAL MEDICINE must be completed.	INTERNAL MEDICINE must be completed.

***All classes attended, but final exam(s) yet to be taken**

LIST OF OBLIGATORY SUBJECTS - 1st STUDY YEAR

Obligatory Subjects - 1st study year

Anatomy with Organogenesis of Domestic Animals I

Anatomy with Organogenesis of Domestic Animals II

Animal Breeds' Characteristics

Basic Statistics in Veterinary Medicine

Biochemistry in Veterinary Medicine

Botany in Veterinary Medicine

Environment, Animal Behaviour and Welfare

Histology with General Embryology

Introduction to English Veterinary Medical Terminology I

Introduction to Veterinary

Medical Chemistry

Physical Education

Physics and Biophysics

Zoology

ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS I

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Martina Đuras	1.6. Year of the study programme	1 st year, 1 st semester
1.2. Name of the course	Anatomy with organogenesis of domestic animals I	1.7. Credits (ECTS)	7
1.3. Associate teachers	Prof. Srebrenka Nejedli; Prof. Tajana Trbojević Vukičević; Assist. Prof. Mirela Pavić; Assist. Denis Leiner, DVM; Assist. Kim Korpes, DVM; Assist. Magdalena Kolenc, DVM; Assist. Nikolina Škvorc, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	18 L + 64 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	VEF-LMS
2. COURSE DESCRIPTION			
2.1. Course objectives	The course presents the gross anatomy of domestic animals with embryonic development of organs and organic systems to veterinary medicine students in order to ensure basic knowledge for other disciplines such as physiology, pathology and clinical courses.		
2.2. Course enrolment requirements and entry competences required for the course	The course is taught to first-year veterinary medicine students during the first semester. Non enrolment requirements or entry competences are required.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Following successful completion of the course, students will be able to apply acquired knowledge on gross anatomy and development of the thoracic and pelvic limbs of domestic mammals during preclinical and clinical courses.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following successful completion of the course, students will be able to: <ol style="list-style-type: none"> 1. list and describe major anatomical structures of the thoracic and pelvic limbs of domestic mammals 2. explain the development of the thoracic and pelvic limb structures 3. apply anatomical nomenclature 4. skilled communicate anatomical information 5. utilize dissection skills 		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures: 1. Introduction and anatomical nomenclature (1 hour), 2. General anatomy of the locomotor apparatus and basic angiology (1 hour), 3. General anatomy of the nervous system (1 hour), 4. Basic arthrology (2 hours), 5. Skeleton and joints of the thoracic limb (2 hours), 6. Development of the muscular tissue (1 hour), 7. Extrinsic musculature of the thoracic limb (1 hour), 8. Intrinsic musculature of the thoracic limb (1 hour). 9. Blood vessels, nerves and lymph nodes of the thoracic limb (1 hour), 10. Skeleton and joints of the pelvic limb (1 hour), 11. Extrinsic and intrinsic musculature of the pelvic limb (2 hours), 12. Blood vessels, nerves and lymph nodes of the pelvic limb (1 hour), 13. Distal digital organ (2 hours)</p> <p>Practicals: 1. Directional terms and planes of the animal body (1 hour), 2. Skeleton of the thoracic limb (10 hours), 3. Regions and fasciae of the thoracic limb (1 hour), 4. Girdle muscles of the thoracic limb (4 hours), 5. Muscles of the shoulder joint (3 hours), 6. Muscles of the elbow joint (2 hours), 7. Axilla (3 hours), 8. Muscles of the radioulnar joints, carpal joint and joints of the digits (3 hours), 9. Blood vessels, nerves and lymph nodes of the thoracic limb (3 hours), 10. Joints of the thoracic limb (3 hours), 11. Skeleton of the pelvic limb (8 hours), 12. Regions and fasciae of the pelvic limb (1 hour), 13. Girdle muscles of the pelvic limb (3 hours), 14. Muscles of the hip joint (4 hours), 15. Muscles of the stifle joint (2 hours), 16. Muscles of the tarsal joint and joints of the digits (5 hours), 17. Joints of the pelvic limb (3 hours), 18. Blood vessels, nerves and lymph nodes of the pelvic limb (3 hours), 19. Distal digital organ (2 hours)</p>					
2.6. Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Students are expected to attend lectures and dissection exercises and prepare cadavers according to course instructions.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1.26	Research		Practical training	0.7
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	2.24	Oral exam	2.8		
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimum number of points		Maximum number of points	
	Lecture attendance		3		6	
	Practical training attendance		8		12	
	Active participation in the practical training		5		10	
	Tests		20		32	
	Oral exam		24		40	
	Total		60		100	

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	KÖNIG, H. E., H.-G. LIEBICH (2007): Veterinary anatomy of domestic mammals, Textbook and color atlas. 3 rd Ed. Schattauer, Stuttgart, New York		
	DYCE, K. M., W. O. SACK, C. J. G. WENSING (2010): Textbook of veterinary anatomy. 4 th Ed. Saunders Elsevier, Philadelphia.		
	DONE, S. H., P. C. GOODY, S. A. EVANS, N. C. STICKLAND (2009): Color atlas of veterinary anatomy. Volume 3. The dog and cat. 2nd Ed. Mosby Elsevier, Edinburgh, London, New York.	1	
	EVANS, H. E., A. de LAHUNTA (2010): Guide to the dissection of the dog. 7 th Ed. Saunders Elsevier. Philadelphia.	4	
	McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary embryology. Blackwell Publishing, Dublin.		
2.12. Optional literature (at the time of submission of study programme proposal)	<p>NICKEL, R., A. SCHUMMER, E. SEIFERLE (1986): The locomotor system of the domestic mammals. Volume I. Verlag Paul Parey, Berlin, Hamburg.</p> <p>NICKEL, R., A. SCHUMMER, E. SEIFERLE (1981): The circulatory system, the skin, and the cutaneous organs of the domestic mammals. Volume III. Verlag Paul Parey, Berlin, Hamburg.</p> <p>EVANS H. E., A. De LAHUNTA (2012): Miller's anatomy of the dog. 4th Ed. WB Saunders Company, Philadelphia, London.</p> <p>SCHALLER, O. (2007): Illustrated veterinary anatomical nomenclature. 2nd Ed. Ferdinand Enke Verlag, Stuttgart.</p> <p>HYTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of domestic animal embryology. Saunders Elsevier, Philadelphia.</p> <p>SADLER, T. W. (2006): Langman's medical embryology, Lippincott Williams & Wilkins a Wolters Kluwer business. 10th Ed. Philadelphia, Baltimore, New York.</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading of active participation in the practical training, two written tests, final oral exam		
2.14. Other (as the proposer wishes to add)			

ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS II

1. GENERAL INFORMATION			
1.1 Course teacher	Assoc. Prof. Martina Đuras	1.6. Year of the study programme	1 st year, 2 nd semester
1.2.Name of the course	Anatomy with organogenesis of domestic animals II	1.7. Credits (ECTS)	8
1.3. Associate teachers	Full Prof. Tajana Trbojević Vukičević; Assist. Mirela Pavić, PhD, DVM; Assist. Denis Leiner, DVM, Assist. Kim Korpes, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	20 + 100 E
1.4.Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5.Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	VEF-LMS
2. COURSE DESCRIPTION			
2.1.Course objectives	The course presents the gross anatomy of domestic animals with embryonic development of organs and organic systems to veterinary medicine students in order to ensure basic knowledge for other disciplines such as physiology, pathology and clinical courses.		
2.2.Course enrolment requirements and entry competences required for the course			
2.3.Learning outcomes at the level of the programme to which the course contributes	Following successful completion of the course, students will be able to apply acquired knowledge on gross anatomy and development of the trunk including the viscera during preclinical and clinical courses.		
2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following successful completion of the course, students will be able to: list and describe major anatomical structures of the trunk including the viscera of domestic mammals explain the development of the viscera apply anatomical nomenclature skilled communicate anatomical information utilize dissection skills		
2.5.Course content broken down in detail by weekly class schedule (syllabus)	Lectures: 1. Skeleton of the trunk: structure and development (1 hour), 2. Body cavities and their serous lining (2 hours), 3. Heart: structure and development (3 hours), 4. Lungs: structure and development (1 hour), 5. Digestive system: structure and development (4 hours), 6. Urinary and genital organs: structure and development (4 hours), 7. Mammary gland: structure and development (2 hours), 9. Blood vessels, nerves and lymphatic nodes of the trunk and viscera (3 hours) Practicals:		

	1. Skeleton of the trunk (thoracic, lumbar and caudal vertebrae, ribs, sternum) (5 hours), 2. Regions of the trunk (2 hours), 3. Mammary gland (4 hours), 4. Respiratory muscles (except diaphragm) (4 hours), 5. Thoracic and pectoral cavities, pleurae and pleural cavities (3 hours), 6. Trachea and lungs (5 hours), 7. Thymus, oesophagus, phrenic nerve, vagal nerve, sympathetic trunk (7 hours), 8. Pericardium and the heart (10 hours), 9. Blood vessels in the pectoral cavity (6 hours), 10. Transversus thoracis muscle, longus colli muscle, diaphragm (5 hours), 11. Abdominal wall, inguinal canal, external male genital organs (10 hours), 12. Peritoneum (3 hours), 13. Intestine (6 hours), 14. Stomach (5 hours), 15. Liver and pancreas (4 hours), 16. Spleen, abdominal aorta, caudal vena cava, portal vein, nervous system of the abdominal cavity (5 hours), 17. Urinary system and adrenal gland (4 hours), 18. Female genital organs (4 hours), 19. Pelvic cavity, accessory genital glands, rectum, internal iliac artery (4 hours), 20. Muscles of the back (4 hours).					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities	Students are expected to attend lectures and dissection exercises and prepare cadavers according to course instructions.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1.44	Research		Practical training	0.8
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	2.56	Oral exam	3.2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimum number of points		Maximum number of points	
	Lecture attendance		3		6	
	Practical training attendance		8		12	
	Active participation in the practical training		5		10	
	Tests		20		32	
	Oral exam		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	KÖNIG, H. E., H.-G. LIEBICH (2007): Veterinary anatomy of domestic mammals, Textbook and color atlas. 3 rd Ed. Schattauer, Stuttgart, New York					
	DYCE, K. M., W. O. SACK, C. J. G. WENSING (2010): Textbook of veterinary anatomy. 4 th Ed. Saunders Elsevier, Philadelphia.				4	
	DONE, S. H., P. C. GOODY, S. A. EVANS, N. C. STICKLAND (2009): Color atlas of veterinary anatomy. Volume 3. The dog and cat. 2nd Ed. Mosby Elsevier, Edinburgh, London, New York.				1	

	EVANS, H. E., A. de LAHUNTA (2010): Guide to the dissection of the dog. 7 th Ed. Saunders Elsevier. Philadelphia.		
	McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary embryology. Blackwell Publishing, Dublin.		
2.12. Optional literature (at the time of submission of study programme proposal)	<p>NICKEL, R., A. SCHUMMER, E. SEIFERLE (1986): The locomotor system of the domestic mammals. Volume I. Verlag Paul Parey, Berlin, Hamburg.</p> <p>NICKEL, R., A. SCHUMMER, E. SEIFERLE (1979): The viscera of the domestic Mammals. Volume II. 2nd revised Ed. Verlag Paul Parey, Berlin, Hamburg.</p> <p>NICKEL, R., A. SCHUMMER, E. SEIFERLE (1981): The circulatory system, the skin, and the cutaneous organs of the domestic mammals. Volume III. Verlag Paul Parey, Berlin, Hamburg.</p> <p>EVANS H. E., A. De LAHUNTA (2012): Miller's anatomy of the dog. 4th Ed. WB Saunders Company, Philadelphia, London.</p> <p>SCHALLER, O. (2007): Illustrated veterinary anatomical nomenclature. 2nd Ed. Ferdinand Enke Verlag, Stuttgart.</p> <p>HYTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of domestic animal embryology. Saunders Elsevier, Philadelphia.</p> <p>SADLER, T. W. (2006): Langman's medical embryology, Lippincott Williams & Wilkins a Wolters Kluwer business. 10th Ed. Philadelphia, Baltimore, New York.</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading of active participation in the practical training, two written tests, final oral exam		

ANIMAL BREEDS' CHARACTERISTICS

1. GENERAL INFORMATION			
1.1. Course teacher	Sven Menčik, PhD, Assistant Professor	1.6. Year of the study programme	1st year
1.2. Name of the course	Animal breeds' characteristics	1.7. Credits (ECTS)	4.5
1.3. Associate teachers	Anamaria Ekert Kabalin, PhD, Full Professor Velimir Sušić, PhD, Full Professor (permanent) Ivan Vlahek, VMD Aneta Piplica, VMD	1.8. Type of instruction (number of hours L + S + E + e-learning)	12 (L)+ 2 (L e-learning) + 8 (S)+2 (S e-learning) 34 (E)+ 2 (E e-learning)
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2 20%
2. COUSE DESCRIPTION			
2.1. Course objectives	The course topics provide the student with knowledge about general animal breed characteristics and animal breeds which are a reflection of genetically specific quality in animals of certain species. Students will be able to evaluate particular animal breed which is important for proper use of animals in different production systems.		
2.2. Course enrolment requirements and entry competences required for the course			

<p>2.3. Learning outcomes at the level of the programme to which the course contributes</p>	<p>Upon finishing the course, student is able to recognize particular breed/type/subtype and understand general characteristics which are important for proper use of animals and maintaining their health.</p>
<p>2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</p>	<p>After successfully finishing the course student will be able to:</p> <ul style="list-style-type: none"> - explain the morphological, physiological and psychological changes of animals after domestication and selection directed to certain characteristics as well as animal breed characteristics (general and special) - identify the species, breed, category and / or production type of domestic animals (cattle, horses, pigs, sheep, goats, donkeys, poultry, dogs, cats and the most important breeds of rabbits, laboratory animals and cage pets) - describe the exterior of certain domestic animals - evaluate production type or breeding group based on individual phenotypic characteristics - use the gained knowledge in judging the exterior, condition, constitution, temperament and age as well as measuring and marking of animals - identify basic administrative books, forms and computer programs used in the registration of domestic animals
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>Methodological unit / course content with the number of hours (lectures, seminars, exercises and e-learning)</p> <p>1. Introduction to breeding of most important animal species for production, companion and laboratory animals (domestication, different usage of animals, breed as base for breeding of animals) Number of hours: 2 L+0 S+2 E</p> <p>2. General and specific biological characteristics of animals (reproduction; growth; constitution; condition; temperament and temper; exterior-age, body measures, evidention and registration) Number of hours: 2 L+0 S+6 E</p> <p>3. Breeds and hybrids of pigs and poultry Number of hours: 2 L+2 S+ 8 E</p> <p>4. Breeds of cattle and horses Number of hours 2 L+ 2 S+8 E</p> <p>5. Breeds of sheep and goats Number of hours 2 L+2 S+4 E</p>

	<p>6. Breeds of dogs and cats Number of hours 2 L+2 S+4 E</p> <p>7. Most important species of laboratory animals. Rabbits, fur animals, cage pets Number of hours 2 L (e-learning) +0 S+2 E</p> <p>8. The role of breed in livestock production (genotype environment interaction, specific products) Number of hours 0 L+2 S (e-learning)+2 E</p>	
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)
2.8. Student responsibilities	<p>Student obligations are defined with the Regulations on the integrated undergraduate and graduate study of veterinary medicine. From total 100 points, student must acquire a minimum number of points from all elements of assessment in order to pass the subject. The final grade is based on the sum of points (scores). The scoring of individual elements of assessment:</p> <p>Attending lectures and e – learning; a total of 6 points (the lowest number of points that a student should gain from this element is 3 points). Attending seminars; a total of 6 points (the lowest number of points that a student should gain from this element is 4 points). attending exercises (intramural and extramural-farms as a field course); a total of 6 points (the lowest number of points that a student should gain from this element is 4 points). Active participation in seminars and exercises (solving exercises in LMS and self-check during the exercises and interpretation of tasks); a total of 10 points (the lowest number of points that student should gain from this element is 5 points). Continuous knowledge checking (colloquia); a total of 32 points (the lowest number of points that a student should gain from this element is 20 points); during the course 3 colloquia will be organised - the first (1st) has a total of 12 points and a student should gain at least 58% (7 points), while the other two the 2nd and the 3rd have 10 points each and a student should gain at least 65% (6.5 points) of each colloquium. Final exam -written form on LMS platform; a total of 40 points (the lowest number of points that student should gain from this element is 24 points).</p>	

2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.81	Research		Practical training															
	Experimental work		Report		Activity	0.45														
	Essay		Seminar essay		(other)															
	Tests	1.44	Oral exam		(other)															
	Written exam	1.8	Project		(other)															
2.10. Grading and evaluating student work in class and at the final exam	<p>The final grade is based on the total sum of the points from all of elements of assessment (attendance of lectures, seminars, exercises and e-learning; practical / individual work on tasks, colloquia and final exam). The evaluation is carried out according to the distribution below. The final score is expressed quantitatively, with points and adequate grade, from 1 to 5. Students who have not passed the item shall be rated as unsatisfactory (with grade one - F).</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>do 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>						Points	Grade	do 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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77-84	3 (C)																			
85-92	4 (B)																			
93-100	5 (A)																			
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media															
	Mason, I. L.: World dictionary of livestock breeds, types and varieties. 5th Edition. CABI Publishing, 2002.			1 in the library of the Department	no															
	Fogle, B.: The new encyclopedia of the dog. Dorling Kindersley Publishing, Inc., 2000.																			
	Helgren, A.J.: Encyclopedia of cat breeds. Barrons Educational Series, Inc., 2013.																			
	Ward, J.D.: A Manual for laboratory animal management. World Scientific Publishing, 2008.																			

2.12.Optional literature (at the time of submission of study programme proposal)	On-line basis with data about breeds of animals available on LMS platform VEF-LMS.
2.13.Quality assurance methods that ensure the acquisition of exit competences	Students' work will be monitored on tasks that are performed during the seminars and exercises, through conversations (on lectures, seminars, exercises, on-line via LMS), as well as through the results of the self check work during the exercise and seminars and results obtain on colloquia. At the end of teaching the knowledge of students and independence in work will be verified by a final examination.
2.14.Other (as the proposer wishes to add)	

BASIC STATISTICS IN VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Assistant Professor Sven Menčik, DVM, PhD,	1.6. Year of the study programme	1st
1.2. Name of the course	Basic statistics in veterinary medicine	1.7. Credits (ECTS)	2,5
1.3. Associate teachers	Full Professor Velimir Sušić, DVM, PhD Full Professor Anamaria Ekert Kabalin, DVM, PhD, Assistant Professor Maja Maurić, DVM, Ivan Vlahek, DVM Aneta Piplica, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	8 (L) + 0 (S) + 16 (E) + 6 (e-learning)
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	-
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	Adoption of facts about the significance of statistics for veterinary profession, getting theoretical and practical skills necessary for optimal planning and performing statistical observation, as well as data analysis and concluding about principles of events in veterinary medicine. Students will learn about different software system with the aim of achieving new skills related to different program environments during the statistical analysis		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	Acquiring knowledge about the collection, processing and presentation of statistical data sets and their analysis and interpretation. Hypothesis, their evaluation and testing in veterinary medicine. Criteria for the selection of individual tests. Interdependence of characteristics and the possibility of their application in veterinary medicine.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course the student will be able to: <ul style="list-style-type: none"> - identify the types of variables, - interpret the results of basic statistical data processing and analysis, - determine the normality of variables, - select the test to verify the hypothesis, - determine the correlation between two or more variables - familiarize with programming environments for statistical analysis 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Methodological unit / course content	class schedule (lectures + exercises + e-learning)	
	Statistics – definition, development, application in veterinary, biomedical and animal science, use of computers in statistics and data analysis. Data entry and processing in Statistica	2 L	

	v.13.3 program (StatSoft Inc., TIBCO, 2017). Variables – the nature of expression and scales of measurement. Data collection – definition and size (population and sample). Statistical observation and collecting the data.	
	Meaning and the use of the representative values of the statistical data set. Data collection outline, tables and graphs. Meaning and using of representative values of statistic data collection - arithmetic mean, geometric mean, harmonic mean, median, mode.	1 L + 4 E + 1e-learning
	Learning objectives and calculation of the indicators variability in the statistical data set. Measures of dispersion (spread) - variance, standard deviation, range, interquartile range, coefficient of variation. Measures of layout - measures of asymmetry and kurtosis.	1 L + 2 E + 1e-learning
	The concept and expression of probability. Relevance and definition of probability. Continuous probability distributions – normal (Gaussian), Student's <i>t</i> -, Chi-squared and <i>F</i> -distribution. Single result status in distribution and errors while working with samples.	1 L + 1 E + 1e-learning
	The representativeness of the sample according to population - the type and size of the sample, the standard error of the sample. Determination of the confidence interval for the mean. An introduction to statistical hypothesis-definition, acceptance and rejection. Introduction to hypothesis testing-parametric and non-parametric tests; test choosing criteria.	1 L + 1 E + 1e-learning
	Hypothesis testing. Parametric test for analyses (Student's <i>t</i> -test for independent samples, <i>t</i> -test for dependent samples, One-way ANOVA and Repeated Measure ANOVA) and Non – parametric test for analyses (Mann-Whitney U-test, Wilcoxon rank sum test, Kruskal-Wallis analysis of variance, Friedman two way ANOVA and Chi-squared test).	1L + 6 E + 1e-learning
	Introduction to linear correlation and regression analysis. Introduction to further regression analysis. Introduction to the basic of R program.	1L + 2 E + 1e-learning
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work <input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments: -
2.8. Student responsibilities	Student obligations are defined with the Regulations on the integrated undergraduate and graduate study of veterinary medicine. Given the above, the student must acquire a minimum number of points from all elements of assessment in order to pass the subject. The final grade is based on the sum of points (scores). The scoring of individual elements of assessment: - Attending lectures and e - learning: a total of 6 points (the lowest number of points that a student should gain from this element is 3 points) - Attendance exercises: a total of 12 points (the lowest number of points that a student should gain from this element is 8,4 points) - Active participation in exercises (solving and interpretation of tasks): a total of 10 points (the minimum number of credits that a student should gain from this element is 5 points). - During the term students have to fulfil the given assignments in eight programme exercises regarding the input, analysis and saving data. Each successful exercise or task earns them 0,5 points.	

	<p>- During the periods of the second (2nd) to the seventh (7th) exercise, the students will have to do a self-check exam based on five questions in the LMS System, according to the given exercise topic. Each successful self-check exercise with more than 50% of correct answers earns them 0,5 points.</p> <p>- During oral examination revision periods, as well as after every finished exercise, students are allowed to interpret the given results and can get another extra point there. For the successful task completion and independent data analysis using Microsoft Excel students can earn another point.</p> <p>- During the term students need to achieve a minimum of 5 points (different combinations in solving programme exercises, self-checks, oral results interpretations / oral exams). A maximum number of points here is 10.</p> <p>- Continuous knowledge checking (colloquia): a total of 32 points (the minimum number of credits that a student should gain from this element is 20 points). During the term at the beginning of the regular exercise hours there will be organized four (4) colloquia as a written assessment of knowledge. Each of the colloquia carries 8 points, student must successfully solve at least 50% to achieve a minimum of 4 points. From all the colloquia student must achieve at least 20 points.</p> <p>- Final exam: a total of 40 points (the lowest number of points that a student should gain from this element is 24 points)</p>					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,45	Research		Activity	0,25
	Experimental work		Report			
	Essay		Seminar essay			
	Tests	0,8	Oral exam			
	Written exam	1	Project			
2.10. Grading and evaluating student work in class and at the final exam	The final grade is based on the total sum of the points from all of these elements of assessment (attendance of lectures, exercises and e-learning; practical / individual work on tasks, colloquia and final exam). The evaluation is carried out according to the distribution below. The final score is expressed quantitatively, with points and adequate grade, from 1 to 5. Students who have not passed the item shall be rated as unsatisfactory (with grade one - F).					
		<i>Points</i>		<i>Grade</i>		
		do 59		1 (F)		
		60-68		2 (E)		
		69-76		2 (D)		
		77-84		3 (C)		
		85-92		4 (B)		
		93-100		5 (A)		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Petrie i Watson: Statistics for Veterinary and Animal Science. Blackwell Publishing, 3rd Edition, 2013.			2 books in Department library	no	
2.12. Optional literature (at the time of submission of study programme proposal)	Ennos, R: Statistical and Data Handling Skills in Biology. 3 rd edition. Pearson, 2011 Manuals of statistical software (SAS, Statistica, Excel). Prepared written materials of lectures and exercises.					
2.13. Quality assurance	During teaching students' work will be monitored on tasks that are performed during the exercises, through conversations (on lectures, exercises, online via					

methods that ensure the acquisition of exit competences	LMS), as well as through the results of colloquia. At the end of teaching, the knowledge of students and independence in work with computer programs will be verified by a final (written) examination.
2.14. Other (as the proposer wishes to add)	-

BIOCHEMISTRY IN VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Renata Barić-Rafaj	1.6. Year of the study programme	first
1.2. Name of the course	Biochemistry in Veterinary Medicine	1.7. Credits (ECTS)	7.5
1.3. Associate teachers	Andrea Tumpa, mag. med. biochem.	1.8. Type of instruction (number of hours L + S + E + e-learning)	30 + 12 + 30
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Objective of studying biochemistry is exploring the structure and function of the body. Modern biochemistry is in constant interaction with medicine, so the acquisition of knowledge about the biochemical and energetic changes and the regulation of metabolic processes in the body of healthy animals provides a biochemical basis for understanding the physiological processes, as well as the basis for understanding the consequences of disorders of metabolic pathways. Management of certain metabolic processes or change their courses according to our needs and goals is possible only with a good knowledge of biochemical pathways. During practical work in the lab, students will learn about the principles of individual techniques used in the laboratory.		
2.2. Course enrolment requirements and entry competences required for the course	attendance in Medical Chemistry		
2.3. Learning outcomes at the level of the programme to which the course contributes	general understanding of the biochemical principles, the major metabolic pathways, as well as their regulation		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>After successfully passing the course student will be able to:</p> <ul style="list-style-type: none"> - to define the structure of most proteins, carbohydrates and fats in the body, and the importance of certain types of chemical bonds in metabolic processes - to explain the correlation of structure and main function of most proteins, carbohydrates and fats - to show the sequence of biochemical changes in the major metabolic pathways, explain the effect of the major enzyme systems in catalysis of certain reactions - to analyse the ways of regulation of biological activity 		

	<ul style="list-style-type: none"> - to apply a simple biochemical methods for measuring analytes in biological samples - to understand the connection of metabolic pathways and accept the theoretical basis for the selection and evaluation to the results of various laboratory measurements - to understand changing of metabolic pathways using various treatment procedures 					
2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures: 1 Aminoacids, 2. Protein structure, 3 Enzymes, 4. Hemoglobin, 5. Collagen, Basics of cell signaling, 6. Metabolism 7.ATP, Glycolysis, 8. Glycolysis, 9.Gluconeogenesis, Glycogen, 10. Citric Acid Cycle, 11. Oxidative Phosphorylation, 12. Pentose phosphate pathway, 13. Lipids: 14. Urea cycle, 15. Integration of metabolism</p> <p>Seminars: 1 Posttranslational modification of amino acids, 2. Plasma proteins, 3. Michaelis-Menten kinetics, 4. Metabolism of hemoglobin, 5. Anaerobic glycolysis, 6. Inhibitors of oxidative phosphorylation, 7. Vitamins, 8. Glutathione, 9. cAMP, 10. Ketone bodies, 11. Specific derivats of aminoacids, 12. Integration of metabolism</p> <p>Exercises: 1 Isolation methods 2. Proteins, 3. Enzymes – kinetics, 4. Enzymes, 5. Hemoglobin, 6. Carbohydrates, 7. Glycogen, 8. Enzyme regulation 9. Lipids, 10. Urea, 11. Urinalysis 12. ATP calculation</p>					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8. Student responsibilities	presence at lectures, seminars and excercises, practical activity at seminars, successfully performed practical exercises, successfully passed the final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	class attendance	1,35	research		activity	0,75
	experimental work		report		knowledge verification - seminars	
	essay		seminar essay		knowledge verification - exercises	
	tests	2,4	oral exam			
	written exam	3	project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>attending classes lectures: 0.4 x 15 lectures = max 6, min 3 points</p> <p>attending classes seminars: 0.5 x 12 seminars = max 6, min 4 points</p> <p>attending classes exercises: 0.5 x 12 exercises = max 6, min 4 points</p> <p>activity seminars: 1,25 point (short questions) x 4 seminars = max 5, min 2,5 points</p> <p>activity exercises: 0.55 (0.25 successfully exercise, 0.3 point short questions) x 9 exercises = max 5, min 2,5 points</p> <p>continual knowledge testing: 1 mandatory colloquium max 32, min 20 points, (required for the exam, 3 terms during the course + 1 during the first term of the exam = max 4 times), 3 optional colloquium, max 40, min 24, (one term for 1. coll. , one term for 2. coll, one term for 3. coll), if on each of the three achieved 24 min - recalculated as successfully passed exam</p> <p>final exam=max 40, min 24 points</p>					

	final grade is based on total points		
	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	J. M.Berg, J. L.Tymoczko, L. Stryer : Biochemistry, New York: W H Freeman ; 2002. T. M. Devlin - Textbook of Biochemistry with Clinical Correlations, A.J.Willey, New York,2006. Seminars – script Exercises - script	150 0	web web
2.12.Optional literature (at the time of submission of study programme proposal)			
2.15. Quality assurance methods that ensure the acquisition of exit competences	Continuous knowledge verification, scoring active participation in class, the final exam		
2.16. Other (as the proposer wishes to add)			

BOTANY IN VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Full prof. Ksenija Vlahović, PhD	1.6. Year of the study programme	1st (first)
1.2. Name of the course	Botany in veterinary medicine	1.7. Credits (ECTS)	1,5 ECTS
1.3. Associate teachers	Prof. Josip Kusak, PhD; Full prof. Maja Popović, PhD; Prof. Tomislav Gomerčić, PhD; Assistant prof. Daniel Špoljarić, PhD; Fodder plants: Professor Željko Mikulec, DVM, PhD, Poisonous plants: Professor Andreja Prevendar Crnić; DVM, PhD; Important honey plants in Croatia: Associate Professor Daniel Špoljarić; DVM, PhD Medicinal plants: Maja Popović	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+0+10
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be able to distinguish basic systematic categories of plants important for veterinary medicine. They will be able to recognise mutual dependence of plants and animals within the whole ecosystem. They will get acquainted with morphologic basis of fodder plants from plough-fields and grasslands. They will be aware of medicine plants groups as well of plants poisonous for animals. They could get required information on plants important in veterinary medicine using botanic literature and data basis.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	The course contributes to higher competences in the field of animal breeding. Assisted reproductive technologies like Artificial insemination, Superovulation, In vitro Fertilization, Embryo Transfer have been introduced to overcome reproductive problems, to increase the offspring from selected female's and to reduce the generation intervals in farm animals. This advanced reproductive technologies provides a powerful tool for rapid change in animal population, genetically. As this technologies will play an important role in future perspective for efficient reproductive performance in livestock, this course presents an important part in education of new generation of students.		

2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>The expected outcomes are: After successful completion of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Compare the structure of prokaryotic and eukaryotic cells and enumerate groups of prokaryotes and explain their significance for animal health as well as the role and application of bacteria in the biosphere and life of humans and animals 2. Distinguish basic systematic categories of plants important for veterinary medicine 3. Differentiate morphology group of plants important in animal nutrition and identify groups of medicinal and honey plants and groups of plants poisonous to animals 4. Draw and explain the processes associated with cell division in plants and animals, and operate a light microscope and draw observed cells and intracellular structures 5. Written to summarize their knowledge of the structure of plant cells and the function of its organelles with special reference to material, accommodation and the role of DNA molecules 6. Demonstrate their knowledge in the process of separating molecules of DNA from plant cells 7. Explain the processes that arise from inorganic organic matter and light energy is converted to chemical (division reaction, photolysis of water and the respiratory chain) 8. Systems used to search for content relevant to botany in veterinary medicine using literature and databases 					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Basic principles in life organisation of plants; Systematics, evolution and phylogenetic relations among plants; Plant cell; Biogenetics and metabolism of plan cell; DNA molecule isolation from plants; Review of the kingdom of the plants with acknowledging of most important plant families for veterinary medicine; Floristic kingdoms and their floristic and vegetation resources; Photosynthesis; Medicinal plants in veterinary medicine; Poisonous plants in veterinary medicine; Fodder plants and important honey plants in Croatia. Field classes: 1. Lonjsko polje; Getting acquainted with basic ecological patterns of ecosystem functioning in hilly forests; Basic flora and fauna species; Natural resources conservation and problems; Nature conservation principles; Functioning of flood ecosystems; Traditional agronomy and stock breeding; Preserving of autochthonic breeds in situ (turpoljska svinja, posavski konj); Jakuševac (on the way to Lonjsko polje); Comprehension of indispensable care for waste disposal. Wild and domestic animals at waste disposal. 2. Park Maksimir: Forest community; Meadow association</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Students are obliged to participate lectures, seminars and exercise.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,27	Research		Practical training	
	Experimental work		Report		Participation in the training (other)	0,15
	Essay		Seminar essay		(other)	
	Tests	0,48	Oral exam		(other)	
	Written exam	0,6	Project		(other)	

2.10. Grading and evaluating student work in class and at the final exam	<p>The total students' obligations at the course:</p> <p>Start and finish times of lessons, time-table and location of lessons will be announced on the Institute and Veterinary faculty notice board as well as on their web pages. Lecturers and assistants which will hold the lessons, the way of taking the exam and examination standards for the course "Botany in veterinary medicine" in autumn semester are being defined as follows:</p> <ol style="list-style-type: none"> 1 attending lectures 2 attending exercises 3. participation at exercises and seminars 4 continuous knowledge checking 5 final exam <p>During the session for the „Botany in veterinary medicine" course the student must attend 5 lecture lessons in order to gain 3 minimal points. The maximum gained number of points from this evaluation element is 6 points.</p> <p>During the session student must attend 7 exercise lessons in order to gain 8 minimal points during the semester. The maximum gained number of points from this evaluation element is 12 points.</p> <p>During the session at the time of exercises student must do provided tasks from 5 programming exercises and for a completed task she/he gets a signature from the lecturer. Each well done and signed programming exercise is worth 1.4 points. For programming exercises in practicum a student can gain total of 7 points for 5 programme exercises. After a field work lesson (there are 2 field work lessons planned) a student gains 1.5 points if she/he wrote and /or collected predetermined materials. For two positive oral answers during the exercises student gains additional 1.5 points. During the session student must gain total of 5 points in order to have the minimal number of 5 points. Maximal number of points gained from this evaluation element is 10.</p> <p>During the session 4 preliminary exams will be organized at the time of exercises each of them consisting 5 tasks or questions. Each correctly done task or well answered question is worth 1 point. In context of this evaluation element it is possible to gain the maximum of 20 points. Student must gain total of 13 points from the preliminary exams in order to gain minimum of 20 points. The total gained number of points from this evaluation element is 32 points. Student who does not gain minimum of 13 points during the session has right to take a makeup preliminary exam which will comprise material from all programming exercises and will be organized upon completion of the teaching in the session. Total number of points at the preliminary exam is 20. Student who does the makeup exam with better-than 50% results has right to take the final exam.</p> <p>The final exam starts with a student's short analysis of results gained from the first four types of activities of attending lecture. Questions in the final exam will be put in a way that a student can answer in writing. The maximum number of points that can be gained from the final exam is 60 points, where 1 point = 1 correct answer (60 questions = 60 points). Student must show at least a sufficient knowledge at the final exam, with no regard to gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 36 in order to gain minimal number of 24 points. In case a student does not satisfy at the final part of the exam, the lecturer determines time for reexamination.</p> <p>Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements, according the following table:</p>		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	1. Moore, R., W. D. Clark, K. R. Stern, D. Vodopich (1995): Botany. Wm. C. Brouwn Publishers.	5	
	2. Wynn, S.G., Fougere (2007): Veterinary herbal medicine. Mosby Elsevier.	5	

2.12. Optional literature (at the time of submission of study programme proposal)	
2.13. Quality assurance methods that ensure the acquisition of exit competences	Final written exam.
2.14. Other (as the proposer wishes to add)	

ENVIRONMENT, ANIMAL BEHAVIOUR AND WELFARE

1. GENERAL INFORMATION			
1.1. Course teacher	Gordana Gregurić Gračner, DVM, PhD, Associate Professor	1.6. Year of the study programme	1 th
1.2. Name of the course	Environment, animal behaviour and welfare	1.7. Credits (ECTS)	3
1.3. Associate teachers	Kristina Matković, DVM, PhD, Full Professor; Mario Ostović, DVM, PhD, Assistant Professor; Ivana Sabolek, DVM, Assistant	1.8. Type of instruction (number of hours L + S + E + e-learning)	L8+ S8+E24
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The course is one of the basic subjects in preventive veterinary medicine, in which students will acquire due knowledge on the concept of animal behaviour and welfare, to ensure such conditions in practice in which the animal will express the behaviour characteristic of its species while feeling well itself. In addition, knowledge about the impact of ground and water on animal health condition, production and reproduction as well as about the influence of animals upon these environmental factors will be acquired in order to preserve proper bio ecologic relationships in the environment. This approach in presentation of particular topics meets the conditions necessary for full understanding and acquisition of knowledge in other courses in preventive veterinary medicine, primarily in the course "Hygiene and Housing of animals", included in further studies in semesters 3 rd and 4 th .		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Understanding the concept of animal behaviour and welfare Understanding of mutual impact of animals and environment (soil, water) in order to positive influence on animal health condition, production and reproduction as well as to preserve proper bio ecologic relationships in the environment		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course the student will be able to: -explain the effect of soil and water on health, production and reproduction of animals, but also explain the animal impact on the environment in order to preserve the biological and ecological relationships in it -interpreting results of soil and water examinations -organize grazing systems for animals on the basis of climate-specificity, depending of their species, number and health -identify physiological and abnormal behaviour in domestic animals -self-judge the benefit of (farm) animals in the context of their behaviour		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 Animal behaviour (Introduction in animal behaviour; Evolution of behaviour; Mechanisms of behaviour; Understanding behaviour complex; Specific behavioural features of particular domestic animals, Abnormal behaviours); 2 Animal welfare (Health in the context of animal welfare; Role of veterinarian in animal welfare; Welfare of different animal species; Legislative regulations on animal welfare, animal welfare assessment); 3 Soil hygiene (Ecosystem – soil – plant – animal; Soil as a hygiene factor: relief, colour, texture, porosity, water regimen, temperature, telluric diseases; Hygienic evaluation of soil); 4 Drinking water hygiene (Origin and types of water; Water conditioning; Water-borne diseases; Animal need of water); 5 Hygiene of surface water (Water quality in salmonid and cyprinid fish-farms; Quality of surface water and its biologic assessment); 6 Pasture hygiene (Types of pasture; Pasture as a mediator in disease transmission; Animal preparation for pasture; Organization of pasture for particular animal species; Pasture load; Pasture management).					
2.6. Format of instruction:	X lectures X seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments X multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	1. attending lectures 2. attending exercises 3. attending seminars 4. participation at exercises and seminars 5. continuous knowledge checking 6. final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Attending lectures	0,18	Research		Practical training	
	Experimental work		Report		Attending seminars	0,18
	Essay		Seminar essay		Attending excersises	0,18
	Continuous knowledg checking	0,96	Written exam (final exam)	1,2	Participation at exercises and seminars	0,30
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activities	Minimal number of points	Maximal number of points			
	attending lectures	3	6			
	attending seminars	4	6			
	attending exercises	4	6			
	participation at exercises and seminars	5	10			
	continuous knowledge checking	20	32			
	final exam	24	40			
	Total	60	100			
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	1. The Ethology of Domestic Animals (2009): An Introductory Text / edited by Per Jensen-2nd ed.					
	2. Appleby, M. C., B. O. Huges (2004): Poultry Behaviour and Welfare. CABI Publishing, London, UK.					

	3. Fraser, A., D. M. Broom (1996): Farm animal behaviour and welfare (3rd Edition). CABI Publishing, London, UK.		
	4. Harrison, R. M. (1995): Pollution: Causes Effects and Control (2nd Edition). The Royal Society of Chemistry, Cambridge, UK		
	5. Keeling, L., H. Gonyou (2001): Social Behaviour in Farm Animals. CABI Publishing, London, UK.		
	6. McFarland, D. (1999): Animal behaviour: Psychobiology, Ethology and Evolution (3rd Edition). Pearson Education Limited, Essex, UK.		
	8. Rollin, B. R. (2003): Farm Animal Welfare: Social, Bioethical, and Research Issue, Iowa State Press, USA.		
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Types of activities	Minimal number of points	Maximal number of points
	Attending lectures (16 hours)	3 $3/0.375 = 8$ lectures hours (min.)	6 $6/16 = 0.375$ (coefficient for attending 1 lecture hour)
	Attending seminars (18 hours)	4 $4/0.33 = 12$ seminar hours (min.)	6 $6/18 = 0.33$ (coefficient for attending 1 seminar hour)
	Attending exercises (6 hours)	4 $4/1 = 4$ exercise hours (min.)	6 $6/6 = 1$ (coefficient for attending 1 exercise hour)
	Participation at seminars and exercises (7 points ¹)	5 $5/1.43 = 4$ (coefficient 1.43) (a student must earn 4 points in order to gain minimal 5 points)	10 $10/7 = 1.43$ (coefficient 1.43)
	Continuous knowledge checking (8 points ²)	20 $20/4 = 5$ (coefficient = 4) (a student must earn 5 points in order to gain minimal 20 points)	32 $32/8 = 4$ (coefficient = 4)
	Final exam (40 points ³)	24 $24/1 = 24$ (coefficient 1) (a student must earn 24 points in order to have minimal 24 points)	40 $40/40 = 1$ (coefficient 1)
	Total	60	100
¹ – 7 points (three correct answers during the exercises (each answer is worth 1 point = 3 points) + preparation of seminar work during the semester (2 points, in case of PP additional 2 points)) ² – 8 points (8 question, each correct answer is worth 1 point) ³ – 40 points (written exam – 40 questions / 1 points for each correct answer; a student must have 24 correct answers in order to have minimal 24 points. On written exam student can earn maximal 40 points) The final grade is made on the basis of total sum of gained points as follows:			

	<i>Points</i>	<i>Grade</i>	
	up to 59	1 (F)	
	60-68	2 (E)	
	69-76	2 (D)	
	77-84	3 (C)	
	85-92	4 (B)	
	93-100	5 (A)	
2.14. Other (as the proposer wishes to add)			

HISTOLOGY WITH GENERAL EMBRYOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Snježana Kužir, Associate Professor	1.6. Year of the study programme	1
1.2. Name of the course	Histology with General Embryology	1.7. Credits (ECTS)	7
1.3. Associate teachers	Lucija Bastiančić, DVM Nikolina Škvorc, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+ 0 + 60
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate university study program of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.10. Course objectives	<p>Histology is one of the basic subjects of the medical sciences; it studies the structure of human and animal bodies, which can be seen only with the help of optic aids. Etymologically, histology is a science that studies the tissues of a body. However, it explores the complete microscopic and submicroscopic system of the organism.</p> <p>During the study, students of veterinary medicine improve their knowledge from macroscopic anatomy and at the same time, they gain insight into the correlation between the structure and function of organs and organic systems. Knowledge of the normal structures is essential for the recognition of changes in the structure of the tissue, organs and organic systems.</p> <p>Embryology deals with the embryonic development and enables the understanding of complex interrelations in the body of an animal. It is also of practical importance since it explains the emergence of anomalies during development.</p>		
2.11. Course enrolment requirements and entry competences required for the course	-		
2.12. Learning outcomes at the level of the programme to which the course contributes	<p>This course builds on the knowledge acquired in the anatomy courses. Students will be able to identify, describe, connect, analyze, explain and integrate the macroscopic and microscopic structure of individual organs and systems. It is also the basis for understanding and linking the physiology, pathophysiology and pathology. Students will be able to explain the characteristics of individual cells and tissues that will give a further understanding of physiological, pathophysiological and pathological processes, which is a prerequisite for understanding the pathomorphological changes in the pathogenesis of diseases.</p>		
2.13. Learning outcomes expected at the level of the course	<p>By the end of this course the student should be able to:</p> <ul style="list-style-type: none"> -recognize and define the basic elements of the microscopic structures of tissues and organs of animals 		

<p>(4 to 10 learning outcomes)</p>	<ul style="list-style-type: none"> -explain and compare the structure of certain organs in different animal species; -propose the necessary histological method of processing the sample; -independently cut off a piece of tissue and fix it correctly for the selected histological method; -use the microscope efficiently for the purpose of analysis and study of histological slides; -recognize and analyze the histological slides of various organs and tissues; -examine the relations between the structures and development of domestic animals
<p>2.14.Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>1 Cytology (Cell components. Cell nucleus and nucleolus. Cytoplasm. Plasma membrane structure. Endocytosis and exocytosis through plasma membrane. Mitochondria. Ribosomes. Endoplasmic reticulum. Golgi complex. Lysosomes. Peroxisomes. Cytoplasmic skeleton and inclusions. Cell locomotion. Chemotaxis. Movements within cells. Cell death.) 2 Application of Histological methods (Basic principles of histology. Preparation of tissues for microscopic examination. Staining methods, routine staining and elective staining. Basic principles of histochemistry and cytochemistry. imunocytochemistry. Basic parts of the microscope, using microscope and interpretation of images. Artefacts.) 3 General embryology (Early stages of development in mammals and birds. Primordial germ cells. Spermatogenesis. Oogenesis. Fertilization. Cleavage of fertilized cells in domestic animals. Cleavage of fertilized cells in birds. Gastrulation. Differentiation of ectoderm, endoderm and mesoderm. Formation of notochord. Neurulation. Folding-off the embryo. Body formation. Malformations.). 4 Epithelial tissue (Basement membranes and basal lamina. Intercellular junctions. Specializations of the cell surface. Epithelium classification. Covering epithelia. Simple epithelium. Stratified epithelium. Transitional epithelium. Pseudostratified epithelium. Glandular epithelia cells features. Ultra structure of glandular epithelium cells. Ways of excretion. Monocellular glands. Multicellular glands. Simple glands. Complex glands. Alveolar glands. Tubular glands. Serous, mucous and mixed glands. Organization of large exocrine glands. Myoepithelial cells.). 5 Connective tissue (Ground substance. Types of collagen. Collagen biosynthesis and degradation. Collagen fibers. Reticular fibers. Elastic fibers. Dense and loose connective tissue. Mesenchymal cells. Fibroblasts and fibrocytes, White fatty cells. Brown fatty cells. Macrophages. Mononuclear phagocyte system. Other free cells of connective tissue) 6. Blood (Red blood cells. Neutrophil granulocytes. Eosinophil granulocytes. Basophile granulocytes. Lymphocytes. Monocytes. Blood platelets. Bone</p>

marrow and hematopoiesis). 7 Supportive tissues (Hyaline cartilage. Elastic cartilage. Fibrocartilage. Microscopic structure of a bone. Bone cells. Bone matrix and collagen fibers. Periosteum and endosteum. Types of bone. Histogenesis of bone. Intramembranous ossification. Endochondral ossification. Growth and remodeling of bones. Joints.). 8 Muscle tissue (Smooth muscle features. Ultrastructure of smooth muscle cells. Ultrastructure of skeletal muscle fibers. Muscle fibrils. Sarcoplasmic reticulum. Mechanism of contraction. Organization of skeletal muscle. Cardiac muscle features. Cardiac muscle fibers. Proprioceptor system.). 9 Nerve tissue (Neuron. Neuron classification. Parts of neuron: perikaryon, dendrites, axons. Synapses. Cell neurology. Myelination. Myelinated nerve fibers. Unmyelinated nerve fibers. Spinal and vegetative ganglia. Nerve structure.) 10 Central nervous system (Histogenesis of the central nervous system. Meninges. Cerebrum. Cerebellum. Spinal cord.). 11 Eye and Ear (Photoreceptor system. Eye and accessory structures of the eye. External layer. Middle layer. Internal layer. Lens. Vitreous body. Conjunctiva. Eyelids. Lacrimal organs. Audioreceptor system. External ear. Middle ear. Internal ear. Vestibular organ.). 12 Endocrine system (Diffuse neuroendocrine system. Hypophysis development. Hypophysis structure: adenohipophysis and neurohypophysis. Hypophysis portal system. Epiphysis, Thyroid gland. Synthesis and hormone accumulation caused by activity of follicular cells. Epithelial corpuscles. Adrenal gland development. Adrenal gland structure: cortex and medulla. Islets of Langerhans). 13 Integumentary system. Skin and skin derivate. (Skin structure in domestic animals. Epidermis. Melanocytes. Langerhans' cells. Merkel's cells. Dermis. Subcutaneous tissue. Development of hairs. Hair structure. Skin characteristics based on animal species. Hair follicles. Tactile hairs. Mammary gland structure. Hoof. Claw. Horn. Skin in poultry. Feather. Somatic and visceral receptor system). 14 Digestive system (General structure of the digestive tract. Lips. Cheeks. Tongue and tongue papilla. Organ of taste. Hard palate. Soft palate. Teeth development. Brachyodont teeth. Hypsodont. Oropharynx. Esophagus. Glandular stomach. Cardiac gland region. Fundic gland region. Pyloric gland region. Rumen. Reticulum. Omasum. Abomasum. Avian glandular stomach. Small intestine: duodenum, jejunum, ileum. Large intestine: caecum, colon, rectum. Glands attached to digestive tube: liver, pancreas, salivary glands); 15 Respiratory system (Nasal cavity. Olfactory organ. Nasopharynx. Larynx. Trachea. Bronchial tree. Structure of bronchi. Bronchioles. Blood-air barrier. Avian respiratory system); 16. Urinary system (Kidney: developmental stages: pronephros, mesonephros and metanephros. Kidney structure: nephron, renal corpuscle, proximal

convoluted tubule, loop of Henle, distal convoluted tubule, collecting ducts and tubes. Juxtaglomerular apparatus. Blood circulation. Urinary passages. Urinary bladder. Avian urinary system.); 17 Male reproductive system (Testis: tubules seminiferous contorti, interstitium, Leydig's cells, tubules recti, rete testis, ductuli efferentes, and ductus epididymidis. Ductus deferens. Prostate gland. Seminal vesicles. Bulbourethral gland. Urethra masculine. Penis. Testis in cock); 18. Female reproductive system (Ovary: primordial follicles, follicles in growth, Graafian follicles. Interstitial endocrine cells. Ovulation. Corpus luteum. Follicular atresia. Oviduct. Uterus. Endometrium in domestic animals. Myometrium. Perimetrium. Estrous cycle. Uterine cervix. Vagina. Implantation. Fetus position. Extra embryonic membranes. Yolk sac. Amnion. Alantois. Chorion. Placentation. Omphaloplanceta. Alantochoial placenta. Placenta deciduata. Placenta nondeciduata. Morphological classification of placentas. 19 Cardiovascular system (Endocardium. Myocardium. Epicardium. Fibrous cardiac skeleton. Heart valves. Differentiation of angioblasts. Lymph vessels structures.) 20 Lymphatic system (Diffuse lymphatic tissue. T and B lymphocytes. Plasma cells. Antibodies. Lymph nodules. Tonsils. Lymph node. Hemal nodes. Spleen. Thymus. Bursa Fabricii);

Lectures:

General embryology (2h); Epithelial tissue (2h); Connective tissue (2h); Cartilage (1h); Bone (1h); Blood (1h); Muscle tissue (1h); Nerve tissue (1h); Central nervous system (1h); Eye and ear (1h); Endocrine system (1h); Integumentary system (1h); Cardiovascular system (1h); Lymphatic system (2h); Digestive system (4h); Respiratory system (2h); Urinary system (2h); Male reproductive system (1h); Female reproductive system (2h); Extra embryonic membrane (1h).

Exercises:

Cytology (2h); Epithelial tissues - simple epithelium, transitional epithelium (2h); Epithelial tissues - Pseudo stratified epithelium, stratified epithelium (2h); Epithelial tissues - glandular epithelium (2h); Connective tissue – fibers (2h); Connective tissue – cell (2h); Blood cell (2h); Cartilage (2h); Bone tissue (2h); Muscle tissue (2h); Nerve tissue (2h); REVISION (2h); Central nervous system (2h); Eye (2h); Endocrine system (2h); Integumentary system (2h); Cardiovascular system (2h); Lymphatic system – lymph nodules, lymph node (2h); Lymphatic system – thymus, spleen, bursa fabricii (2h); REVISION (2h); Digestive system I (2h); Digestive system II (2h); Digestive system III (2h); Digestive system IV (2h);

	Respiratory system (2h); Urinary system (2h); Male reproductive system (2h); Female reproductive system (2h); Extra embryonic membrane (2h); REVISION (2h).			
2.15.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> online in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.16. Comments:	
			The introduction of higher level of LMS for the course. In the exercises, students will use microscopes, which limits the size of the group to 8-12 students.	
2.17.Student responsibilities	Presence at lectures (min 15h or 3 points earned). Presence in practicals (min. 40h or 8 points earned). Activity in training (a minimum of 5 points earned). Passed Examination of two preliminary exams (min. 10 + 10 points earned). Final oral exam (min. 24 points earned).			
2.18.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,26	Research	Practical training
	Experimental work		Report	Activity) 0,7
	Essay		Seminar essay	(other)
	Tests	2	Control	(other)
	Written exam		Project	(other)
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures (3-6 points) During the "Histology and general embryology" course, students must attend 15 out of 30 hours of lectures in order to gain the 3 minimal points. The maximum number of points from this evaluation element is 6. Checking of attendance at lectures will be done by collection of students' signatures. One hour of a lecture (45 minutes) is equal to 0.2 points.			

Attending exercises (8-12 points)

During the "Histology and general embryology" course students must attend 40 out of 60 hours of exercises in order to gain the 8 minimal points. The maximum number of points from this evaluation element is 12. The checking of attendance at exercises will be done by calling out the students at the beginning of each practical. One hour of practical (45 minutes) is equal to 0.2 points

Participation at exercise (5-10 points)

Participation is expected of students by asking questions, drawing microscopic slides and by active studying from the given literature. The active participation of each student at the exercises will be evaluated by 1-10 points. A student must gain a minimum of 5 points. The maximum number of points from this evaluation element is 10.

Continuous knowledge checking (preliminary exams: first 10-16 points; second 10-16 points)

Two preliminary exams will be organized during the course. Both are worth minimum 10 and maximum 16 points. To take the oral exam students must have minimal 10 points from each. In case she/he does not earn enough points, the student has the right to repeat preliminary exam twice again. In this context it is possible to gain 32 points maximum.

Final, oral exam (24-40 points)

The final exam is oral and it consists of revision and knowledge of histological slides (according to the course goals and outcomes). For each slides (there are 5 of them) a student can gain 8 points max. To pass the exam students must gain at least 24 points. The maximum number of points is 40.

The final grade is formed on the basis of the total sum of all five evaluation elements in the course of which the student must gain the minimal number of points from each element. The final mark is expressed quantitatively, by a numeric point-system value and by a grade, adequate to its value in points, from 1 to 5. Students are marked by grade 1 in case they did not master the curriculum successfully, in other words grade 1 means insufficient.

In order to take the final, oral exam a student must attend at least 15 lectures lessons (3 points) and at least 40 practical (8 points), show minimal efforts (5 points) and gain the minimal 20 points from the preliminary exams. On that basis the student can gain a total of 36 points. At the final exam the student must have knowledge by which she/he gains 24 points. In the end the minimal number of points gained is $36 + 24 = 60$.

<i>Points</i>	<i>Gr</i>
do 59	1 (
60-68	2 (
69-76	2 (
77-84	3 (
85-92	4 (
93-100	5 (

	In case a student gains the maximum number of points by attending lectures (6), attending exercises (12) and for participation (10), also adding the number of points she/he gained at the preliminary exam (32), the student gains the maximum of 60 points. Showing knowledge and describing five histological slides the student can earn 40 points more, which makes 100 points in the end and is awarded with an excellent grade (5).		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	AUGHEY, E., F. L. FRYE (2001): Comparative Veterinary Histology with Clinical Correlates. Manson Publishing/The Veterinary Press, London, UK.		
	BACHA, W. J., L. M. BACHA (2012): Color Atlas of Veterinary Histology. 3rd ed. J. Wiley-Blackwell, Chichester, UK	1	
	BANKS, W. J. (1993): Applied Veterinary Histology. Mosby-Year Book, Inc. St. Louis.		
	HYTTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of Domestic Animal Embryology. Saunders Elsevier, Philadelphia.	0	
	McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary Embryology. Blackwell Publishing, Dublin.	1	
	SAMUELSON, D. A. (2006): Textbook of Veterinary Histology. Saunders (W. B.) Co Ltd, London, UK	1	
	PP of lectures and exercises		LMS
2.17. Optional literature (at the time of submission of study programme proposal)	DELLMAN, H.-D. (1993): Textbook of Veterinary Histology. Lea & Febiger. Philadelphia. KERR, J. B. (2000): Atlas of Functional Histology. Mosby, London, St. Louis, Philadelphia, Sydney, Tokyo. MESCHER, A. (2013): Junqueira's Basic Histology: Text and Atlas. 13th ed. Mc Graw Hill Companies, Inc NODEN, D. M., A. DE LAHUNTA (1985): The Embryology of Domestic Animals. Developmental Mechanisms and Malformations. Williams & Wilkins. Baltimore, Hong Kong, London, Sydney. SADLER, T. W. (2006): Langman's Medical Embryology, Lippincott Williams & Wilkins a Wolters Kluwer business. 10th ed. Philadelphia, Baltimore, New York, London, Buenos Aires, Hong Kong, Sydney, Tokyo. YOUNG, B., J. W. HEATH (2000): Wheater's Functional Histology, A Text and Colour Atlas. Churchill Livingstone, Edinburgh, London, New York, Oxford, Philadelphia, St. Louis, Sydney, Toronto.		
2.18. Quality assurance methods that ensure the acquisition of exit competences	Monitoring of attending to lectures and exercises, activities during the exercises, the success of the two preliminary exams and final oral exams		
2.19. Other (as the proposer wishes to add)	It is necessary to supply required mandatory and additional literature.		

INTRODUCTION TO ENGLISH VETERINARY MEDICAL TERMINOLOGY I

1. GENERAL INFORMATION			
1.1. Course teacher	Dubravka Vilke-Pinter, Ph.D.	1.6. Year of the study programme	I
1.2. Name of the course	Introduction to English Veterinary Medical Terminology I	1.7. Credits (ECTS)	1
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	5 hours S + 10 hours E (tutorials)
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	25
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The aim of the course Introduction to English Medical Veterinary Terminology 1 is to introduce students to the specific language register used in the field of veterinary medicine and to develop students' competences to use this language register.</p> <p>The course is designed to introduce the students to principles of word formation in veterinary medical English in order to develop participants' understanding of, and ability to use a wide range of technical terms. Besides providing training in reading scientific and professional literature the course also aims to enable students to achieve general progress in verbal understanding and Information literacy.</p>		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>Process of studying the principles of word formation in technical terminology and of gaining understanding of terms used in various fields of veterinary medicine enables students to identify, acquire and use information provided in scientific and technical literature from the field. Through the learning process, besides gaining specific knowledge of veterinary English students achieve progress in general language skills as well.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>student will be able to:</p> <ul style="list-style-type: none"> recognise veterinary medicine language registrar understand principles of scientific terms formation recognise technical terms from various fields of veterinary medicine independently use a considerable number of scientific terms in a given context have basic understanding of the structure of technical and scientific text 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1st unit: Introduction to veterinary terminology. English as a means of global communication. Different language registers. General English/professional English (English for Specific Purposes - ESP). 2nd unit: Basic features of English in veterinary medicine (specific terminology, specific grammatical structures). 3rd Unit: Analysis of terms pertaining to veterinary profession: Branches of veterinary medicine; Veterinary education worldwide; Career opportunities (veterinary practice, public health, industries) 4thunit: Dictionaries and vocabulary building: Types of dictionaries; Dictionary skills; Key words.</p>		

	Collocations and idioms 5 th unit: Word formation in specialised veterinary medical terminology: Word elements. Prefixation and suffixation. Compounds. 6 th unit: Analysis of specialized terminology in technical texts. Basic features of scientific text. Topic: Characteristics of living beings. 7 th unit: Analysis of specialized terminology in technical texts. Topic: Organisation of living beings: Cells. 8 th Unit: Analysis of specialized terminology in technical texts. Topic: Tissues; Organs; Organs systems; Organism.					
2.6. Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> <u>exercises X</u> <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work			<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory work with mentor <input type="checkbox"/> (other)		2.7. Comments:
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	18%	Research		Practical training	
	Experimental work		Report		Class participation	10%
	Essay		Seminar essay		(other)	
	Tests	32%	Oral exam 10credits		other)	
	Written exam	40%	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Assessment elements					
	Overall grade elements	class attendance class participation continual assessment final exam				
	Class attendance	15 hourly classes	Minimum number of points	Maximum number of points		
			11 coefficient = $18/15 = 1,2$ Students must attend at least 9 out of 15 hourly classes (3 hours S and 6 hours E) to achieve minimum number of points	18		
	CLASS PARTICIPATION		Minimum number of points	Maximum number of points		
		5 coefficient $10/15 = 0,66$ Students must earn at least 5 points out of maximum 10 by performing in-class assignments	10			
Continual assessment		Minimum number of points	Maximum number of points			

			20 Students take a mid-term test Minimum passing score on the test is 20 points	32
	Final exam		Minimum number of points	Maximum number of points
			24 Minimum passing score on the final test is 24 points	40
	Final grade	Overall course grade is based on student's performance in the four assessed elements. Students are entitled to take final exam in case they have earned minimum number of points for each evaluated element		
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Vilke-Pinter, D. (2018). Introduction to English Veterinary Medical Terminology (Part 1) - reading materials - each student receives his/her individual copy of the materials		3	
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Cochran P. (1991). Student's guide to Veterinary Medical Terminology. St. Louis, Mosby.</p> <p>Cox, K. & Hill, D. (2007). Preliminary English for Academic Purposes. Longman.</p> <p>McBride, D.E. (2002). Learning Veterinary Terminology. Mosby.</p> <p>McCarthy, M & O'Dell, F. (2008). Academic Vocabulary in Use. Vocabulary Reference and Practice. Self-study and Classroom Use. Cambridge: CUP.</p> <p>McCormack, J. (2005). English for Academic Study. Garnet Publishing Ltd. Garnet Education.</p> <p>Porter. D & C Black (2007). Check your Vocabulary for Academic English. A & C Black Publishers Ltd.</p>			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continual assessment: in-class writing activities, homework			
2.14. Other (as the proposer wishes to add)				

INTRODUCTION TO VETERINARY

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc Prof Krešimir Severin	1.6. Year of the study programme	1
1.2. Name of the course	Introduction to veterinary	1.7. Credits (ECTS)	1.5
1.3. Associate teachers	Asst Prof Dean Konjević, Asst Prof Gordana Gregurić Gračner	1.8. Type of instruction (number of hours L + S + E + e-learning)	2+6+12+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	10-30
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1, 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Overview of organized veterinary medicine, history of the profession, and career opportunities within the profession.		
2.2. Course enrolment requirements and entry competences required for the course	Terms not specified.		
2.3. Learning outcomes at the level of the programme to which the course contributes	After all lectures attended students will be acquainted with all aspects of veterinary medicine activities and domain of veterinary profession.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Students will be able to:</p> <ul style="list-style-type: none"> define the term, subject and role of veterinary medicine in modern society recognize all aspects of veterinary activities and scope of the veterinary profession interpret the development of science and profession connect the acquire knowledge and professionalization with the development of veterinary disciplines finish plan postgraduate specialist and doctoral studies and training through courses 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Seminars (1) 1. Definition of the term veterinary medicine; meaning and function (Veterinary medicine – definition, function of veterinary medicine in modern society, veterinary medicine as a profession); Development of medicine and veterinary medicine (Pre-ancient times - taming of animals, the beginnings of medicine and veterinary medicine, archaeological and arch zoological findings from the pre-ancient times. The ancient world- preserved findings about medicine and veterinary medicine, Egyptian veterinary papyrus, snake as a symbol of medicine and veterinary medicine, Hamurabi law and regulations, diagnostics, ethics, treatment, Hippocrates and Hippocrates oat, origin of the term veterinarian; Middle ages - animal husbandry and veterinary medicine, hypiatics and marescals and their findings on animal treatment, Arabic medicine (Avicena) and Arab veterinary medicine (Abu Behr ibn Bedar).</p> <p>Seminars (1) 2. Development of veterinary school system (Influence of animal husbandry and veterinary medicine on veterinary education and legislation, first veterinary school founded in 18th ct, founding of veterinary journals and associations, veterinary medicine achievements in 19th and 20th</p>		

	<p>ct.); Development of veterinary medicine in Croatia (First legislative acts, first veterinary literature from Middle Ages, veterinary legislation and veterinary literature from 18th to 20th ct, establishment of veterinary associations important for veterinary medicine development in 19th ct, founding of veterinary high school (20th ct);</p> <p>Seminars (2), Exercises (16) 3. Contemporary student education – integrated undergraduate and graduate study (name of the study, lasting, enrolment conditions, study lasting and organisation, academic degree of doctor of veterinary medicine awarded (VMD); (training for following fields of work: work in primary veterinary medicine, veterinary public health problems solving, protection of human environment, field, clinical and laboratory diagnostics, prevention of animal infectious diseases and zoonoses, programs for developing and improving products of animal origin, improving all kinds of protection of animals and environment, care for ethics and human relations to animals), postgraduate specialist and doctor studies at the Veterinary faculty of Zagreb, veterinary institutions and employment possibilities.</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Attendance at seminars, exercises and writing seminar essay					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.27	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay	0.15	(other)	
	Tests	0.48	Oral exam		(other)	
	Written exam	0.6	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Types of activities	Minimal number of points			Maximal number of points	
	Attending lectures	1			2	
	2% of grade	A student must attend at least 1 lecture lessons to gain the minimal number of points - 1 point (coefficient = 1). In order to gain the maximal number of points – 2 points, the student must attend 2 lectures lessons (coefficient = 1).			4.5% of grade	
	Attending seminars	4			6	
	6 % of grade	A student must attend at least 4 seminar lessons to gain the minimal number of points - 4 points (coefficient = 1). In order to gain the maximal number of points – 6 points, the student must attend 6 seminar lessons (coefficient = 1).				
	Attending filed exercises	8			12	
12 % of grade	During the session of the course a student must attend at least 10 filed					

		exercises lessons in order to gain the minimal number of points – 8 points (coefficient = 0.8). To gain the maximum number of points the student must attend both of field programs (16 lessons) in order to gain the maximum number of points – 12 points (coefficient = 0.8)		
	Participation at seminars	5	10	
	10% of grade	Each student is obliged to create and present the seminar work that is evaluated.		
	Continuous knowledge checking	16	30	
	30% of grade	Written preliminary exams will be organized upon completion of the filed exercises. Preliminary exam consists of 16 questions each referring to seminar materials. From this evaluation element a student can gain minimal 16 points (coefficient = 2) for 15 correct answers, or maximal 24 points for 24 correct answers (coefficient = 2).		
	Final exam	24	40	
40% of grade	A student must gain minimal 36 points from all 5 evaluation elements in order to take the final exam. The final exam is made of written part in form of a test (17 questions each referring to seminar materials. Answers to questions 1 to 15 are valued by a maximum of 2 points while 16-17 with a maximum of 5 points). Regardless to the gained number of points up to the final exam, a student must show the knowledge at this evaluation element as well and gain minimal 24 points (coefficient = 2). The maximum number of points a student can gain at the final exam is 40 points (coefficient = 2).			
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Swope R. E. (2001): Opportunities in Veterinary Medicine Careers. VGM Career Books.		1	
	Hunter, P. (2004): Veterinary Medicine: A Guide to Historical Sources. Ashgate Publishing.		1	
2.12. Optional literature (at the time of submission of study programme proposal)	Riddle, J., E. G. Riggs, R. Simons, C.Gholar (2002.): Veterinarian. Mason Crest Publishers.			

2.13. Quality assurance methods that ensure the acquisition of exit competences	Anonymous student survey about all aspects of teaching.
2.14. Other (as the proposer wishes to add)	

MEDICAL CHEMISTRY

1. GENERAL INFORMATION			
1.1. Course teacher	Assistant professor Luka Krstulović	1.6. Year of the study programme	first
1.2. Name of the course	Medical chemistry	1.7. Credits (ECTS)	5
1.3. Associate teachers	Assistant professor Kristina Starčević	1.8. Type of instruction (number of hours L + S + E + e-learning)	L-18+E-36
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	35
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The objective of this course is that students acquire knowledge of: matter structure, basic inorganic chemical reactions, structures and reactions of organic compounds, main groups of natural compounds and practical knowledge of chemical calculation, qualitative and quantitative analysis. Knowledge acquired by the following syllabus is going to be a base for attending and understanding of courses during the Veterinary medicine studies.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Learning outcomes at the level of the programme: <ol style="list-style-type: none"> 1. Understanding the basic science on which veterinary medicine is based 2. The ability to search the literature, databases and other information sources 3. The ability to design and conduct experiments in the field of veterinary medicine, to interpret results and draw conclusions 4. The ability of use laboratory equipment and make critical analysis of test results 5. The ability of consolidation of the theoretical knowledge and practical skills within the fields of veterinary medicine 6. The ability of conduct independent research and work in team 7. The ability of presenting the results – oral and in writing 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Learning outcomes at the level of the course: Ater successful completion of the course the student will be able to: <ol style="list-style-type: none"> 1. apply basic chemical reactions and physicochemical processes; 2. compare the structure and properties of simple organic compounds and complex biologically important molecules; 3. connect the relationship of chemical structure of a molecule and its physical and chemical properties; 4. independently use basic methods of analytic chemistry for quantitative and qualitative analysis; 5. apply chemical calculations to solve the tasks. 		
2.5. Course content broken down in detail by	Lectures		

weekly class schedule (syllabus)	<ol style="list-style-type: none"> 1. Introduction lecture: role of chemistry and biochemistry in veterinary medicine, matter structure; atoms, molecules, electronegativity, ionic and covalent bonds. 2. Dispersed systems: suspensions, colloids, solutions, aqueous solutions, hydrogen bonds, electrolytes, diffusion, osmosis, colligative properties); 3. Acids and bases: pH, buffer solutions, biological buffers, reaction energy: activation energy, endothermic and exothermic reactions, catalysts. 4. Alkanes, alkenes, alkynes, isomers and isomerism: structural and stereoisomers 5. Oxygen-containing organic compounds: alcohols, ethers, aldehydes, ketones, carboxylic acids and derivatives. 6. Nitrogen-containing organic compounds: amines, heterocyclic compounds, alkaloids. 7. Carbohydrates: classification and stereoisomerism, monosaccharides, oligosaccharides and polysaccharides. 8. Lipids: structure, classification, saponification, amino acids: structure and properties. 9. Proteins: structure, enzymes, coenzymes, nucleic acids: purine and pyrimidine bases, nucleosides, nucleotides. <p>Laboratory exercises:</p> <ol style="list-style-type: none"> 1. Qualitative chemical analysis: cations and anions 2. Solution preparation and optical methods 3. Quantitative chemical analysis: acidimetry and alkalimetry: 4. Experimental pH determination 5. Quantitative chemical analysis, redox reactions: iodometry 6. Qualitative and quantitative chemical analysis: determination of organic compounds <p>Exercises in the lecture room:</p> <ol style="list-style-type: none"> 1. Chemical calculations- Basis of chemical calculations 2. Chemical calculations- Composition of solutions I 3. Chemical calculations- Composition of solutions II 4. Chemical calculations- Neutralisation reactions 5. Chemical calculations- Dissociation, pH, buffer I 6. Chemical calculations- Dissociation, pH, buffer II 7. Chemical calculations- Redox reactions I 8. Chemical calculations- Redox reactions II 9. Chemical calculations- Colligative properties 					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities	<ol style="list-style-type: none"> 1. attending lectures 2. attending exercises 3. participation at exercises 					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal	Class attendance	0.9	Research		Practical training	
	Experimental work	0.5	Report		Activity	1.6
	Essay		Seminar essay		(other)	

to the ECTS value of the course)	Tests		Oral		(other)	
	Written exam	2	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>Lecture attendance There are 18 lecture lessons. A student must attend 1 lesson to gain 0.33 points. The maximum number of points is 6 (18 lessons) and the minimum number of points is 3 (9 lessons).</p> <p>Exercise attendance Exercises in the lecture room: there are 18 exercise lessons in the lecture-room (9 programmes). Each programme (two exercise lessons), is worth 0.33 points. Student must attend 6 programmes (12 lessons) in order to gain minimum of 4 points. Maximal number of points: 6 (18 lessons – 9 programmes). Minimal number of points: 4 (12 lessons – 6 programmes).</p> <p>Laboratory exercise: there are 18 exercise lessons in the lab (6 programmes). A student must attend 4 programmes (12 lessons) in order to gain minimal 4 points. Maximal number of points: 6 (6 programmes) Minimal number of points: 4 (4 programmes).</p> <p>Exercise activity Lab exercises: a student must solve a task from an exercise (programme) and present a report in order to get a signature for the exercise. Each correctly done and signed exercise is worth 1.67 points. A student must gain minimal 5 points. The maximal number of points: 10 points (6 programmes – coefficient 1.67). The minimal number of points: 5 (3 programmes).</p> <p>Continuos knowledge assessment Exercises in the lecture room: There will be 2 preliminary exams, organised during the sessions. Each preliminary exam is worth 8 points (combined 16 points). A student must gain minimal 10 points. For students who do not gain the minimal number of points makeup preliminary exam will be organised. The maximum number of points: 16 (2 preliminary exams). The minimal number of points: 10. A preliminary exam from attended lectures will be organized during the sessions. The exam consists of 8 questions and each correct answer is worth 2 points. A student can gain maximal 16 points (8 correct answers), and she/he must gain a total of minimal 10 points (5 correct answers). A student who does not gain the minimal 10 points has a right to take a makeup preliminary exam. Preliminary exams: the maximum number of points: 16, the minimal number of points: 10</p> <p>Final exam In order to take the final exam a student must gain the minimal number of points from each evaluation element, i.e. the total of minimal 36 points from the first four evaluation elements. The final exam is in written form and it consists of 20 questions. Each correct answer is worth 2 points. A student can gain 40 points max. (20 correct answers). The minimal number of points a student must gain at the final exam is 24 (12 correct answers). The maximum number of points: 40. The minimal number of points: 24.</p>					
	2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media
1. F. A. Bettelheim, W. H. Brown, J. March (2004): Introduction to General, Organic, and Biochemistry, Thomson.			1	No		

	2. M. S. Silberberg (2000): Chemistry, The Molecular Nature of Matter and Change, McGraw Hill.	1	No
	3. F. A. Carey (2003): Organic chemistry, McGrawHill, New York	5	Yes
	4. J. G. Smith (2006): Organic chemistry, McGrawHill, New York	5	No
	5. Stolić, I. (2013): Chemical calculation I, Veterinary faculty, Zagreb	10	Yes
	6. Krstulović, L. (2013): Chemical calculation II, Veterinary faculty, Zagreb	10	Yes
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Student survey		
2.14. Other (as the proposer wishes to add)			

PHYSICAL EDUCATION

1. GENERAL INFORMATION			
1.1. Course teacher	Saša Čuić, B.A. – Senior Lecturer	1.6. Year of the study programme	First year
1.2. Name of the course	PHYSICAL EDUCATION	1.7. Credits (ECTS)	1
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	30 hours per semester of practical work
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	25
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Aims of PHYSICAL EDUCATION AND COLLEGIATE SPORT: (1) learning new conventional motor knowledge, (2) improve basics theoretical and practical kinesiology knowledge, (3) fortify interest, antropological characteristics and motor informations, (4) prevent earlier tumble characteristics, abilities and motor knowledge, couse for want of physical exercises, (5) promote sports culture and (6) promote social communications. Knowledge of structures, rules, training process, specific select kinesiology activities: swimming, basketball, football, volleyball, handball, dances, aerobics, badminton, skating, skiing, squash, sports on the water (sailing, paddle), riding.		
2.2. Course enrolment requirements and entry competences required for the course	Full-time inscription semester.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Possibility changes morphological characteristics, motor and functional abilities; training students for independent physical exercises; laws of medical culture; quality nutrition.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	-learning new conventional motor knowledge, -improve basics theoretical and practical kinesiology knowledge, -fortify interest, antropological characteristics and motor informations -promote sports culture		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Swimming, basketball, football, volleyball, handball, dances, aerobics, badminton, skating, skiing, squash, sports on the water (sailing, paddle), riding.		
2.6. Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops xx <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:

2.8. Student responsibilities	Compulsory full-time appearance and active participate. Possibility of writing seminar work of interest area (kinesiology science) students, in case incomplete work of compulsory programme. Possibility participate at University Championships in 23 male and female sports, cross competition and visiting sport events.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	xx	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests		Oral exam		(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Initially knowledge students check over interest for some programme, there is no examination, by questionnaire students pursue quality of work course instructors. Accomplishment min. 80% of whole education in semester, students acquire right for signature of professor.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Literature is not obliged. Recommendation: Heimer, S. (2003). Promotion medical-preventive physical activity in Croatia. Sport for all 21 (35), 3-4. Mišigoj-Duraković, M., Z. Duraković, S. Xiukun, L. Petrinović (2003). Physical exercise in prevent of chronicle aninfection diseases. Sport for all. 21 (33-34), 25-28. Bartoluci, M., D. Omrčen (2003). Promotion as an element of marketing mix in sport and sport tourism: The Croatian Experience. Kinesiology, 35(1), 72-84.					
2.12. Optional literature (at the time of submission of study programme proposal)	Depending on interest area of students: e.g. VOLLEYBALL: Janković, V., N. Marelič (2003). Volleyball for all. Zagreb, authors edition. Officially regulations of volleyball (2004). Croatian volleyball Union, Zagreb. Marelič, N., V. Janković (1996). Vooleyball technics. Zadar, Cesar press. e.g. SWIMMING: Volčanšek, B. (1996). Sportive swimming (Manual). Faculty of Kinesiology, Zagreb. Fina-regulations of swimming (2002). Assembly judges Croatian swimming Union, Zagreb. Volčanšek, B. (2002). Essence of swimming Manual). Faculty of kinesiology, Zagreb. Szabo, I. (2002). Method exercises for development of swimming technics (Master's thesis). Faculty of kinesiology, Zagreb.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Verification knowledge and skills and participate on education pursues at pedagogic work with students, evidence active sports and medical status pursues at consultations with students, evidence and valuing results on University Championships in 23 male and female sports pursues at consultation with students and on the sport arenas, where competition are preserve.					
2.14. Other (as the proposer wishes to add)						

PHYSICS AND BIOPHYSICS

1. GENERAL INFORMATION			
1.1. Course teacher	Pašić Selim	1.6. Year of the study programme	1.
1.2. Name of the course	Physics and Biophysics	1.7. Credits (ECTS)	5
1.3. Associate teachers	Nato Popara	1.8. Type of instruction (number of hours L + S + E + e-learning)	16 + 0 + 38
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of the course is to provide and explain biological processes on molecular level on the basis of the same fundamental physical laws.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> -Distinguish mechanisms of biological systems based on knowledge of the fundamental laws of physics with using simple models. -Clarify the effects of external energy sources on an animal organism. -Connect the laws of physics with the basic principles of diagnostic methods. -Handled by simply measuring instruments. -Analyze the measured data and process them using a simple statistical procedure. 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> -Explain the physical basis of biological processes at the molecular level -Distinguish mechanisms of biological systems based on knowledge of the fundamental laws of physics with using simple models. -Describe ways to transfer energy and matter within the body and in its interaction with the environment. -Clarify the effects of external energy sources on an animal organism. -Connect the laws of physics with the basic principles of diagnostic methods. -Handled by simply measuring instruments. -Analyze the measured data and process them using a simple statistical procedure. 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Introduction (Introduction. International Systems of Units (SI) and units. Errors in measurements. Some important mathematical functions. Vectors.) (2 hours of lectures)</p> <p>Mechanics (Velocity and acceleration (linear and angular). Newton's laws. Centripetal and centrifugal force. (Ultra)centrifuge. Gravitational force. Friction. Work. Power. Energy. Conservation of energy law. The momentum. Lever. Centre of gravity. Equilibrium.) (2 hours of lectures)</p> <p>Fluids (Surface tension. Density of matter. Hydrostatic and hydraulic pressure. Lift. Archimedes Principle. Viscometers. Bernoulli's Equation and blood flow. Ideal Gas. Equation of state of an ideal gas. Dalton laws. Atmospheric pressure and its measurement.) (2 hours of lectures)</p>		

	<p>Heat (Temperature and molecular motions. Laws of thermodynamics. Thermal expansion of solids. Heat capacity. States of matter. Heat conduction. Animal and its thermal environment. Liquefaction of natural gas. Cooling devices) (2 hours of lectures)</p> <p>Oscillations and Waves (Resonance. Wave equation. Interference of waves. Transverse and longitudinal waves. Waves. Harmonic oscillator.)</p> <p>Acoustics (Sound as longitudinal wave. Connection of physical quantity and their physiological effects: Intensity of sound wave - volume of the sound, frequency of sound wave - height of the sound. Ultrasound echo effect and its use in ultrasound diagnostic.) (2 hours of lectures)</p> <p>Optics (Index of the refraction and dispersion. Lenses and their characteristic points. Part of a microscope. Construction of an image in the eye. Dispersion of the light. Beer-Lambert law of the absorption. Spectral analyse. Polarization of an electromagnetic wave. Features of infrared radiation. Blackbody radiation. Spectrum of electromagnetic radiation. Photoelectric effect. Dual nature of the light.) (2 hours of lectures)</p> <p>Electricity (The law of the electric charge conservation. Conductors and insulators. Coulomb law. Electric field. Electric potential. Capacity. Electric current. Ohm's Law. Kirchhoff's rules. Resistance law. Joule's Law. Electrolytes and their conductivity. Sources of the electromotive force. Model of biological membrane and potential of living cells. Resistivity of animal body. Biological potential (Nerst equation). Model of biological membrane. Conduction of the electric pulse along nerves. Electric resistance of human body.)</p> <p>Magnetism (Magnetic field. Magnetic flux. Magnetic inductivity and permeability. Lorentz's Law. Electromagnetic induction.) (2 hours of lectures)</p> <p>Structure of the matter (Elementary particles. Bohr model of the atom. Structure of the atom, atomic nuclei and isotope. Pauli's principle. Absorption, stimulated and nature emission of radiating. Laser. X-ray tube. Radioactivity and types of radioactive radiation. Law of radioactivity. Radioisotopes. Ionisation radiation ($\alpha, \beta, \gamma, n, x$) and their penetrability. Measuring of ionization radiation. NMR imaging.) (2 hours of lectures)</p> <p>Qualitative and numerical exercises (12 exercises)</p> <p>Laboratory exercises (26 exercises)</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,9	Research		Practical training	0,5
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	1,6	Oral exam		(other)	
	Written exam	2,0	Project		(other)	

	Activity	Minimum Credit	Maxima credits
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures (15 sati)	3.00 $3/0.40 \approx 8$ (coefficient 0,40) Students have to attend minimum of 8 hours of lecture to gain minimum of 3.00 credits.	6.00 $6/15=0.4$ (coefficient 0.40)
	Attending exercises (30 sati)	8.00 $8/0.40=20$ (coefficient 0.40) Students have to attend minimum 20 hours of exercise to gain minimum credits (8.00).	12.00 $12/30=0.4$ (coefficient 0.40)
	Activity on exercises ^a	5.00 $5/0.1923=26$ (coefficient 0.1923) Students have to gain 26 units for minimum 5.00 credits	10.00 $10/52=0.1923$ (coefficient 0.1923)
	Continues exams ^b	20.00 a) Measure units' continuous exam. The minimum credits is 4.00 $4/0.4=10$ (coefficient 0.4) Preliminary exam. Minimum of credits is 16.00 $16/0.4=40$ (coefficient 0.4)	32.00 a) Measure units' continuous exam. The maximum of credits is 6.00 $6/15=0.4$ (coefficient 0.4) b) Preliminary exam. Maximum of credits is 26.00. $26/65=0.4$ (coefficient 0.4)
	Final exam ^c	24.00 $24/1=24$ (coefficient 1) Student have to gain at least: a) 6.00 credits from numerical tasks. b) 18.00 credits from theoretical tasks for minimum 24.00 credits.	40.00 $40/40=1$ (coefficient 1) Student can gain the maximally: a) 10.00 credits from numerical tasks. b) 30.00 credits from theoretical tasks for maximum 40.00 credits.
	TOTAL:	60.00	100.00
	^a 52 units consist of: a) Preparation for lab exercise =1 unit (13 preparations x 1 unit = 13 units) b) Finishing task and processing of the data give 3 units (13 tasks x 3 units = 39 units) ^b Units consist of: a) preliminary exam in labs (13 exercises x 5 tasks = 65 units) b) continuous exam from measure units (15 tasks x 1 unit = 15 units) ^c 40 units are consisted of: a) numerical task (10 tasks x 1 unit = 10 units) b) theoretical tasks (30 tasks x 1 unit = 30 units)		

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	S. Pašić: Laboratory exercises manual for students of veterinary medicine Web page http://www.fizika.vef.unizg.hr/	0	Internet
	C. Hilyard, H.C. Biggin: Physics for Applied Biologists, Hodder & Stoughton Educational (December 1, 1977)	0	Internet
	Instructions and forms for laboratory exercises, internal script	50	
2.12. Optional literature (at the time of submission of study programme proposal)	Russell K. Hobbie, Bradley J. Roth: Intermediate Physics for Medicine and Biology, Springer, 2006.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading and evaluating student work in class and at the final exam		
2.14. Other (as the proposer wishes to add)			

ZOOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Full professor Josip Kusak, DVM, PhD	1.6. Year of the study programme	The first year
1.2. Name of the course	Zoology	1.7. Credits (ECTS)	5.5
1.3. Associate teachers	Full professor Ksenija Vlahović, DVM Full professor Maja Popović, DVM, PhD Associate professor Tomislav Gomerčić, DVM, PhD Assistant professor Daniel Špoljarić, DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	L=15; S=20; E=40
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate studies	1.9. Expected enrolment in the course	30
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2 i.e. 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Through the course, students do acquire crucial knowledge and understanding about animal kingdom, which is per se the essence of the study of veterinary medicine. The goal of teaching this course is to acquaint the students of Veterinary medicine with the basic rules of functioning of living world and its relation to the nonliving environment. It enables understanding of the wide range of processes from the transport of matter and energy from the level of cell and organism to the populations of all taxonomic groups of fauna and flora, and their relations on the level of ecosystem and entire biosphere. This is the precondition for any logical understanding of other courses from morphology and physiology to pathology, therapy and prevention of diseases. Additional needs for this knowledge emerge from the ever broadening of spectrum of species treated in the veterinary medicine, an either as patients, husbandry, hunting, collection, or human consumption in any form. Regulations on environmental matters (like various waste disposal) and on international trade with living organisms are also getting more complex and strict.		
2.2. Course enrolment requirements and entry competences required for the course	The subject Zoology is at the beginning of the Veterinary medicine study and the only precondition is that a student can understand, speak and write in English.		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - taxonomically classifying every animal to the phylum level, while classifying mammals to the order level - interpret basics of evolutionary processes - explain the structure and role of cell parts during cell division - distinguish types of reproduction, ways and processes of fertilization 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - compare stages of embryonic development of invertebrates and various groups of vertebrates - knowing abiotic and biotic ecological factors and mechanisms of their interactions - distinguish biomes and phases of community successions 		

	- classifying types of pollutants and basic mechanisms of their interactions in ecosystems		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Definitions (systematics, taxonomy, classification), Systematic categories and binary nomenclature (Linne), Phylogeny and evolution (Darwinism); Phylogenetic tree (6 Kingdoms of living organisms: Prokaryotes, Archea, Protista, Animalia, Plantae, Fungi); Eukaryotes, Cell biology: Features of eukaryote cell. Comparison with prokaryotic cell. Nucleus and nucleus membrane importance. Cell organelles evolution, structure and function: cell membrane, nucleus, endoplasmic reticulum, mitochondrion, lysosomes, microtubule, ribosomes, nucleolus, centrosome. Animal and plant cell distinctions. Chromosomes: structure and cycle. Protozoa: Sarcodina, Mastigophora, Ciliata, Eusporozoa, Cnidosporidia. Evolution of metazoa: Multicellular animals' appearance and development. Parazoa (Porifera, Placozoa). Cell organelles and whole cells specialization. Acelomata: Cnidaria, Platyhelminthes, Nematelminthes. Non vertebrate Celomata and coelom: coelom evolution, structure and function. Pisces: Cyclostomata, Placodermi, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves, Mammalia: Characteristics and division. Mammalia: Orders: Insectivora, Dermoptera, Chiroptera, Edentata, Pholidota, Primates, Rodentia, Lagomorpha, Cetacea, Carnivora, Tubulidentata, Hyracoidea, Proboscidea, Sirenia, Perissodactyla, Artiodactyla. Cell divisions: Cell divisions types – somatic cells division - mitotic division – reductive division: meiosis I and II, (Crossing-over, oogenesis - spermatogenesis, spermiogenesis) – endomitotic division. Chromosome cycle in u mitosis and meiosis. Polykariontia, polyploidy, polyteny – gigantic chromosomes. Description and role of each cell division type. Phases analysis. Division result. Sex cells: Gametes or sex cells (evolution of sex cells), Spermatozoa and egg (structure and function). Eggs classification by quantity and location of yolk content at all animals by groups). Reproduction, types and purpose. Nonsexual and sexual reproduction (hermaphrodite, diecic animals). Advantages of sexual reproduction. Parthenogenesis, androgenesis. Fertilization (internal, external), monospermy, polyspermy (fertilization duration), Phases of fertilization: singamy, cariogamy, activation of egg. Embryogenesis, ontogenesis, phylogenies. Comparative developmental embryology: Cleavage or segmentation. Embryonic development phases. Germ layers. Metamorphosis. Neotenia. Prostomia, deuterostomia. Cleavage types: Total (holoblastic) equal or unequal. Partial (meroblastic), discoidal and superficial. Gastrulation: invagination, involution, epiboly, delamination. Chordo-mesodermal roof. Neurula, Tubulation. Embryonal sheets (birds and reptiles): yolk sac, chorion, amnion, allantois and allanto-chorion (evolution, structure and function). Germ layers derivatives. Ecology, Living and non living matter relations. World strategy of nature conservation. Basic ecologic terminology: biosphere, bio-cycle, biomes, ecosystem, biotope (habitat, microhabitat), biocenosis, ecological niche, ecological spectrum, ecosystem homeostasis, Ecological pyramids of numbers, biomass and energy (plants, herbivores and carnivore); Energy in ecosystem. Abiotic factors: Geochemical mineral cycles, light, heat, water, pH, pressure. Biotic factors: Abundance, sociability, dominancy, activity range, fertility, mortality, biotic potential, age structure, population dynamics. Intra- and inter-specific relations (neutralism, competition, predation, parasitism, mutualism). Successions and climax of biocenoses, Order of population replacement, Dependences and final population types. Biomes: Aquatic and terrestrial: rain forests, deciduous forests, taiga, tundra, grasslands, chaparral, deserts, ecotone. Biodiversity: Definition, evolution and importance. Methods of ecological research: Qualitative and quantitative methods. Influences of man on ecological equilibrium: Direct (resource exploitation and constructional changes) and indirect – pollution (types: organic, un-organic, dust, radioactive, thermal pollution /water, global warming/, acid rains, ozone holes, light pollution, noise), genetically modified organisms, monocultures. Field exercises in Zoological garden, National park Risnjak, solid waste dump Jakuševac, and Maksimir park. Laboratory exercises in systematics and cell and evolution biology.</p>		
	<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> independent assignments	2.7. Comments:

2.6. Format of instruction:	<input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor (in the case of having less than ten students enrolled) <input type="checkbox"/> (other)																		
2.8. Student responsibilities	Attending lectures, seminar, field work and lab exercises. Preparing for lab and field work from materials on LMS. Preparing, presenting and defending one seminar.																			
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)		0.99	Research		Practical training															
	Experimental work		Report		Activity	0.55														
	Essay		Seminar essay		(other)															
	Tests	1.76	Oral exam	2.2	(other)															
	Written exam	2.2	Project		(other)															
2.10. Grading and evaluating student work in class and at the final exam	<p>According to Bologna approach of study process, the work of an student will be evaluated by the following means:</p> <p>For attending a total of 16 lecture hours a student can gain 3 to 6 points, thereby each lesson is worth 0.4 point.</p> <p>For attending a total of 20 seminar hours a student can gain 4 to 6 points, thereby each lesson is worth 0.3 point. A condition is to write one seminar work.</p> <p>For attending a total of 40 exercise hours a student can gain 4 to 6 points, thereby each lesson is worth 0.15 point.</p> <p>A student can be asked or she/he can answer on her/his own at least 6 times. Each correct answer is worth 1.67 points. The student can gain 5 to 10 points. There will be twelve short tests each containing 10 questions, at the beginning of lab exercises. In case a student does not attend the lesson and does not gain 120 units (e.g. she/he gained only 100 or 110 units), the unit value will be recalculated from the number he gained. A student can gain 20 to 32 points, and the unit value for each correct answer is 0.27 (for all 12 tests).</p> <p>The final written exam consist of 50 questions, where a student can gain 15 to 20 points. Each question is worth 0.5 accounting units. The oral exam contains three questions for 9 to 15 points. Each question is worth 5 accounting units. The final student's score is calculated according to the following:</p> <table border="1" data-bbox="435 1391 1401 1637"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>						Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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2.12. Optional literature (at the time of submission of study programme proposal)	Mader, S. M., (2004) Biology. McGraw-Hill, USA, 952 pp. Pimac, R. B. (1995): A primer of conservation biology. Sinauer Associates Inc, Massachusetts, USA
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous oral and written checking of acquired knowledge
2.14. Other (as the proposer wishes to add)	

LIST OF OBLIGATORY SUBJECTS - 2nd STUDY YEAR

Obligatory Subjects - 2nd study year

Anatomy with Organogenesis of Domestic Animals III
Animal Breeding and Production
Applied Animal Nutrition
Basic Animal Nutrition
General Microbiology
Hygiene and Housing of Animals
Introduction to English Veterinary Medical Terminology II
Molecular Biology and Genomics in Veterinary Medicine
Physical Education
Physiology of Domestic Animals I
Physiology of Domestic Animals II
Veterinary Immunology

ANATOMY WITH ORGANOGENESIS OF DOMESTIC ANIMALS III

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Martina Đuras	1.6. Year of the study programme	2 nd year, 3 rd semester
1.2. Name of the course	Anatomy with organogenesis of domestic animals III	1.7. Credits (ECTS)	5.5
1.3. Associate teachers	Prof. Srebrenka Nejedli; Prof. Tajana Trbojević Vukičević; Assist. Prof. Mirela Pavić; Assist. Denis Leiner, DVM; Assist. Kim Korpes, DVM; Assist. Magdalena Kolenc, DVM; Assist. Nikolina Škvorc, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 + 63 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	VEF-LMS
2. COURSE DESCRIPTION			
2.1. Course objectives	The course presents the gross anatomy of domestic animals with embryonic development of organs and organic systems to veterinary medicine students in order to ensure basic knowledge for other disciplines such as physiology, pathology and clinical courses.		
2.2. Course enrolment requirements and entry competences required for the course	Completed courses "Anatomy with organogenesis of domestic animals I" and "Anatomy with organogenesis of domestic animals II".		
2.3. Learning outcomes at the level of the programme to which the course contributes	Following successful completion of the course, students will be able to apply acquired knowledge on gross anatomy and development of the head and neck of domestic mammals and basic gross anatomy of domestic birds during preclinical and clinical courses.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Following successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> 30 list and describe major anatomical structures of the head and neck of domestic mammals and basic gross anatomy of domestic birds 31 explain the development of the structures of the head and neck 32 apply anatomical nomenclature 33 skilled communicate anatomical information 34 utilize dissection skills 		

2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures: 1. Principles of the skeleton of the head and cervical spine (1 hour), 2. Muscles of the head and neck (2 hours), 3. Mouth, salivary glands, pharynx and the esophagus: structure and development (3 hours), 4. Upper respiratory tract, larynx and trachea: structure and development (2 hours), 5. Development of the nervous system (1 hour), 6. Brain, spinal cord and cranial nerves (2 hours), 7. Eye: structure and development (1 hour), 8. Ear: structure and development (1 hour), 9. Basic gross anatomy of domestic birds (2 hours)</p> <p>Practicals: 1. Cervical vertebrae (2 hours), 2. Skeleton of the head (8 hours), 3. Regions, fasciae and skin muscles of the head and neck (3 hours), 4. Muscles of the head (4 hours), 5. Muscles of the neck and nuchal ligament (6 hours), 6. Ventral neck region and parotid region (3 hours), 7. Buccal region (3 hours), 8. Masseteric region and temporomandibular joint (3 hours), 9. Mouth (3 hours), 10. Pharynx (3 hours), 11. A. carotis externa (2 hours), 12. Intermandibular region (3 hours), 13. External nose and nasal cavity (3 hours), 14. Larynx (3 hours), 15. Eye (4 hours), 16. Vestibulocochlear organ (3 hours), 17. Brain (3 h), 18. Basic gross anatomy of domestic birds (4 hours).</p>					
2.6.Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities	Students are expected to attend lectures and dissection exercises and prepare cadavers according to course instructions.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.99	Research		Practical training	0.55
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	1.76	Oral exam	2.2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimum number of points		Maximum number of points	
	Lecture attendance		3		6	
	Practical training attendance		8		12	
	Participation in the practical training		5		10	
	Tests		20		32	
	Oral exam		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	

	KÖNIG, H. E., H.-G. LIEBICH (2007): Veterinary anatomy of domestic mammals, Textbook and color atlas. 3 rd Ed. Schattauer, Stuttgart, New York		
	DYCE, K. M., W. O. SACK, C. J. G. WENSING (2010): Textbook of veterinary anatomy. 4 th Ed. Saunders Elsevier, Philadelphia.	4	
	DONE, S. H., P. C. GOODY, S. A. EVANS, N. C. STICKLAND (2009): Color atlas of veterinary anatomy. Volume 3. The dog and cat. 2 nd Ed. Mosby Elsevier, Edinburgh, London, New York.	1	
	EVANS, H. E., A. de LAHUNTA (2010): Guide to the dissection of the dog. 7 th Ed. Saunders Elsevier. Philadelphia.		
	McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary embryology. Blackwell Publishing, Dublin.		
2.12.Optional literature (at the time of submission of study programme proposal)	NICKEL, R., A. SCHUMMER, E. SEIFERLE (1986): The locomotor system of the domestic mammals. Volume I. Verlag Paul Parey, Berlin, Hamburg. NICKEL, R., A. SCHUMMER, E. SEIFERLE (1979): The Viscera of the Domestic Mammals. Volume II. 2 nd revised Ed. Verlag Paul Parey, Berlin, Hamburg. NICKEL, R., A. SCHUMMER, E. SEIFERLE (1981): The circulatory system, the skin, and the cutaneous organs of the domestic mammals. Volume III. Verlag Paul Parey, Berlin, Hamburg. NICKEL, R., A. SCHUMMER, E. SEIFERLE (1977): Anatomy of the Domestic Birds. Volume V. Verlag Paul Parey, Berlin, Hamburg. EVANS H. E., A. De LAHUNTA (2012): Miller's anatomy of the dog. 4 th Ed. WB Saunders Company, Philadelphia, London. SCHALLER, O. (2007): Illustrated veterinary anatomical nomenclature. 2 nd Ed. Ferdinand Enke Verlag, Stuttgart. HYTTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of domestic animal embryology. Saunders Elsevier, Philadelphia. SADLER, T. W. (2006): Langman's medical embryology, Lippincott Williams & Wilkins a Wolters Kluwer business. 10 th Ed. Philadelphia, Baltimore, New York.		
2.13.Quality assurance methods that ensure the acquisition of exit competences	Grading of active participation in the practical training, two written tests, final oral exam		
2.14.Other (as the proposer wishes to add)			

ANIMAL BREEDING AND PRODUCTION

1. GENERAL INFORMATION			
1.1. Course teacher	Anamaria Ekert Kabalin, PhD, Full Professor	1.6. Year of the study programme	2nd
1.2. Name of the course	Animal Breeding and Production	1.7. Credits (ECTS)	7
1.3. Associate teachers	Velimir Sušić, PhD, Full Professor (permanent) Sven Menčik, PhD, Assistant Professor Maja Maurić, PhD, Assistant Professor Ivan Vlahek, VMD Aneta Piplica, VMD	1.8. Type of instruction (number of hours L + S + E)	34 L + 14 S (4 e-learning) + 42 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	20
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	4,4%
2. COUSE DESCRIPTION			
2.1. Course objectives	The objective of the course Animal breeding and production is to teach students of veterinary medicine how to evaluate and improve genetic basis of animals. Special attention is focused on genotype-phenotype characteristics which have influence on quality and quantity of animal products, than to the characteristics of animal resistance to diseases and animal organism -environment interactions.		
2.2. Course enrolment requirements and entry competences required for the course	Undergraduate courses: Basic Statistics in Veterinary Medicine and Animals Breeds Characteristics		
2.3. Learning outcomes at the level of the programme to which the course contributes	Material is divided into three parts that first allow student to acquire knowledge about animal species as a result of its genetic particularities and specific environment. Then there are lessons that explain how to estimate genetic basis of particular traits and describe breeding methods that enable us to improve this traits. Finally, in the third part students learn about different production systems and the way of using animal genetics to improve quantity and quality of production and in the same time how production influence on animal health.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully completion of the course students will be able to: <ul style="list-style-type: none"> - understand the role of genetic basis in different ways of breeding and exploiting animals - apply different methods to improve the genetic basis of animals with respect to specific breeding traits - identify various animal production systems - gather animal health and production data 		

	<ul style="list-style-type: none"> - analyse animal health and production data - setting the goals in cooperation with farmer - control advancement according to set goals 	
<p>2.5.Course content broken down in detail by weekly class schedule (syllabus)</p>	Methodological unit / course content	Class schedule ("L" lectures + "S" seminars + "E" exercises intramural + "Ef" exercises field)
	<p>Animal breeding - introduction, definition and importance. Animal breeding traits - measurability and economic value. General and special animal breeding traits. Inheritance and variability of animal breeding traits. Phenotype equation. Phenotype/genotype of qualitative and quantitative traits. Phenotypic variability of breeding traits. Genotype determination of qualitative and quantitative breeding traits. Introduction to the various uses of animals - production, work, experiments, pets, sports, recreation. Importance and basic principles of animal production. General and special traits in breeding of cattle, sheep, goats, pigs, poultry, horses and dogs.</p>	L 3 + E 4
	<p>Introduction to genetic improvement of animals by different breeding methods. Breeding population - genetic and genotype structure. Animal improvement by new gene combinations and/or gene frequency change. Methods of animal breeding – pureblood, crossbreeding, bastarding. Biotechnological methods in animal improvement – artificial insemination, multiple ovulation and embryo transfer, cloning, semen sexing, gene tests. Improvements of animal populations - breeding programs, exhibitions, licensing, regionalization, implementation of legal regulations, scientific and professional literature.</p>	L 4 + E 4
	<p>Introduction to genetic improvement of animals by selection. Selection of animals with regard to qualitative traits. Natural and artificial selection of animals. Methods of selection. The frequency of genotypes and genes in the animal populations. The equilibrium of genotypes and genes in the population. Factors that can change the frequency of genotypes and genes in the population. Harmful genes - degeneration, predisposition to diseases. Major genes – muscular hypertrophy, fertility.</p>	L 4 + E 2
	<p>Selection of animals with regard to quantitative traits. Causes of variability of quantitative traits. Statistical indicators in the estimation of quantitative traits variability. Relationship and repeatability of quantitative traits. Quantitative traits and</p>	L 4 + E 4

	<p>environmental impact. Heritability. Setting the selection criteria. Selection Differential. Assessment of the effect of selection. Factors that influence effect of selection: herd renewal, generation interval, crossing effects.</p>	
	<p>Introduction to evaluation of the breeding value - definition, presentation and interpretation of the breeding value. Differences between genotype and breeding value. Sources of data and the accuracy of the estimation of the breeding value. Methods for estimation of breeding values. Breeding value in different animal species.</p>	L 4 + E 4
	<p>Production systems in cattle breeding. Technological basics in the production of cow's milk. Technological basics in the production of beef meat. Herd health and production management in cattle farms.</p>	L 3 + S 2 + E 2 + E(f) 8
	<p>Production systems in sheep and goat farming. Technological basics in the production of sheep and goat milk. Technological basics in the production of sheep and goats meat. Herd health and production management in sheep and goat farms.</p>	L 3 + S 2 + E 1
	<p>Production systems in pig breeding. Technological basics in the production of pork. Herd health and production management in pig farms.</p>	L 2+ S 2 + E 1
	<p>Production systems in poultry. Technological basics in the production of chicken meat. Technological basics in the production of chicken eggs for food. Production of other poultry species. Herd health and production management in poultry farms.</p>	L 2+ S 2 + E 2 + E(f) 3
	<p>Training and use of horses. Organization of horse mating, parturition, foal and hare raising. Different use of horses.</p>	L 2 + E 2 + E(f) 1
	<p>Training and exploitation of dogs. Reproduction, training of young dogs. Different use of dogs. The basics of dogs training. Training of official and therapeutic dogs. Good breeding practice in dogs. Raising cats. Reproduction, breeding and raising young cats. Good breeding practice in cats.</p>	L 2 + E 3
	<p>Breeding and exploitation of laboratory animals and rabbits. Mating and raising of laboratory mice and rats.</p>	L 1 + E 1

	Basics of breeding and raising of the most common cage pets.					
	Programs to improve the genetic base of different animal species. Breeding programs. Breeding programs in Croatia - cattle, sheep and goats, pigs, poultry and horses. Breeding program for dogs. Breeding program for cats.		S 6 (4 e-learning)			
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures	<input checked="" type="checkbox"/> independent assignments		2.7.Comments:		
	<input checked="" type="checkbox"/> seminars and workshops	<input checked="" type="checkbox"/> multimedia and the internet		-		
	<input checked="" type="checkbox"/> exercises	<input checked="" type="checkbox"/> laboratory				
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor				
	<input checked="" type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)				
	<input checked="" type="checkbox"/> field work					
2.8.Student responsibilities	<p>Student obligations are listed in the Act on integrated study program of the University of Zagreb Faculty for Veterinary Medicine.</p> <p>Student have to gather at least minimum points in each grading element to go to the final exam. Final grade is formed according to the number of points.</p> <p>Number of points for each grading element:</p> <ul style="list-style-type: none"> - Attending lectures: The maximum number of points from this evaluation element is 6 points (minimum is 3 points) - Attending exercises: The maximum number of points from this evaluation element is 6 points (minimum is 4 points) - Attending semianars: The maximum number of points from this evaluation element is 6 points (minimum is 4 points) - Student activity on exercises and seminars: maximal number of points from this evaluation element is 10 points (minimum is 5 points) - Continuous knowledge checking (tests): maximal number of points from this evaluation element is 32 points (minimum is 20 points) - Final exam: maximal number of points from this evaluation element is 40 points (minimum is 24 points) 					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,26	Research		Practical training	0,56
	Experimental work		Report		(other)	
	Essay		Seminar essay	0,14	(other)	
	Tests	2,24	Oral exam	1,4	(other)	
	Written exam	1,4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	The final grade is formed by summing the before mentioned elements of assessment (Class attendance – lectures, seminars, field exercise i intramural exercise and on-line; practical/ independent assignment, tests and final exam). Grading is done by the grades according to the grading system in table.					
	<i>points</i>		<i>grade</i>			
	to 59		1 (F)			
	60-68		2 (E)			
	69-76		2 (D)			

	77-84	3 (C)	
	85-92	4 (B)	
	93-100	5 (A)	
	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	Lokhorst & Groot Koerkamp: Precision livestock farming, 2009. Axford, Bishop, Nicholas & Owen: Breeding for disease resistance in farm animals, 2000. Jiang & Ott: Reproductive genomics in domestic animals, 2010. Field & Taylor: Scientific farm animal production, 2009. Brand, Nordhuisen & Schukken: Hered health and production management in dairy practice, 1997. Lasley, J.F.: Genetics of Livestock Improvement. Prentice-Hall, Inc., New Jerxey, 1987. FAO: Marker assisted selection, 2007. Pierce: Genetics, 2003. Muir & Aggrey: Poultry genetics, breeding and biotechnology, 2003. Houghton Brown, Pilliner & Davies: Horse and stable management, 2003. Root Kustritz: The dog breeders guide to successful breeding and health management, 2006. Radostits, O.M.: Herd Health. W.B. Saunders Company. Philadelphia, 2001. Vella, Shelton, Mcgonagle & Stanglein: Robinsons genetics for cat breeders and veterinarians, 2003.	1 book in the library of The Department of Animal Breeding and Livestock Production	no
	web pages		yes
2.12.Optional literature (at the time of submission of study programme proposal)	Prepared written material for lectures and exercises.		
2.13.Quality assurance methods that ensure the acquisition of exit competences	Students' work will be monitored through conversations (on lectures, seminars, exercises, online via LMS), as well through continuous knowledge testing. At the end of teaching, the knowledge of students will be verified by a final (written and oral) exam.		
2.14.Other (as the proposer wishes to add)			

APPLIED ANIMAL NUTRITION

1. GENERAL INFORMATION			
1.1. Course teacher	Full professor Željko Mikulec, DVM, PhD	1.6. Year of the study programme	2nd
1.2. Name of the course	Applied Animal Nutrition	1.7. Credits (ECTS)	5,5
1.3. Associate teachers	Associate Professor Hrvoje Valpotić, DVM, PhD Diana Brozić DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	25 L + 50 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2nd level, 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Upon completion of the lectures and after passing the final exam of "Applied Animal Nutrition" the students will be able to recognize the conditions in the field and to take feed samples for chemical analysis. They will also know the right procedure of taking samples for analysis and super analysis and to correctly interpret the results. The acquired skills will enable them to individually formulate balanced rations and feedstuffs for all species and categories of animals. They will also be able to recognize specific nutrient deficiencies and malnutrition in domestic and wild animals which could have a negative effect on the health status and their products. Students will be capable of determining and applying preventive and therapeutic feeding in cases of metabolic disorders of high producing animals. Besides field work the students will be capable of working in feed mills and in other biomedical fields which require basic knowledge of veterinary nutrition.		
2.2. Course enrolment requirements and entry competences required for the course	Attended the course of „Basic Animal Nutrition“		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Upon successful completion of the course students will be able to:</p> <ol style="list-style-type: none"> 1. Knowing the characteristics of feeding different species of domestic and wild animals in certain physiological periods 2. Estimating the daily nutritive needs of animals according to the tables of nutritional requirements, biological experiments and practical experience 3. Recognize deficiencies in feed of domestic and wild animals 4. Applied manual and computer assembling meals for certain species and categories of animals 5. Recommend proper feeding for different species and categories of animals in practical farm conditions and corrections for inappropriate feeding 		
2.5. Course content broken	1 Factors affecting feed consumption (Taste. Appearance. Hunger. Appetite. Physical form. Mechanisms of feed intake. Inhibition of feed intake. Expected		

<p>down in detail by weekly class schedule (syllabus)</p>	<p>feed intake. Modulation of feed intake.); 2 Physiological and nutritive specificities of animals (Evolution of feeding. Feeding ecology. Hoffman distribution. Specificities of monogastric and ruminant feeding. Feed utilization strategies); 3 Feeding dairy cows (Feed consumption. Forage-concentrate ratio in cow feeding. Nutritional requirements of dairy cows. Feeding dry cows. Feeding dairy cows in different periods of lactation. Feedstuffs in dairy cow nutrition. Formulating rations for dairy cows. Malnutrition.); 4 Calf nutrition (Physiological and nutritive characteristics of calves. Nutritive requirements of calves. Feedstuffs for feeding calves. Feeding calves in different feeding systems. Feeding fattening calves.); 5 Feeding beef cattle (Feed consumption in beef cattle. Nutrient requirements of beef cattle. Physiological aspects of fattening. Feedstuffs for beef cattle. Types of rations for beef cattle. Feeding beef cattle in intensive and extensive systems); 6 Feeding heifers (Nutrient requirements of heifers. Rations for heifers.); 7 Feeding bulls (Feeding young bulls. Feeding grown bulls. Nutrient and energy requirements of bulls); 8 Sheep nutrition (Feeding habits of sheep and dry matter intake. Nutrient requirements of sheep. Requirement formation principles. Feeds in sheep production. Formulating rations and feedstuffs for sheep. Feeding sheep in different physiological conditions and production periods. Feeding yearlings. Feeding rams. Malnutrition.); 9 Feeding lambs (Nutritional characteristics of lamb feeding. Nutrient requirements of lambs. Feeding lambs in different weaning systems. Feeds and feedstuffs in lamb nutrition. Feeding fattening lambs. Feeding of breeding lambs.); 10 Goat nutrition (Feeding habits of goats and feed intake. Nutrient requirements of goats. Forages in goat nutrition. Formulating rations and feedstuffs for goats. Feeding goats in different production periods. Feeding yearlings. Feeding bucks. Malnutrition.); 11 Feeding kids (Characteristics of kid feeding. Nutrient requirements of kids. Feeding weaned kids. Feeding fattening kids. Feeding breeding kids.); 12 Feeding sows and boars (Physiological and nutritive characteristics of swine. Feeding gestating sows. Feeding lactating sows. Feeding boars. Feeding gilts.); 13 Feeding piglets. (Physiological and nutritional characteristics of piglets. Weaning systems. Nutritive requirements of piglets. The influence of piglet feeding on mucosal immunity and health); 14 Feeding growing-finishing pigs (Physiological and nutritional characteristics of growing-finishing pigs. Feeding systems for growing-finishing pigs. Nutrient requirements of growing-finishing pigs.); 15 Feeding poultry (Physiological and nutritional characteristics of poultry. Feeding breeders. Feeding replacement pullets. Feeding broilers. Feeding turkeys. Feeding ducks. Feeding geese. Feeding Japanese quails. Feeding guinea fowl.); 16 Feeding horses (Physiological and nutritional characteristics of horses. Nutrient requirements of horses. Keeping and feeding systems for horses. Feeding horses in training. Feeding stallions and broodmares. Feeding lactating mares. Feeding foals. Feeding aged and convalescent horses. The influence of nutrition on horse health status.); 17 Dog and cat nutrition (Nutrient requirements of dogs and cats. Similarities and differences of dog and cat nutrition. Nutrition in gestation and lactation. Nutrition of offspring. Nutrition of adult dogs and cats. Nutrition of working dogs. Nutrition of aged animals. Characteristics and types of pet food.); 18 Feeding rabbits and fur animals (Characteristics of the digestive system. Digestion of particular substances. Pet rabbits. Commercial breeding. Feeding systems. Nutrition related diseases.); 19 Game nutrition. (Specific qualities of game nutrition. Nutritive and energy requirements of game. Winter supplement feeding of large and ground game. Nutrition of game animals in intensive production systems.); 20 Feeding ostrich. (Physiological and nutritional characteristics of ostrich. Nutrient requirements of ostrich. Selection of feedstuffs in ostrich feeding. Feeding ostrich in intensive production systems. Malnutrition.); 21 Fish nutrition (Characteristics of fish nutrition opposed to land animals. Natural feeding habits of the fish. Energy and nutrient requirements of fish. Nutrition of freshwater and saltwater fish.).</p>
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2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,99	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	2,31	Oral exam	2,2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimal points		Maksimal points	
	Attending lectures 25 hours		3 (coefficient 0,24) 3 : 0,24 = 13 (12.5)		6 6 : 30 = 0,24 (coefficient 0,24)	
	Attending exercises 50 hours		8 (coefficient 0,24) 8 : 0,24 = 34 (33.3)		12 12 : 50 = 0,24 (coefficient 0,24)	
	Participation at exercises 1 preliminary exam X 10 questions = 10 points 1 question = 1 point		5 (coefficient 1) 5 : 5 = 1		10 10 : 1 = 1 (coefficient 1)	
	Continuous knowledge checking 1 preliminary exam theoretical questions = 1 point calculations = 4 points Total of 32 points		20 (coefficient 1) 20 X 1 = 20		32 32 : 32 = 1 (coefficient 1)	
	Final exam (Oral exam) 1 question = 8 points 5 questions = 40 points		24 (coefficient 8) 24 : 8 = 3		40 40 : 5 = 8 (coefficient 8)	
Total		60		100		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Cheeke, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA.					
2.12. Optional literature (at the time of submission of study programme proposal)	Pond, W. G., D. C. Church, K. R. Pond: Basic Animal Nutrition and Feeding (Fourth Edition). John Wiley and Sons Inc., USA, 1995. Ensminger, M. E., J. E. Oldfield, W. W. Heinemann: Feeds and Nutrition (Second Edition). The Ensminger Publishing Company, USA, 1990.					

2.13. Quality assurance methods that ensure the acquisition of exit competences	
2.14. Other (as the proposer wishes to add)	

BASIC ANIMAL NUTRITION

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Hrvoje Valpotić	1.6. Year of the study programme	2 nd year
1.2. Name of the course	Basic animal nutrition	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	Full professor Željko Mikulec, Assistant Professor Diana Brozić	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 L + 30 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	After successfully passing the exam of course "Basic Animal Nutrition" students will gain basic knowledge in the area of animal nutrition necessary for better understanding the course "Applied Animal Nutrition" which starts the following semester. This means that students are familiar with chemical components of feed, nutritive values of different groups of feedstuffs, and are able to apply this knowledge. In addition, students will be trained for autonomous organoleptic testing of feedstuffs propriety, their sampling, taking part in different methods of feed analysis and interpretation of the results.		
2.2 Course enrolment requirements and entry competences required for the course	Completed final exam in Medicinal Chemistry.		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Understand basic concepts about nutrients - Have an insight into analytical methods and basic chemical analysis of feed - Estimate the nutritional value of feeds - Understand the variations between feed mixtures and pet food Have knowledge about substances that can contaminate feed		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Goals of nutrition and its role in veterinary medicine. (Development of nutrition and current status in science. Interaction: soil, plant, animal. Feed production.); 2. Chemical analysis of feed (Sampling for analysis. Analytical methods. Basic feed composition. Interpretation of feed analysis.); 3. Water and dry matter (Water in feeds. Feed water content. Methods for determining moisture.); 4. Protein and amino acid content of feed (Nitrogenous feeds. Biological value of protein. Ideal protein. Digestible protein and amino acids. Crude protein. Methods for determining crude protein in feedstuffs. Protein in ruminant nutrition.); 5. Carbohydrates in feedstuffs. Methods for determining carbohydrates in feedstuffs. Carbohydrate digestion and the influence on nutrition. Carbohydrate fermentation.); 6. Lipids in feedstuffs (Crude fat and methods for determining crude		

	fat in feedstuffs. Compound lipids. Fatty acids in feedstuffs.); 7. Minerals in feedstuffs (Micro-mineral and macro-mineral elements. Conversion of mineral elements); 8. Vitamins in feedstuffs (Vitamin addition to feeds); 9. Energy metabolism (Energy in feed. Energy fractions in animal system. Importance of energy content in feed formulation.); 10. Feed additives (Classification. Advantages and adverse effects of additive use); 11. Nutrition in different stages of development and production (Maintenance. Growth. Fattening. Work. Reproduction. Gestation. Lactation. Egg production. Wool and mohair production.); 12. Nutritive value of feedstuffs (Dry forages and roughages. Concentrates.); 13. Feed mixtures and pet food (Complete feed mixtures. Premixes. Pet food. Labeling of feed mixtures and pet foods. Legislation concerning feed production.) 14. Factors affecting feed consumption (Taste. Appearance. Hunger. Appetite. Physical form. Mechanisms of feed intake. Inhibition of feed intake. Expected feed intake. Modulation of feed intake.).					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,63	Research		Practical training	
	Experimental work		Report		Participation at exercises	0,35
	Essay		Seminar essay		(other)	
	Tests	1,12	Oral exam	1,40	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimal points		Maksimal points	
	Attending lectures 15 hours		3 (coefficient 0,4) 3 : 0,4 = 7,5 (8)		6 6 : 15 = 0,4 (coefficient 0,4)	
	Attending exercises 30 hours		8 (coefficient 0,4) 8 : 0,4 = 20		12 12 : 30 = 0,4 (coefficient 0,4)	
	Participation at exercises 1 preliminary exam X 10 questions = 10 points 1 question = 1 point		5 (coefficient 1) 5 : 1 = 5		10 10 : 10 = 1 (coefficient 1)	
	Continuous knowledge checking 1 preliminary exam theoretical questions = 1 point calculations = 4 points Total of 32 points		20 (coefficient 1) 20 : 1 = 20		32 32 : 32 = 1 (coefficient 1)	
Final exam (Oral exam) 1 question = 10 points 4 questions = 40 points		24 (coefficient 10) 24 : 10 = 2,4		40 40 : 4 = 10 (coefficient 10)		

	Total	60	100
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	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	POND, W. G., CHURCH, D. C., POND, K. R. (1995): Basic Animal Nutrition and Feeding. Fourth Edition. John Wiley and Sons.		
	DRYDEN, G. (2008): Animal nutrition science. Cambridge university press. Cambridge		
	CHEEKE, P. R. (2005): Applied Animal Nutrition. Feeds and Feeding. (3rd ed.). Pearson Prentice Hall, USA.		
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

GENERAL MICROBIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Ljiljana Pinter, PhD, DVM	1.6. Year of the study programme	2
1.2. Name of the course	General Microbiology	1.7. Credits (ECTS)	3.5
1.3. Associate teachers	Prof Nevenka Rudan, PhD, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	L 12 S 12 E 30
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate veterinary study programme	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Microbiology is an important preclinical course where students are prepared for further understanding of lessons in General pathology and pathological morphology, Pharmacology and clinical courses such as infectious diseases and microbial intoxication of animals. Procedures of sterilization, of sampling and sending different materials for further microbiological and immunological tests, simple procedures of microorganism identification, including use of commercial compounds suitable for veterinarians in practice will be offered throughout practical work to students attending the course. Lessons and practices in microbiology offer basic knowledge on morphology, physiology, specific qualities of cultivation and identification, antigen properties, tenacity, relation to antimicrobial substances, pathogenicity of particular microorganisms and methods of aethiological diagnostics as well as possibilities of immunoprophylaxis of infectious diseases		
2.2. Course enrolment requirements and entry competences required for the course	Attended course lectures of Veterinary Immunology.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Microbiology is an important preclinical course where students are prepared for further understanding of lessons in General pathology and pathological morphology, Pharmacology and clinical courses such as infectious diseases and microbial intoxication of animals.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to demonstrate, after attended lessons and practices in microbiology, basic knowledge on morphology, physiology, specific qualities of cultivation and identification, antigen properties, tenacity, relation to antimicrobial substances, pathogenicity of particular microorganisms and methods of aethiological diagnostics as well as possibilities of immunoprophylaxis of infectious diseases. After the course students are able to sterilize, to take and send different materials for further microbiological and immunological tests, to perform simple procedures of microorganism identification, including use of commercial compounds suitable for veterinarians in practice.		
2.5. Course content broken down in detail by	Microbiology development and its importance in veterinary medicine. Bacterial morphology (shape, size, structure, mobility, spores). Bacterial physiology. Bacterial ecology. Bacterial genetics. Antibiotics and mechanisms of their effects. Bacterial resistance.		

weekly class schedule (syllabus)	Morphology, physiology and reproduction of yeast and moulds. Virology development. Basic properties of viruses. Physical properties and chemical composition of viruses. Antigenic properties. Viral replication. Viral cultivation. Effects of viral infection of cell. Hemagglutination. Hemadsorption. Bacteriophages and phagotyping. Viral genetics. Viral interference. Tumours. Effects of physical and chemical factors on viruses. Antiviral chemotherapy. Prions and viroids. Viral diseases diagnostics (laboratory diagnostics).					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,63	Research		Practical training	
	Experimental work		Report		Practical work and seminar activities	0,35
	Essay		Seminar essay		(other)	
	Tests	1,12	Oral exam		(other)	
	Written exam	1,4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<ol style="list-style-type: none"> 1. Class attendance 2. Exercises 3. Seminar 4. Activities at exercises and seminars 5. continuous knowledge checking 6. Final exam <p>Minimum points are 3 (min 6 hours of class attendance), and maximum are 6 points (max 12 hours of class attendance) for class attendance. Minimum points are 4 (min 20 hours of exercises), and maximum are 6 points (max 30 hours of exercises) for exercises. Minimum points are 4 (min 8 hours of seminar), and maximum are 6 points (max 12 hours of seminar) for seminar . For exercises and seminar activities maximum points are 10 (35 points out of three grading elements), and minimum are 5 points (min 16 points out of three grading elements): a) prepared for exercises and seminars and b) succesful experimental work (total 35, coefficient 0.2857). Five point is for succesful preparation for exercises and seminars gained by oral examination. One point is for succesful exercises, signed in student notebook. Preparation for exercises and seminars is 10 points (total 20), and each succesful experimental work is 1 point (total 15 points for 15 excercises).</p> <p>Two continuous knowledge checking will be organised at the beginning of the excercises. Each has 10 questions with 1.6 points. In order to gain minimum of 20 points student must give correct answers to minimum 13 questions. Maximum is 32 points for total questions (20 questions x 1.6 points = 32 points). Final written exam has 40 questions (1 question = 1 point). A student must give correct answers to 24 questions in order to gain a minimum of 24 points. Maximum is 40 points</p>					

	Type of activity	Minimal number of points	Maximal number of points														
	Attending lectures	3	6														
	Attending seminars	4	6														
	Attending exercises	4	6														
	Participation at seminars and exercises	5	10														
	Continuous knowledge checking	20	32														
	Final exam	24	40														
	Total	60	100														
For the final exam student must have minimum of 36 points (attendance and participation at lectures, seminars, exercises and continuous knowledge checking.																	
<table border="1"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>				Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
Points	Grade																
up to 59	1 (F)																
60-68	2 (E)																
69-76	2 (D)																
77-84	3 (C)																
85-92	4 (B)																
93-100	5 (A)																
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media														
	Quinn, P. J., M. E. Carter, B. K. Markey, G. R. Carter (1994): Clinical Veterinary Microbiology. M. Wolfe. London.																
	Songer, J. Glenn, K. W. Post (2005): Veterinary Microbiology. Bacterial and Fungal Agents of Animal Disease. Elsevier Saunders.																
2.12. Optional literature (at the time of submission of study programme proposal)	1.Hajsig, D., F. Delaš (2016): Priručnik za vježbe iz opće mikrobiologije. Sveučilišni priručnik, Hrvatsko mikrobiološko društvo, Zagreb. 2.Naglić, T., D. Hajsig, J. Madić, L. Pinter (2005): Specijalna veterinarska bakteriologija i mikologija.Veterinarski fakultet Sveučilišta u Zagrebu i Hrvatsko mikrobiološko društvo 3.Topolnik, E., T. Naglič, D. Hajsig (1980): Opća mikrobiologija i imunologija. Veterinarski fakultet Zagreb, Zagreb. 4.Materijali s predavanja 5.Mrežne stranice Zavoda za mikrobiologiju i zarazne bolesti s klinikom Veterinarskog fakulteta Sveučilišta u Zagrebu. 6.Kalenić. S., E. Mlinarić-Missoni (1995): Medicinska bakteriologija i mikologija. Zagreb. 7.Presečki, V. et al. (2002): Virologija, Medicinska naklada, Zagreb. 8.Brudnjak, Z. (1987): Medicinska virologija. Jugoslavenska medicinska naklada. Zagreb.																
2.13. Quality assurance methods that ensure the acquisition of exit competences	Test results, final discussions and anonymous questionnaires in order to get student critical opinion and suggestions for improvement.																
2.14. Other (as the proposer wishes to add)																	

HYGIENE AND HOUSING OF ANIMALS

1. GENERAL INFORMATION			
1.1. Course teacher	Full prof. Kristina Matković	1.6. Year of the study programme	2.
1.2. Name of the course	Hygiene and housing of animals	1.7. Credits (ECTS)	6.0
1.3. Associate teachers	Assoc. prof. Gordana G. Gračner Assist. prof. Mario Ostović Ivana Sabolek, DMV - assistant	1.8. Type of instruction (number of hours L + S + E + e-learning)	29 + 22 + 44
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The course will enable the students acquire skills and knowledge qualifying them to ensure appropriate animal housing to prevent the occurrence of unfavourable conditions of housing environment that may compromise animal health, productivity and reproduction. In addition, students will acquire due knowledge about the methods of animal waste disposal to prevent environmental contamination, and on the role of veterinarian in animal care and transportation to prevent stress situations and health disturbance due to inappropriate transfer from one setting to another one, or because of poor animal hygiene. Sanitation plays a crucial role in preventive veterinary medicine; therefore the course will provide students with due knowledge and skills in the methods, types and effects of disinfection in preserving animal health as well as in the control of pest insects and rodents in the environment to prevent the spread of disease to humans and animals. The objective of the course is to develop competences qualifying students for preservation of biological balance between the environment and the animal while exhibiting appropriate health state through optimal productivity and reproduction.		
2.2. Course enrolment requirements and entry competences required for the course	Completed course «Environment, animal behaviour and welfare».		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - describe the impact of the accommodation and housing conditions of certain species and categories of animals on their health, production and reproductive performance; - define the role of veterinarians in the transportation and care of animals, in order to avoid stress and disorders in their health due to improper transfer from one environment to another, or poor hygiene of animals; - choose ways of animal waste substances disposing for the environmental pollution prevention; - independently verify the microclimatic conditions in certain animal facilities; 		

	<p>- propose appropriate measures of disinfection and control of harmful insects and rodents in order to preserve the animals and humans health status;</p> <p>- independently conclude about animal welfare on the basis of the production conditions</p>	
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>1. Environment and animal health (Environmental factors – biotic and abiotic; Thermocomfortable and thermoneutral zone); 2. Construction and equipping of stables (Stable types; Choice of site; Construction elements of stable; Thermal and hydroisolation of housing; Stable equipping); 3. Microclimate and microclimate elements (Temperature, humidity, air flow velocity, dust and airborne micro organisms; Noise and its sources; Lighting; Stable air gas composition; Determination of stable microclimate conditions); 4. Heat balance in stables (Definition; Heat generated by animals; Heat lost through exposed surfaces – coefficient of heat flow; Heat needed for warming up fresh air); 5. Hygiene of cattle housing and accommodation (Bioecologic cattle characteristics in the context of their housing and accommodation; Systems of keeping particular cattle categories; Microclimate factors in cattle barns); 6. Hygiene of sheep housing and accommodation (Sheep stable; Microclimate factors in sheep stable; Sheep stable equipment; Auxiliary structures in modern sheep farm system); 7. Hygiene of goat housing and accommodation (Goat stable; Microclimate factors in goat stable; Goat stable interior; Auxiliary structures in modern goat farm system); 8. Hygiene of pig housing and keeping (Keeping of gilts, nongravid, gravid and lactating sows; Keeping of weaned piglets; Keeping of fattening pigs; Keeping of boars; Microclimate complex in pig housing); 9. Hygiene of horse housing and accommodation (Types of horse stables; Keeping of particular horse categories; Microclimate specificities of horse stables); 10. Hygiene of poultry housing and accommodation (Bioecologic characteristics of poultry, and types of accommodation and housing of particular species and age categories – chicken, turkey, duck, goose, pheasant, partridge; Species specific egg incubation); 11. Hygiene of pet housing and accommodation (Accommodation and housing of dogs and cats; Hygiene of housing other pet species – hamsters, small rodents, cage birds, aquarium fish, terrapin, etc.); 12. Hygiene of laboratory animal housing and accommodation (Bioecologic characteristics of most common laboratory animals; Basic principles of housing technology; cage, equipment, hygiene and care of laboratory animals); 13. Prophylaxis of diseases of the young (Environmental diseases of the foals, calves, lambs, kids, piglets and poultry; Ecologic factors and their alteration as the cause of disease of the young; Prophylactic measures in the prevention of diseases of the young); 14. Animal faecal substance (Solid and liquid manure; Processing, hygienization, composting; Biogas – distribution and environmental effects); 15. Animal waste disposal (Procedures for carcasses and offals: utilization facilities, grave pits, cattle graveyards, incinerating plants); 16. Animal transportation (Specificities of animal transportation by particular transportation facilities in domestic and international transport; Losses and damages during transportation); 17. Heard health in context of housing hygiene and animal welfare; 18. Disinfection in veterinary practice (Types and methods of disinfection; Action and chemical composition of disinfectants; Applied disinfection – drinking water, wastewater, housing, hands, plants for food manufacture and processing, transport facilities; Disinfection in the prevention and control of zoonoses); 19. Control of pest insects in veterinary practice and cattle breeding (Bioecologic characteristics of pest insects in cattle breeding and public health; Control methods; Insecticides); 20. Control of pest rodents in veterinary practice and cattle breeding (Bioecologic characteristics of pest rodents; Their role in veterinary practice and public health; Control methods; Rodenticides). 21. Sanitary measures that are carried out for the purpose of animal health and environmental protection.</p>	
<p>2.6. Format of instruction:</p>	<p><input checked="" type="checkbox"/> lectures</p> <p><input checked="" type="checkbox"/> seminars and workshops</p> <p><input checked="" type="checkbox"/> exercises</p> <p><input type="checkbox"/> on line in entirety</p> <p><input type="checkbox"/> partial e-learning</p> <p><input checked="" type="checkbox"/> field work</p>	<p><input type="checkbox"/> independent assignments</p> <p><input checked="" type="checkbox"/> multimedia and the internet</p> <p><input checked="" type="checkbox"/> laboratory</p> <p><input type="checkbox"/> work with mentor</p> <p><input type="checkbox"/> (other)</p> <p>2.7. Comments:</p>

2.8. Student responsibilities					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,08	Research		Practical training
	Experimental work		Report		Activities
	Essay		Seminar essay		(other)
	Tests	1,92	Oral exam		(other)
	Written exam	2,4	Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	Activities	Minimum points number		Maximum points number	
	Presence at lectures 29 hours 16 (III semester) + 13 (IV semester)	3 2 points (III semester) $2/0,25 = 8$ sati lectures + 1 point (IV semester) $1/0,15 = 7$ hours of lectures		6 4 points (III semester) $4/16 = 0,25$ (coefficient for presence on 1 hour of lectures) + 2 points (IV semester) $2/13 = 0,15$ (coefficient for presence on 1 hour of lectures)	
	Presence at seminars 22 hours: (IV semester)	4 (IV semester) $4/0,27 = 15$ hours of seminars		(IV semester) $6/22 = 0,27$ (coefficient for presence on 1 hour of seminars)	
	Presence at exercises 44 hours: 24 (III semester) + 20 (IV semester)	4 2 points (III semester) $2/0,125 = 16$ hours of exercises + 2 points (IV semester) $2/0,15 = 13$ sati of exercises		6 3 points (III semester) $3/24 = 0,125$ (coefficient for presence on 1 hour of exercises) + 3 points (IV semester) $3/20 = 0,15$ (coefficient for presence on 1 hour of exercises)	
	Activity in seminars and exercises 10 points ¹ : 2 (III semester) + 8 (IV semester)	5 1 point (III semester) $1/1 = 1$ + 4 points (IV semester) $4/1 = 4$		10 2 points (III semester) $2/2 = 1$ + 8 points (IV semester) $8/8 = 1$	
	Continuous knowledge assesment 32 points ² : 16 (III semester) + 16 (IV semester)	20 10 points (III semester) $10/1 = 10$ + 10 points (IV semester) $10/1 = 10$		32 16 points (III semester) $16/16 = 1$ + 16 points (IV semester) $16/16 = 1$	
	Final exam (40 points ³)	24 $24/1 = 24$ (coefficient 1) (minimally student must collect 24 points to achive 24 minimum points)		40 $40/40 = 1$ (coefficient 1)	

	Ukupno	60	100
	¹ – assesment of practical exams (III semester, 2 points) – two positive answer during exercises (each answer one point) and producing of seminar work during semester (IV semester – 2 points, if in power point additional 2); preparation of reports from field exercises (IV semester) 4 points, in total 10 points ² – 32 points (4 written tests (in each semester two) × 8 questions = 32 questions; each question 1 point, for passage minimum 5 points per test) ³ – 40 max points (written exam - 8 questions / each question have max points that can be achieved)		
	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	Grandin, T. (2000): Livestock Handling and Transport (2nd Edition). CABI Publishing, London, UK.		online
	Younie, D., J.M. Wilkinson (2001): Organic Livestock farming. Chalcombe Publications.	1	
	Aland, A., F. Madec (2010): Sustainable animal production. Wageningen Academic Publishers, NL.	2	
	Aland, A., T. Banhazi (2013): Livestock housing. Wageningen Academic Publishers, NL.		online
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Student questionnaire		
2.14. Other (as the proposer wishes to add)			

INTRODUCTION TO ENGLISH VETERINARY MEDICAL TERMINOLOGY II

1. GENERAL INFORMATION			
1.1. Course teacher	Dubravka Vilke-Pinter, Ph.D.	1.6. Year of the study programme	2
1.2. Name of the course	Introduction to English Veterinary Medical Terminology II	1.7. Credits (ECTS)	1
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	5 hours S + 10 hours E (tutorials)
1.4. Study programme (undergraduate, graduate, integrated)	undergraduate	1.9. Expected enrolment in the course	25
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of this course is to expand students' knowledge of the specifics of the language register pertaining to the field of veterinary medicine, primarily of technical terminology, widely present in the professional literature from the field. The course also aims to develop students' understanding of structural patterns and linguistic means used to achieve textual cohesion in scientific literature. Besides providing training in reading scientific and professional literature the course also aims to develop general progress in both written and oral language skills.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	By developing students' skills to use technical vocabulary specific for the field of veterinary medicine and through the process of developing their academic reading skills the course aims to develop students' abilities to use relevant literature in the field of veterinary medicine which the students will need both during their academic studies and also during the process of life-long learning throughout their professional careers.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	student will/wil be able to: effectively recognise a number of technical and scientific terms used in various fields of veterinary medicine explain principles of word formation in scientific veterinary medical English independently use a number of scientific terms in a given context understand structure of scientific text and and recognise various types of cohesive means actively use some cohesive devices in a text to achieve text cohesion increase scope of general verbal understanding		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 st methodical unit: Analysis and usage of professional terminology in technical and academic texts. Usage of cohesive devices that create coherence in technical and academic texts. Topic: Organs and organ systems. 2 nd methodical unit. Classifications. Topics: Species diversity; Taxonomic classifications. 3 rd methodical unit: Graphical presentation of data. Topic: Ecology and endangered species. 4 th methodical unit: Physical description. Skeletal system. Basic terms in genetics. 5 th methodical unit. Description of processes and of sequences of events. Digestive system of ruminants. Developmental cycles in some animal		

	species. 6 th methodical unit. Cause-and effect relations. Topic: Etiology and pathogenesis of diseases. Analysis of technical terms. 7 th methodical unit. Contrasting and comparing. Topic: Cattle breeds.				
2.6 Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other) language tutorials		2.7. Comments:
2.8. Student responsibilities					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	18%	Research		Practical training
	Experimental work		Report		Class participation
	Essay		Seminar essay		(other)
	Tests	32%	Oral exam		(other)
	Written exam	40%	Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	Assessment elements				
	Overall grade elements	class attendance class participation continual assessment final exam			
	Class attendance	15 hourly classes	Minimum number of points		Maximum number of points
			11 coefficient = $18/15 = 1,2$ Students must attend at least 9 out of 15 hourly classes (3 hours S and 6 hours E) to achieve minimum number of points		18
	Class participation		5 coefficient $10/15 = 0,66$ Students must earn at least 5 points out of maximum 10 by performing in-class assignments		10
	Continual assessment		20 Students take a mldterm test Minimum passing score on the test is 20 points		32
	Final exam		24 Minimum passing score on the final test is 24 points		40
	Final grade	Overall course grade is based on student's performance in the four assessed elements. Students are entitled to take final exam in case they have earned minimum number of points for each evaluated element			

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	Vilke-Pinter, D. (2018). Introduction to English Veterinary Medical Terminology (Part 2) - reading materials for internal use at the Veterinary faculty - each student receives his/her individual copy of the materials	3	
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Cochran P. (1991). Student's guide to Veterinary Medical Terminology. St. Louis, Mosby.</p> <p>Cox, K. & Hill, D. (2007). Preliminary English for Academic Purposes. Longman.</p> <p>McBride, D.E. (2002). Learning Veterinary Terminology. Mosby.</p> <p>McCarthy, M & O'Dell, F. (2008). Academic Vocabulary in Use. Vocabulary Reference and Practice. Self-study and Classroom Use. Cambridge: CUP.</p> <p>McCormack, J. (2005). English for Academic Study. Garnet Publishing Ltd. Garnet Education.</p> <p>Porter. D & C Black (2007). Check your Vocabulary for Academic English. A & C Black Publishers Ltd.</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continual assesment during classes: written and oral asignments,in-class writing activities, homework		
2.14. Other (as the proposer wishes to add)			

MOLECULAR BIOLOGY AND GENOMICS IN VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Full prof. dr. sc. Maja Popović, PhD	1.6. Year of the study programme	2nd
1.2. Name of the course	Molecular biology and genomics in veterinary medicine	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	Prof. Josip Kusak, PhD; Full prof. Ksenija Vlahović, PhD; Prof. Tomislav Gomerčić, PhD; Assistant prof. Daniel Špoljarić, PhD;	1.8. Type of instruction (number of hours L + S + E + e-learning)	5+10+30
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be able to recognize importance and contribution of genomics and proteomics in veterinary medicine and biotechnology. They will be able to comprehend and check basic laws of inheritance at the molecular level, from phenotype expression in prokaryotes and animals, up to qualitative and quantitative phenogenetics of artificial selection. They will acquire knowledge about molecular processes of informative macromolecules up to genome expression in prokaryotes and animals. They will be able to recognize causes and effects of spontaneous and induced mutations in animals. They will acquire with the role and biomedical importance of molecular signals and differential molecules involved in the regulation of cell and life cycle in animals, particularly during their embryonic development. Students will be able to recognize the methods of molecular biology applicable in veterinary medicine and comprehend their importance in prevention, diagnostic and therapy, as well as in the veterinary biotechnology. They will realize possible risks of applying recombinant DNA technology for health and welfare of animals and humans, as well as for environment. To enroll in the course Molecular biology and genomics in veterinary medicine students must first undergo the following: Zoology, Botany in Veterinary Medicine, Medical Chemistry, Biochemistry in Veterinary Medicine.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	1. Recognition and understanding of contemporary aspects of cytology, molecular biology and genetics in veterinary medicine, public health and forensic. 2. Understanding of basic principles of molecular research of animal cells and tissues.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Understanding of molecular processes of replication, transcription and translation of animal information macromolecules. 2. Understanding health and ecological justification and risk of using transgenic animal organisms and cells, biotechnological preparations (cytokines, hormones, enzymes, vaccines, medications) and genetically modified food of animal origin. 3. Understanding genetic disorders of animals of interest for veterinary medicine.		

	4. Selecting molecular-genetic method for preventive, diagnostic and therapy of ill animal.
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1 Historical aspects and future challenges (Past, present and future of molecular biology and genomics within the scope of veterinary medicine and public health, Concept and importance of genomics and proteomics in veterinary medicine); 2 Origin and evolution of animal cells at the molecular level (Molecular basis of animal embryonic organisms development; Comparative approach to the molecular structure of animal cells (mammals and birds) of interest for veterinary medicine; Animal cells as experimental models in veterinary medicine (epithelial, limbal cells, melanocytes, fibroblasts from domestic pig as a model system in biomedical research); 3 DNA, genes and heredity in animals (DNA molecule as a carrier of genetic information; Comparative review of animal karyograms (mammals and birds); Genetic maps of animals (mammals and birds); Application of Mendelian laws of inheritance in veterinary medicine; Sexually related characteristics in animals (colour of fur in "caliko cats", colour of coat in cattle, possessing or non possessing of horns in sheep, colour of feathers in hens etc.); Multiple genes of interest for veterinary medicine; Lethal genes of animals; Population genetics: natural and artificial selection at the level of herd and/or flock for health and productivity traits in species of interest for veterinary; phylogenetic relations (species, subspecies, breeds, geographic varieties) of animals at the molecular level; Mutations of genomes, chromosomes and genes in animals; 4 Bioenergetics of animals at the molecular level (a comparative review of mitochondrial genomes); Molecular basis of animal cells metabolism; 5 Replication, self-maintenance and rearranging of genomic DNA of animals (Molecular mechanism of DNA replication – origin and initiation of the replication.) DNA polymerase. Replication fork, fidelity of the replication process. Direct damage reversal of DNA. Telomeres and telomerase (multiplying of chromosomal terminal ends. DNA repair (excision and recombination repair). DNA arrangement, transposition and amplification of genes); 6 Synthesis and maturation of RNA (Types of RNA. Transcription, Regulation of transcription - cis regulatory genes; Maturation and metabolism of mRNA); 7 Synthesis, arrangement and regulation of proteins in animals (Transport RNA. Structure of ribosome. Process of translation – initiation, elongation and termination; Levels of structure of proteins); 8 Expression of genetic information in animals (Gene expression in animals. Colinearity of genes and proteins. Genetic markers in animals (birds and mammals). RNA viruses and reverse transcription); 9 Regulation and control of gene expression in animals (Eukaryotic gene function. Transcription control of gene expression – transcription activators, repressors and control gene regions in animals; Posttranscription control (feedback inhibition of translation and protein degradation); 10 Cell signalling in animal cell (Forms of signalling between the cells. Signalling molecules and their membrane receptors. Paths of transfer of cell signals from the membrane to the nucleus – genes. Signalling of cell survival); 11 Cell cycle of animal cell (Molecular events in the M phase – phases of mitosis, meiosis and cytokinesis; Effects of cell growth and extracellular signals on regulation of cell cycle. Control points of the cell cycle. Comparative review of molecular aspects of gametogenesis, fertilization and activation of zygote in animals (mammals and birds). Regulators of development through the cell cycle; Molecular mechanisms of physiological and pathological apoptosis of animal cell); 12 Regulators of normal cell proliferation and differentiation in animals (Stem cells of animal origin and their application in veterinary medicine; Cell proliferation and differentiation. Differentiation molecules and function of mature cells. Protooncogenes – protooncoproteins. Transformation of protooncogenes into oncogenes. Point mutations of protooncogenes in animals . Amplification of protooncogenes. Retrovirus insertion into region of protooncogenes. Translocation of protooncogenes); 13 Signalling in genetic control of the embryonic development of animals (Homeotic genes. Evolution of homeotic genes. Expression of hox genes during embryonic development. Mutations of hox genes – developmental anomalies in animals - birds and mammals); 14 The recombinant DNA technology in veterinary medicine (From genes to proteins and vice versa. Production of recombinant molecules –</p>

	<p>cytokines, interferons, vaccines of interest for veterinary medicine; Vectors for recombinant DNA. Expression of cloned genes. Detection of nucleic acids. Gene transfer in animals. Transgenic animal cells and organisms – GMO. Molecular genetics in diagnostic of inherited diseases of domestic animals (birds and mammals); Mutagenesis of cloned genes. Production of animal proteins in bacterial cells. Application of gene therapy <i>ex vivo</i> and <i>in vivo</i> in veterinary medicine. Application of reproductive and therapeutic cloning in veterinary medicine); 15 Cellular and molecular methods in veterinary medicine, public health and animal forensic genetics (Application of cellular and molecular methods in veterinary medicine; Hybrid technology. Animal germinal cell cultures. Animal cells culturing. Functional cell tests. Cytometric determination of lymphoid/myeloid cell profiles in peripheral blood and other body fluids of animals. Electrophoresis. Animal genomic DNA isolation. Animal RNA isolation. Methods for analysis of DNA, RNA and proteins. – Southern blot, Western blot, Northern blot. DNA amplification by polymerase chain reaction - PCR. DNA typing. DNA fingerprinting. DNA sequencing. DNA/RNA hybridization. DNA probes. DNA chips. <i>In situ</i> hybridization in immunocytochemistry).</p>					
2.6. Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Attending lectures, seminar and lab exercises. Preparing for lab from materials on LMS. Preparing, presenting and defending one seminar.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.63	Research		Practical training	
	Experimental work		Report		Activity (other)	0.35
	Essay		Seminar essay		(other)	
	Tests	1.12	Oral exam		(other)	
	Written exam	1.4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>During the session of the “Molecular biology and genomic” course a student must attend 3 hours of lectures in order to gain 3 minimal points. The maximal number of points gained from this evaluation element is 6 points. During the session of the “Molecular biology and genomic” course a student must attend 7 hours of seminars in order to gain 4 minimal points during the semester. The maximal number of points gained from this evaluation element is 6 points. During the session a student must attend 20 hours of practices in order to gain 4 minimal points during the semester. The maximal number of points gained from this evaluation element is 6 points. During the session at the time of seminars and practices the student must solve specified problems from 5 seminar lessons and 30 exercise lessons, and he/she gains the lecturer’s signature for that. Each correctly done and signed seminar or exercise lesson is worth 1 point. At seminars and exercises a student can gain the total of 35 points. During the session a student must gain the total of 20 points in order to earn minimal 5 points. The maximal number of points gained from this evaluation element is 10. During the session seven preliminary exams will be organized at the time of exercises. Each preliminary exam consists of 5 questions or problems. Each correctly solved problem or answered question is worth 1 point. From this evaluation element it is possible to earn 35 points max. The student must gain 22 points from preliminary exams in order to earn minimal 20 points. The maximal number of points a student can gain from this evaluation element is 32 points. A student who does not gain minimal 22 points from preliminary exams during the session, has a right to a makeup preliminary exam containing teaching material from all programme</p>					

exercises, which will be organized upon completion of the lessons in that session. The total number of points at the preliminary exam is 35. A student who passes the makeup preliminary exam with more than 50 % correct answers has right to take the final exam. The minimal conditions for passing at the first, second, third, fourth and fifth evaluation elements will be summed up and they will be worth a total of 36 points. In order to take the final exam a student should gain the stated 36 points. The final exam starts with a student's short analysis of results gained from the five types of activities of continuous knowledge checking. Questions in the final exam will be put in a way that a student can answer in writing. The maximum number of points that can be gained from the final exam is 60 points. A student must show at least a sufficient knowledge at the final exam regardless of gained number of points from the first five evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 36 in order to gain minimal number of 24 points. In case a student does not satisfy at the final part of the exam, the lecturer determines time for re-examination. Regardless of a fact that a student gained the number of points from the first five evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all six evaluation elements, according the following table. The final mark is expressed in terms of quantity by a numeric value and by a grade in accordance with points value, from 1 to 5. Student who didn't successfully master the course programme is marked by 1. Mark 1 stands for insufficient achievement.

<i>Points</i>	<i>Grade</i>
up to 59	1 (F)
60-68	2 (E)
69-76	2 (D)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	.Cooper, G. M., R. E. Hausman (2016): The cell: A molecular Approach, Sinauer Associates, Inc. Publishers Sunderland, Massachusetts U.S.A. 2.Tamarin, R. H. : Principles of genetics. McGraww Hill, Boston, New York, London, 2002.		
2.12. Optional literature (at the time of submission of study programme proposal)	2. Johnson G.B.: The living world. McGraww Hill, Boston, New York, London, 2000.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous oral and written checking of acquired knowledge		
2.14. Other (as the proposer wishes to add)			

PHYSICAL EDUCATION

1. GENERAL INFORMATION			
1.1. Course teacher	Saša Čuić, B.A. – Senior Lecturer	1.6. Year of the study programme	Second year
1.2. Name of the course	Physical Education	1.7. Credits (ECTS)	1
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	30 hours per semester of practical work
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Physical education should become an integral and vital part of the University and should encourage free expression in sports of all its members, both students and teachers. This subject also helps students to perform better and with greater efficacy in their studies.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Possibility changes morphological characteristics, motor and functional abilities; training students for independent physical exercises; laws of medical culture; quality nutrition.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	-learning new conventional motor knowledge, -improve basics theoretical and practical kinesiology knowledge, -fortify interest, antropological characteristics and motor informations -promote sports culture		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Swimming, basketball, football, volleyball, handball, dances, aerobics, badminton, skating, skiing, squash, sports on the water (sailing, paddle), riding.		
2.6. Format of instruction:	<input type="checkbox"/> lectures	<input type="checkbox"/> independent assignments	2.7. Comments:
	<input type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet	
	xx <input type="checkbox"/> exercises	<input type="checkbox"/> laboratory	
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor	
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)	
	<input type="checkbox"/> field work		
2.8. Student responsibilities	Compulsory full-time appearance and active participate. Possibility of writing seminar work of interest area (kinesiology science) students, in case incomplete work of compulsory programme. Possibility participate at University Championships in 23 male and female sports, cross competition and visiting sport events.		

2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	xx	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests		Oral exam		(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Initially knowledge students check over interest for some programme, there is no examination, by questionnaire students pursue quality of work course instructors. Accomplishment min. 80% of whole education in semester, students acquire right for signature of professor.					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Literature is not obliged. Recommendation: Heimer, S. (2003). Promotion medical-preventive physical activity in Croatia. Sport for all 21 (35), 3-4. Mišigoj-Duraković, M., Z. Duraković, S. Xiukun, L. Petrinović (2003). Physical exercise in prevent of chronicle aninfection diseases. Sport for all 21 (33-34), 25-28. Bartoluci, M., D. Omrčen (2003). Promotion as an element of marketing mix in sport and sport tourism: The Croatian Experience. Kinesiology 35 (1), 72-84.					
2.12. Optional literature (at the time of submission of study programme proposal)	Depending on interest area of students: e.g. VOLLEYBALL: Janković, V., N. Marelić (2003). Volleyball for all. Zagreb, authors edition. Officially regulations of volleyball (2004). Croatian volleyball Union, Zagreb. Marelić, N., V. Janković (1996). Vooleyball technics. Zadar, Cesar press. e.g. SWIMMING: Volčanšek, B. (1996). Sportive swimming (Manual). Faculty of Kinesiology, Zagreb. Fina-regulations of swimming (2002). Assembly judges Croatian swimming Union, Zagreb. Volčanšek, B. (2002). Essence of swimming Manual). Faculty of kinesiology, Zagreb. Szabo, I. (2002). Method exercises for development of swimming technics (Master's thesis). Faculty of kinesiology, Zagreb.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Verification knowledge and skills and participate on education pursues at pedagogic work with students, evidence active sports and medical status pursues at consultations with students, evidence and valuing results on University Championships in 23 male and female sports pursues at consultation with students and on the sport arenas, where competition are preserve.					
2.14. Other (as the proposer wishes to add)						

PHYSIOLOGY OF DOMESTIC ANIMALS I

1. GENERAL INFORMATION			
1.1. Course teacher	Ana Shek Vugrovečki, PhD, assistant profesor Ivona Žura Žaja, PhD, assistant profesor - deputy	1.6. Year of the study programme	II.
1.2. Name of the course	Physiology of domestic animals I	1.7. Credits (ECTS)	6
1.3. Associate teachers	Jasna Aladrović, PhD, full professor; Ana Shek-Vugrovečki, PhD, assistant professor; Ivona Žura Žaja, PhD, assistant professor; Lana Pađen, PhD, assistant professor; Jadranka Pejaković Hlede, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+0+50
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)
2. COUSE DESCRIPTION			
2.1. Course objectives	Course of Physiology of domestic animals I qualifies students for progressive development of knowledge and understanding of basic principles and facts of physiological processes from cell to the total body, understanding and correlating of regulatory mechanisms, understanding of homeostasis keeping, acid-base balance, development of knowledge and skills related to body liquids in special regard of blood physiology, understanding of physiological function of muscle/nervous system, physiological function of hormones in context of the whole homeostatic system. The goal is to provide the progressive development of skills in collecting, preparing, and interpreting the results of the different sample analysis, to provide modern trends in veterinary physiology so that students will achieve a working knowledge of physiology; development of abilities for interpretation, and conclusion about information; the abilities of searching for information in the literature.		
2.2. Course enrolment requirements and entry competences required for the course	Enrolment requirements: passed exam in Medical Chemistry Entry competences: - acquired knowledge and skills in : a) Physics and Biophysics, b) Biochemistry for Veterinary Medicine c) Domestic animals' anatomy with organogenesis II d) Histology and General Embryology		
2.3. Learning outcomes at the level of the programme to			

which the course contributes						
2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully mastering the course students will be able to: 1) describe the basic principles and the facts of the physiological processes from the cell to the whole organism, 2) explain the physiological functions of the blood, nervous and muscular system and hormones, 3) recognize the importance of maintaining continuous function of blood, nerve and muscle tissue, 4) connect the regulatory mechanisms maintain homeostasis and acid-base balance; 5) use the skills of obtaining and analyzing whole blood, plasma, and serum 6) to evaluate whether the obtained values are within physiological limits for certain species of domestic animals, and 7) to conclude how blood tests can indicate certain pathological changes or certain disease stages					
2.5.Course content broken down in detail by weekly class schedule (syllabus)	1. Introduction (Introduction to physiology of living creatures, importance in veterinary medicine, necessary knowledge). 2. Body fluids (Body fluids dynamics, osmotic pressure, intracellular and extra cellular fluid). 3. Homeostasis, acid-base balance (Internal environment – confined system, ways of keeping homeostasis, mechanisms for acid-base balance keeping): 3. Cell Physiology (Transport across cell membranes, epithelial transport, plasma-membrane receptors, membrane potentials, action potentials. 5. Blood Physiology (Blood functions, plasma; composition and role, haematopoiesis, regulation of haematopoiesis, nutritive and maturation factors of haematopoiesis. Erythrocytes, leukocytes, physiological haemolysis, platelets, blood coagulation. Blood groups). 6. Nervous Physiology (Nervous system organisation, neuron, nerve impulse formation, impulse travels, synapse, neurotransmitters, receptors and receptor potential. Peripheral nervous system, CNS, autonomic nervous system). 7. Muscle Physiology (Physiological features of skeletal and smooth muscle, mechanisms of muscle contraction and energy requirements. Motor units, muscle twitch, muscle tone, tetanus). 8. Endocrinology (Neuroendocrine system, autonomic nervous system-endocrine glands binding. Cortex-limbic system-hypothalamus-hypophysis. Hormone receptors, hormone interaction. Mechanisms of hormone action. Thyroid hormones, pancreatic hormones, adrenal hormones (cortex, medulla), parathyroid hormones, sex hormones, tissue hormones.					
2.6.Format of instruction:	x lectures <input type="checkbox"/> seminars and workshops x exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities	Lectures: 1) Introduction, body fluids - 1 hours, 2) homeostasis, acid-base balance - 2 hours, 3) cells physiology - 2 hours, 4) blood physiology- 6 hours, 5) nervous system physiology - 5 hours 6) muscular system physiology - 4 hours 7) endocrinology - 10 hours Lab exercises: 1) general physiology - 4 hours, 2) body fluids - 4 hours; 3) blood physiology - 22 hours; 5) nervous system - 8 hours; 6) muscular system - 4 hours 7) endocrinology - 8 hours					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total	Class attendance	0.5	Research		Practical training	
	Experimental work		Report		Activity	1
	Essay		Seminar essay		(other)	
	Tests	1	Oral exam	3.5	(other)	

number of ECTS credits is equal to the ECTS value of the course)	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>1. lectures attending: During semester a student must attend 15 lecture lessons in order to gain minimal 3 points. The maximum number of points from this evaluation element is 6.</p> <p>2. lab exercises attending: During semester a student must attend 36 exercise lessons in order to gain minimal 8 points. The maximum number of points from this evaluation element is 12. When the student upon the completion of teaching in the first try makes up for nonattendance of an exercise (excused and approved), points are added to the gained ones. If the student makes up for the unattended lessons in further tries the points do not count.</p> <p>3. activity during lab exercises: During the practical part of the lesson (exercises), which is 50 hours of teaching, the student must successfully complete scheduled tasks and receive teacher's signature for the completed assignments. Each neatly done and signed task is worth 0.3 points. During the exercise the student can achieve a total of 4.2 (4) points. During the course, the student's activity is evaluated during the exercises. For six positive answers, the student earns an additional 6 points. During the practical part of the course, the student must achieve a minimum of 5 points and can achieve the maximum of 10 points.</p> <p>4. continuous assessment: During the „Physiology of domestic animals I” course two tests will be organized. The first test comprises general physiology and blood physiology, and the second one comprises muscle and nervous systems physiology. At each test a student must earn minimal 10 points in order to gain 20 points. The maximum number of points from this evaluation element is 32 points. In case a student does not gain the required point during the course he/she has the right to take three times the makeup preliminary exam, which will be organized.</p> <p>5. final exam: The final exam starts with a student's short analysis of results gained from the first four evaluation elements. At the final exam the student answers the questions in oral form. The final exam comprises the material from endocrinology and it estimates the capability of a student to connect physiological processes. The maximum gained number of points at the final exam is 40 points. Regardless the gained number of points from the first four evaluation elements, the student must show minimal knowledge at the final exam in order to earn minimal 24 points. In case the student does not satisfy at the final part of the exam, the lecturer determines time for re-examination</p>					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Cunningham, J. G.: Textbook of veterinary physiology. 3rd edition, W. B. Saunders Company, 2002.			1		
	Dukes' physiology of domestic animals (William O. Reece, Ed.). The 12th ed. Cornell University Press. Ithaca and London, 2004.			1		
	Sjaastad Ø. V., O. Sand, K. Hove: Physiology of Domestic Animals. The 12nd ed. Scandinavian veterinary press, 2010.			2		

2.12. Optional literature (at the time of submission of study programme proposal)	<p>Feldman, B. F., J. G. Zinkl, N. C. Jain: Schalm's Veterinary Hematology. 5th ed. Lippincott Williams & Wilkins, 2000.</p> <p>Kaneko, J. J., J. W. Harvey, M. L. Bruss: Clinical Biochemistry of Domestic Animals. Academic Press. San Diego, Boston, New York, Sydney, Tokyo, 1987.</p> <p>Payne, J. M., S. Payne: The Metabolic Profile Test. Oxford University Press. Oxford, New York, Tokyo, 1987.</p> <p>Schmidt-Nielsen, K.: Animal Physiology. Adaptation and Environment. Cambridge University Press, 1997.</p> <p>Sturkie, P. D.: Avian Physiology. Springer Verlag. New York, Berlin, Heidelberg, Tokyo, 2000.</p>		
2.13 Quality assurance methods that ensure the acquisition of exit competences	<p>Students' work quality monitoring during the semester, which provides acquisition of exit competencies is carried out through continuous assessment and skills during the execution of all forms of teaching. Thus, acquired knowledge and skills are validated on exercises and tests and especially through the final written exam</p>		
2.14 Other (as the proposer wishes to add)	/		

PHYSIOLOGY OF DOMESTIC ANIMALS II

1. GENERAL INFORMATION			
1.1. Course teacher	Ana Shek Vugrovečki, PhD, assistant professor Ivona Žura Žaja, PhD, assistant professor - deputy	1.6. Year of the study programme	II.
1.2. Name of the course	Physiology of domestic animals II	1.7. Credits (ECTS)	10
1.3. Associate teachers	Jasna Aladrović, PhD, associate professor; Ana Shek-Vugrovečki, PhD, assistant professor; Ivona Žura Žaja, PhD, assistant professor; Lana Pađen, PhD, assistant professor; Jadranka Pejaković Hlede, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	45+25+60
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)
2. COUSE DESCRIPTION			
2.1. Course objectives	Course Physiology of domestic animals II qualifies students for progressive development of knowledge and understanding of basic principles and facts of physiological processes from cell to the total body, understanding and correlating of regulatory mechanisms, understanding of homeostasis keeping, acid-base balance, development of knowledge and skills related to body liquids in special regard of blood physiology, understanding of physiological function of muscle/nervous system, physiological function of hormones in context of the whole homeostatic system. The goal is to provide the progressive development of skills in collecting, preparing, and interpreting the results of different samples analysis, to provide modern trends in veterinary physiology so that students will achieve a working knowledge of physiology; development of abilities for interpretation, and conclusion about information; abilities of searching for information in literature.		
2.2. Course enrolment requirements and entry competences required for the course	Enrolment requirements: completed course Physiology of domestic animals I Entry competences: - acquired knowledge and skills in Physiology of domestic animals I		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the	After successfully mastering the course students will be able to: 1. describe physiology of heart and cardiovascular system, respiration, digestion in monogastric animals and ruminants, excretion, the metabolism		

course (4 to 10 learning outcomes)	of nutrients, minerals and vitamins, physiological processes of oviposition, lactation and thermoregulation; 2. associate regulatory mechanisms of specific body systems; 3. interpret functions of different body systems during different physiological conditions; 4. prepare biological samples for various laboratory analyses; 5. know the concept of modern diagnostic tools and machines (haematological and biochemical analyser, spirometry, ECG, EMG, EEG); 6. analyse and interpret the results of laboratory tests
2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>1. Cardiovascular system (Physiological features of cardiovascular system in domestic animals, physiology of cardiac muscle, heart as a pump, rhythmic excitation of the heart. Cardiac cycle – electric changes, mechanic changes, pressure and volume changes, sound changes; blood flow through heart. Striking volume, minute volume, regulation of heart pumping - auto regulation, humoral, endocrine and nervous regulation, cardiovascular receptors. Electrocardiography (Einthoven's triangle, uni – and bipolar electrocardiography). Energetic of heart pumping. Arterial and venous blood pressure, blood pressure regulation. Measurement of blood pressure and pulse - Valsalvin maneuver. Hemodynamics, peripheral circulation – arterial, capillary and venous blood flow, peripheral circulation regulation, metabolism of substances and liquids in tissues, lymph. Special blood flows: pulmonary, coronary, hepatic, brain circulation).</p> <p>2. Respiration (Ventilation and lung mechanics, partial pressures lungs-blood, transport of oxygen and carbon dioxide in blood. Control of respiration; respiratory centres, factors that influence on respiratory centres. External breathing; inspiration, expiration, respiratory volumes, alveolar ventilation, intrapulmonary pressure and pressure in thorax).</p> <p>3. Digestion in mouth and simple stomach (Function of digestion. Physiological features of digestion in carnivores, herbivores and omnivores. Food taking, swallowing, salivation, regulation of salivation, gastric motility, regulation of gastric secretion. Store, mix, and dissolve food in stomach, emptying of dissolved food into small intestine. Vomiting.</p> <p>4. Digestion in ruminants (Basic principles of symbiosis ruminant-micro population, motility; relation water-dry substances, oesophagus, rumination, gasses in rumen; influence of pH, nourishment, elimination, role of bacteria and infusoria in digestion, efficacy of digestion in rumen. Digestion of carbohydrates, proteins and fats, ruminohepatic circle of nitrogen, synthesis of vitamins, metabolic pathways of low fatty acids, digestion in abomasums).</p> <p>5. Digestion in small and large intestine (Relation stomach - duodenum, pH change and influence of food, secretion of bile and pancreatic juice, regulation of their secretion. Gutt polypeptides. Secretion of small and large intestine, digestion and absorption).</p> <p>6. Excretion (Role of excretory organs; general and special functions, formation of urine, nephron physiology. Regulation of primary and secondary urine secretion, counter current mechanism, urination physiology):</p> <p>7. Metabolism of carbohydrate (Regulation of anaerobic and aerobic glycolysis; metabolic pathway of lactate, Kory cycle, regulation of gluconeogenesis; ruminants, carnivores. Pentose-phosphate pathway, glucuronic acid cycle; regulation, role, glycogenic reserve).</p> <p>8. Protein metabolism (Classification of body proteins, half-life of body proteins, protein synthesis and degradation in different animal species; regulation. Specificities of non-protein nitrogen elimination, regulation of biosynthesis; hormonal, genetic, energetic, by nourishment).</p> <p>9. Metabolism of fats (Regulation of lypogeneseis-lypolisis relation, possible pathways of AcCoA; receptive capacities – ketogeneses, cholesterinogenesis. Body fats – transport fats relation. Saturation of fat acids, lypolisis).</p> <p>10. Metabolism of minerals (Role of minerals in synthesis and metabolism of tissues; microelements, macro elements, minerals as coenzymes, mechanism of excretion).</p> <p>11. Metabolism of vitamins (Role of</p>

	<p>vitamins in metabolic processes, hydro soluble vs. liposoluble vitamins, absorption of vitamins, deposition in the body and vitamins excretion). 12. Antioxidative status (Free radical production during the metabolic processes, mechanism of free radicals action, effect of harm free radical activity, in vivo antioxidants, antioxidative enzymes, nonenzymatic antioxidative molecules, oxidative stress). 13. Bioenergetics (Basic principles of bioenergetics and metabolic rate, brutto energy of food, digestible energy, metabolizable energy, specific dynamic action of food, resting energy metabolism, importance of ATP, efficacy of production processes, biocaloimetry, respiratory quotient and its interpretation). 14. Exercise physiology (Energetic metabolism during exercise. Neuromuscular aspect of exercise. Exercise effect on cardiovascular system. Effect of exercising on breathing system. 15. Physiology of oviposition (Composition of egg, egg formation as enriched egg-cell, oviposition, control of oviposition). 16. Physiology of lactation (Composition of milk in different animal species, mamogenesis, lactogenesis, metabolism of mammary gland). 17. Thermoregulation (Poikilotherms, homeotherms, hibernation, thermoreceptors, organisms defence of hypothermia and hyperthermia). 18. Physiology of skin (Physiological features of skin and mucous membrane, skin glands). 19. Physiology of reproduction (Hormonal regulation, male and female reproductive system, pregnancy). 20. Behaviour in domestic animals, memory and learning (The role of the hormone system in food intake, sexual behavior, parental behavior and learning. Immediate, working and long-term memory).</p>						
2.6.Format of instruction:	<p>x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work</p>	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:				
2.8.Student responsibilities							
2.9.Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	1,8	Research		Practical training		
	Experimental work		Report		Seminars		
	Essay		Seminar essay		conversation		
	Tests	3,2	Oral	4	Activity	1	
	Written exam		Project		(other)		
2.10. Grading and evaluating student work in class and at the final exam	<p>Evaluation elements : 1) lectures attending, 2) participation during seminars, 3) lab exercises attending; 4) exercise and seminars attending; 5) continuous assessment; 6) final exam</p> <ol style="list-style-type: none"> lectures attending: During semester a student must attend 23 lecture lessons in order to gain minimum of 3 points. The maximum points from this evaluation element is 6. seminars attending: During the course the student must attend 18 seminars in order to achieve a minimum of 4 points. The maximum points gained in this element is 6 points. After completion of the classes student can compensate absent seminar (which was previously justified, and compensation is granted) and points will be attributed to the other points. When a student compensates 						

	<p>absentee classes in subsequent attempts, points will not be attributed.</p> <p>3. lab exercises attending: During the course the student must be present at the 44 hours of lab exercises to get minimum of 4 points. The maximum points gained in this element is 6 points. After completion of the classes a student can compensate absentee exercise (which was previously justified, and compensation is granted) If it is compensated in the first attempt, points will be attributed to the other points. When a student compensates absentee classes in subsequent attempts, points will not be attributed.</p> <p>4. activity on lab exercises and seminars: During the 60 hours of the exercises classes, the student must complete the assigned tasks for which he / she is given the signature of the teacher (associate). A student can earn up to 2 points per seminar, and a total of 4 points for producing and successfully presenting a seminar paper. For six positive answers (three oral and three written) the student earns an additional 6 points. During the course of seminars and exercises, the student must achieve at least 5 points and a maximum of 10 points.</p> <p>5. continuous assessment: During the course of Physiology of domestic animals II . two lab tests will be organized . The first test covers the physiology of the cardiovascular and respiratory systems, and the second test covers the physiology of digestion and excretion. At each test a student must achieve a minimum of 10 points in order to achieve the required 20 points. The maximum number of points in this element is 32 points. Students who do not achieve the necessary points during the teaching have the right to access test three times, which will be organized at a specific time.</p> <p>6. final exam: The final exam begins with brief analysis of the results from the first five elements of evaluation for each student . On the final exam, the student responds to the questions orally. At the final exam, the questions are from every area of the curriculum that the student has attended the lectures and seminars, and each question is scored separately. The maximum number of points on the final exam is 40 points. Regardless of the credits from the first five elements of evaluation, student has to demonstrate minimal knowledge on the final exam in order to achieve the minimum of 24 points. If a student did not pass the final exam, it can be reassessed again at a specific time.</p>
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2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Cunningham, J. G.: Textbook of veterinary physiology. 3rd edition, W. B. Saunders Company, 2002.	1	
	Dukes' physiology of domestic animals (William O. Reece, Ed.). The 12th ed. Cornell University Press. Ithaca and London, 2004.	1	

	Sjaastad Ø. V., O. Sand, K. Hove: Physiology of Domestic Animals. The 12nd ed. Scandinavian veterinary press, 2010.	1	
2.12.Optional literature (at the time of submission of study programme proposal)	<p>Feldman, B. F.,J. G. Zinkl, N. C. Jain: Schalm´s Veterinary Hematology. 5th ed. Lippincott Williams&Wilkins, 2000.</p> <p>Kaneko, J. J., J. W. Harvey, M. L. Bruss: Clinical Biochemistry of Domestic Animals. Academic Press. San Diego, Boston, New York, Sydney, Tokyo, 1987.</p> <p>Payne, J. M., S. Payne: The Metabolic Profile Test. Oxford University Press. Oxford, New York, Tokyo, 1987.</p> <p>Schmidt-Nielsen, K.: Animal Physiology. Adaptation and Environment. Cambridge University Press, 1997.</p> <p>Sturkie, P. D.: Avian Physiology. Springer Verlag. New York, Berlin, Heidelberg, Tokyo, 2000.</p>		
a. Quality assurance methods that ensure the acquisition of exit competences	Students' work quality monitoring during the semester, which provides acquisition of exit competencies is carried out through continuous assessment and skills during the execution of all forms of teaching. Thus, acquired knowledge and skills are validated on exercises and tests and especially through the final written exam.		
b. Other (as the proposer wishes to add)	/		

VETERINARY IMMUNOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Nevenka Rudan	1.6. Year of the study programme	II.
1.2. Name of the course	Veterinary Immunology	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Full Prof. Ljiljana Pinter, Luka Radmanić, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 + 0 + 15 + 0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	-
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COURSE DESCRIPTION			
2.1. Course objectives	The veterinary immunology course is taught to second-year veterinary medical students via fifteen didactic lectures. Students get familiar with basic immunology knowledge, infectious immunology and allergology, basic knowledge of autoimmune diseases and immunomodulation. Veterinary immunology is an important preclinical course which enables student to understand other courses such as microbiology, pathology, pharmacology, internal diseases and infectious diseases, particularly regards to pathogenesis and infectious diseases diagnostics and hypersensitivity, carrying out of immunoprophylaxis and assessment of immune status. During the study students become familiar with vaccines and their usage, simple immunology diagnostic procedures and use of commercially available vaccines.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	At the course students of veterinary medicine get familiar with infectious immunology and allergology, basic knowledge of autoimmune diseases and immunomodulation. Veterinary immunology is an important preclinical course which enables student to understand other courses such as microbiology, pathology, pharmacology, internal diseases and infectious diseases, particularly as regards pathogenesis and infectious diseases diagnostics and hypersensitivity, carrying out of immunoprophylaxis and immune status. During the study students become familiar with vaccines and their usage, simple immunology diagnostic procedures and use of commercially available vaccines.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>knowledge of innate immunity mechanisms, inflammation and its role in course of immune response cells of immune system and their enrolment in immune reaction, adaptive immunity to microbes and parasites, mucosal immunity,</p> <p>understand function and role of complement system, cytokines, antigens, dendritic cells, major histocompatibility complex, cells and tissues of the immune system,</p> <p>understand mechanisms of adaptive immunity, antibody synthesis, immunity of fetus and newborn animals, mucosal immunity,</p> <p>use adoptive knowledge about hypersensitivity mechanisms, production and usage of vaccines, adjuvants and their immunomodulatory activity.</p>		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Immune system overview: Innate and adaptive immunity (2 hours lectures) 2. Antigens and antibodies (2 hours lectures) 3. Complement system; Cells and Tissues of the Immune System (2 hours lectures) 4. The Major Histocompatibility Complex; Antigen Presentation and Cytokines (2 hours lectures) 5. The Biology of T Lymphocytes; The Biology of B Lymphocytes (2 hours lectures) 6. Hypersensitivity Mechanisms (2 hours lectures) 7. Vaccination (2 hours lectures) 8. Immunotolerance (1 hour lecture) 1. Antigen, antibody (2 hours exercises) 2. Paired sera, titer (2 hours exercises) 3. Agglutination, precipitation (2 hours exercises) 4. Preliminary exam; immunofluorescence (2 hours exercises) 5. ELISA, Complement-fixation test (2 hours exercises) 6. Hemagglutination-inhibition assay (2 hours exercises) 7. Virus neutralization test (2 hours exercises) 8. Preliminary exam; vaccination (1 hour exercises)					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.45	Research		Practical training	
	Experimental work		Report		Participation at exercises	0.25
	Essay		Seminar essay		(other)	
	Tests	0.8	Oral exam		(other)	
	Written exam	1.0	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	TYPE OF ACTIVITY	MINIMAL NUMBER OF POINTS		MAXIMAL NUMBER OF POINTS		
	Attending lectures	3		6		
	(15 lecture hours)	coefficient=0.4 (8 hours x 0.4=3.2 points)		6 points:15 hours=0.4 (coefficient) 15 hours x 0.4=6 points		
		A student must attend a minimum of 8 lecture hours in order to gain a minimum of 3 points				
	Attending exercises	8		12		
	(15 exercise hours)	coefficient=0.8 (10 hours x 0.8=8 points)		12 points:15 hours =0.8 (coefficient) 15 hours x 0.8=12 points		
		A student must attend a minimum of 10 exercise hours in order to gain a minimum of 8 points				
	Participation at exercises	5		10		

	Attendance at all exercises (5 points) Oral questions (2.5 points each)	Attendance at all exercises (5 points) or 5 points from answers to oral questions A student must attend all exercises or give 2 correct answers to oral questions in order to earn a minimum of 5 points	Attendance of all exercises (5 points) plus 5 points from answers to oral questions = 10 points or 4 answers x 2.5 points = 10 points	
	Continuous knowledge checking	20	32	
	2 preliminary written exams, 16 questions each 1 question = 1 point 32 questions x 1.0 = 32 points	coefficient=1.0 (20 answers x 1.0 = 20 points) A student must give correct answers to 20 questions in order to gain a minimum of 20 points	32 points:32 questions = 1.0 (coefficient) 32 correct answers x 1.0 = 32 points	
	Final exam	24	40	
	Written exam 40 questions, a total of 40 points 1 question =1 point	coefficient = 1.0 (24 answers x 1.0 = 24 points)	40 points:40 questions =1.0 (coefficient) 40 correct answers x 1.0 = 40 points	
	40 questions x 1.0 point = 40 points	A student must give correct answers to 24 questions in order to gain a minimum of 24 points		
	TOTAL	60	100	
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Michael J. Day, Ronald D. Schultz: „Veterinary Immunology, Principles and Practice“, Manson Publishing, 2011.		0	
2.12. Optional literature (at the time of submission of study programme proposal)	Tizard Ian: Veterinary Immunology. 9th ed. W.B. Saunders Company. A Harcourt Health Sciences Company. Philadelphia, London, Toronto, Montreal, Sydney, Tokyo, 2012.			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continous checking via disscusion plus two written preliminary exams.			
2.14. Other (as the proposer wishes to add)				

LIST OF OBLIGATORY SUBJECTS – 3rd STUDY YEAR

Obligatory Subjects – 3rd study year

Clinical Propedeutics

Communication Skills in Veterinary Medicine

General Veterinary Pathology

Parasitology and Parasitic Diseases

Pathophysiology I

Pathophysiology II

Pharmacology

Radiation Hygiene

Special Microbiology

Special Veterinary Pathology

CLINICAL PROPEDEUTICS

1. GENERAL INFORMATION			
1.1. Course teacher	Ivana Kiš, associate. professor	1.6. Year of the study programme	III
1.2. Name of the course	Clinical Propedeutics	1.7. Credits (ECTS)	8
1.3. Associate teachers	prof. Vesna Matijatko, PhD; prof. Nikša Lemo, PhD; prof. Damjan Gračner, PhD; prof. Nada Kučer, PhD; assoc. prof. Ivana Kiš, PhD; ass. prof. Mirna Brkljačić, PhD; ass. prof. Marin Torti, PhD; ass. prof. Martina Crnogaj, PhD; ass. prof. Iva Šmit, PhD; ass. prof. Jelena Selanec, PhD; ass. prof. Darko Grden, PhD; Ines Jović, DVM, Filip Kajin, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	L 45 + E 60
Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	6 students
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	There are no online lectures.
2. COUSE DESCRIPTION			
2.1. Course objectives	The objective of the course is to acquire basic knowledge and skills necessary to perform physical examination of the domestic animals, compose the list of clinical problems and form the diagnostic plan. Furthermore, the objective of the course is to become acquainted with basic additional diagnostic methods and interpretation of laboratory and other additional findings. Knowledge and skills acquired through participation in this course prepare the students to be able to work in clinical departments and give them base for further learning and specialization in clinical disciplines. Preparation of domestic animals and little carnivores for clinical exam, recognition of internal diseases symptoms using inspection, palpation, percussion and auscultation, sense of smell and measuring (changes of body weight, retarded growth, weakness and syncope, anorexia and polyphagia, changes of behaviour, pain, hypothermia and hyperthermia, cough, dyspnoea, ascites, peritonitis and other causes of abdominal distention, cardiopulmonary arrest, sneezing and nasal discharge, abnormal heart sounds and heart murmurs, EKG, changed pulse qualities, oedema, liquidothorax, vomiting, regurgitation and dysphagia, diarrhoea, constipation, tenesmi, incontinence, melanea, haematochesia, ptyalism, joint effusion, lameness, tremor, ataxia, paresis, paralysis, stupor and coma, epileptiform seizures, polyuria, polydipsia, incontinence, enuresis, dysuria, urinary tract obstruction, urinalysis, vaginal and preputial discharge, anaemia, cyanosis, jaundice, skin changes (alopecia, pruritus, lumps), lymphadenopathies, performing of clinical lab studies of animals according to body systems, intubation, catheterization, venepuncture, rectal examination, therapy preparation for application and i/m, s/c, i/v application, infusion therapy.		
2.2. Course enrolment requirements and entry competences	Anatomy of domestic animals I, II and III, Histology and embriology		

required for the course						
2.3. Learning outcomes at the level of the programme to which the course contributes	Students will be able to take history, and correctly approach to large and small animals and perform clinical and neurological examination in a safe manner. The knowledge obtained during clinical propedeutics shall be the basis for all other clinical subjects (eg. Internal diseases, Diseases and treatment of dogs and cats II, Herd medicine, Equine diseases).					
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1.Students shall be able to take adequate disease history. 2. Students will be able to make clinical examination 3. Students will have adequate knowledge for basic differential diagnostics of most common clinical problems. 4. Students shall be able to perform additional clinical examinations (depending of the organ system involved). 5. Students will be able to decide which advanced additional clinical methods of examination should be employed and be able to partly conduct those methods, eg. blood analysis).					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Introduction to clinical propedeutics, methods of clinical examination, examination of digestive tract of domestic animals, examination of circulation, examination of respiratory system, examination of urinary system, examination of neurologic system, examination of skin, application of medication.					
2.6. Format of instruction:	+ lectures <input type="checkbox"/> seminars and workshops + exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work				+ independent assignments <input type="checkbox"/> multimedia and the internet + laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,44	Research		Practical training	
	Experimental work		Report		Activity at classes	0,8
	Essay		Seminar essay		(other)	
	Tests	2,56	Oral exam	3,2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Radostits, O., Mayhew, I., Houston, D. (2001): Veterinary clinical examination and diagnosis. Saunders, Philadelphia.					
	Rijnberk, A., van Sluijs, F. J.(2009): Medical history and physical examination in companion animals. Saunders Elsevier, Houten					
2.12. Optional literature (at the time of submission of	Bexfield, N., Lee, K. (2010): BSAVA Guide to procedures in small animal practice. BSAVA, Quedgeley.					

study programme proposal)	<p>Rockett, J., Bosted, S. (2016): Veterinary clinical procedures in large animal practice. Cengage Learning, Boston.</p> <p>Speirs, V. E., Wrigley, R. H. (1997): Clinical examination of horses. Saunders, Pennsylvania.</p> <p>Jackson, P. G. G., P. D. Cockroft (2002): Clinical examination of farm animals. Blackwell, Oxford.</p> <p>Aspinall, V., Aspinall, R. (2013): Clinical procedures in small animal veterinary practice. Saunders Elsevier, Edinburgh.</p> <p>Costa, L. R. R., Paradis, M. R. (2018): Clinical procedures in the horse. Willey Blackwell, New Delhi.</p> <p>Englar, R. E. (2017): Performing the small animal physical examination. Willey Blackwell, New York.</p>
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2.13. Quality assurance methods that ensure the acquisition of exit competences	ACTIVITIES	MINIMAL SCORE	MAXIMAL SCORE
	Lecture attendance	23 lectures: 3 points (coefficient 0,133)	45 lectures: 6 points (coefficient 0,133)
	Exercise attendance Student has to be present minimally at 67% of exercises	42 hours: 8 points (coefficient 0,2)	60 hours: 12 points (coefficient 0,2)
	Activity at exercises 60 hours of exercises, each student is graded according to his/hers activity	5 (coefficient 0,1667)	10 (coefficient 0,1667)
	Continuous monitoring of knowledge		
	Colloquium Consists of 5 questions, for each question student can obtain minimally 4, and maximally 6,4 points	20	32
	Oral exam	Student can apply for final exam if he/she has obtained totally at least 36 points	
	Final (oral) exam consists of 6 questions For each question student can minimally obtain 4, and maximally 6,4 points	24	40
Total points for determining the grade of each student	Points up to 59 60 - 76 77 - 84 85 - 92 93 - 100	Grade 1 2 3 4 5	
2.14. Other (as the proposer wishes to add)			

COMMUNICATION SKILLS IN VETERINARY MEDICINE

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Danijel Labaš, Ph.D., associate professor	1.6. Year of the study	3rd
1.2. Name of the course	Communication Skills in Veterinary Medicine	1.7. ECTS credits	1
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	L16+E6+6e-learning
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Obligatory subjects	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	/
2. COURSE DESCRIPTION			
2.1. Course objectives	The main goal of the course is to familiarize students with communication science as an interdisciplinary and integrative knowledge of its postulates in order to solve and improve their own communication, while the specific aims of the course are the acquisition of communication skills at interpersonal, social and media level, with the acquisition of knowledge of the correct relationship and use of verbal and nonverbal communication. Communication and relationship between veterinarians and patient owners, as well as other public (especially media), are extremely important and have a number of effects on treatment outcomes as well as satisfaction with treatment, compatibility, clinical outcome and quality of life, patient safety, teamwork, cultural sensitivity and reduced the number of complaints about the veterinarians work, and equally affect the presentation of a real image of the profession in public.		
2.2. Enrolment requirements and/or entry competences required for the course	Enrolled integrated study.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Students will be familiar with the anthropological, communicational and psychological approach to multiple levels of communication. In particular, they will be able to properly use verbal communication and learn to properly evaluate and interpret nonverbal communication in different social and cultural environments, with particular emphasis on the relationship between the veterinarian and the client's owner. One of the more sensitive areas of biomedicine in terms of the importance of quality communication is access to communication in severe and incurable diseases, and particularly challenging opportunities for the clients to convey bad news, to recognize his emotional reactions, to listen actively, to include him in communication, to discuss the prognosis and the risk, assist in making a decision or encouraging its acceptance. But no less important is the public reaction to complaints about the profession, mostly in the media. Students will therefore be able to use the acquired communicative knowledge and develop the skills of critical observation, presentation and analysis of contemporary communication dynamics and models, particularly in interpersonal communication, as well as communication in public and the media, and will acquire the knowledge and skills required for public relations.		
2.4. Expected learning outcomes at	Students will be able to: analyze and compare various types of communication;		

the level of the course (3-10 learning outcomes)	<p>correctly interpret the underlying concepts - intrapersonal, interpersonal, verbal, nonverbal, social and media communication;</p> <p>argue the importance of knowing the communication dynamics and challenges of communication in veterinary;</p> <p>to describe the role of verbal and non-verbal communication in everyday and business life and prepare to talk about giving diagnosis and therapy;</p> <p>analyze and interpret the verbal and non-verbal communication of their interlocutors;</p> <p>use the acquired knowledge about the relationship of interpersonal communication and communication in the business environment;</p> <p>to evaluate the quality of interpersonal communication;</p> <p>analyze and compare communication relationships in dialogue and persuasion in discussing the prognosis of treatment and risk communication;</p> <p>critically analyze and adopt the process of active listening in interpersonal diagnostic communication;</p> <p>to argue the reasons why it is necessary to know the communication dynamics in the everyday and business environment and how to use them in relation between veterinarian and owner of the client;</p> <p>critical approach to establishing communication with the public and the media and analyzing crisis communication strategies.</p>									
2.5. Course content (syllabus)										
2.6. Format of instruction:	<input type="checkbox"/> x lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> x exercises <input type="checkbox"/> online in entirety <input type="checkbox"/> x partial e-learning <input type="checkbox"/> field work					<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			2.7. Comments:	
2.8. Student responsibilities										
2.9. Monitoring student work	Class attendance	YES	NO	Research	YES	NO	Oral exam	YES	NO	
	Experimental work	YES	NO	Report	YES	NO	(other)	YES	NO	
	Essay	YES	NO	Seminar paper	YES	NO	(other)	YES	NO	
	Preliminary exam	YES	NO	Practical work	YES	NO	(other)	YES	NO	
	Project	YES	NO	Written exam	YES	NO	ECTS (total)	1		
2.11. Required literature (available in the library and/or via other media)	Title						Number of copies in the library	Availability via other media		
	LITTLEJOHN, S. W. – FOSS A. K., <i>Theories of Human Communication</i> , Wadsworth Publishing Company, Wadshwort 2011 (10th or later edition), pp. 3-41; 79-122; 179-228.									
	LABAŠ, D., <i>Nonverbal communication: The Body as an Extention of the Soul</i> in: Djurdja Bartlett (ed.), <i>Body in Transition</i> , Faculty of Textile Technology, University of Zagreb, Department of Fashion Design, Zagreb 1999, 74-83.									
	ADAMS, C. L, FRANKELM R. M., It May Be a Dog's Life But the Relationship with Her Owners Is Also Key to Her Health and Well Being: Communication in Veterinary Medicine, <i>Vet Clin Small Anim</i> , 37 (2007) 1-17.									

	HAMOOD, W. J., CHUR-HANSEN, A., McARTHUR, M. L., A qualitative study to explore communication skills in veterinary medical education, <i>International Journal of Medical Education</i> , 2014;5:193-198.		
2.12. Optional literature (name the title)	<p>McDermott, M. P., Tischler, V. A., Cobb M. A, Robbé I. J., Dean, R. S., Veterinarian-Client Communication Skills: Current State, Relevance, and Opportunities for Improvement, <i>J Vet Med Educ.</i>, 42(2015)4:305-14</p> <p>Shaw, J. R., Four Core Communication Skills of Highly Effective Practitioners, <i>Veterinary Clinics of North America: Small Animal Practice</i>, 36(2006)2: 385-396.</p> <p>Shaw J. R., Barley, G. E., Hill, A. E., Larson, S., Roter, D. L., Communication skills education onsite in a veterinary practice, <i>Patient Education and Counseling</i>, 80(2010)3: 337-344.</p> <p>Shaw, J. R., Bonnett, B. N., Adams, C. L., Roter, D. L., Veterinarian-client-patient communication patterns used during clinical appointments in companion animal practice, <i>Journal of the American Veterinary Medical Association</i>, 228(2006)5: 714-721.</p> <p>World Organisation for Animal Health, <i>Communication Handbook Veterinary Services</i>, World Organisation for Animal Health, 2015 (dostupan pdf svim studentima).</p>		

GENERAL VETERINARY PATHOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Andrea Gudan Kurilj, DVM, PhD, DECVP	1.6. Year of the study programme	3 rd
1.2. Name of the course	General veterinary pathology	1.7. Credits (ECTS)	7
1.3. Associate teachers	Professor Željko Grabarević DVM, PhD; Associate professor Marko Hohšteter, DVM, PhD; Assistant professor Ivan-Conrado Šoštarić- Zuckermann, DVM, PhD; Doroteja Huber, DVM, PhD; Lidija Medven Zagradišnik, DVM; Ivana Mihoković Buhin, DVM.	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+60+0+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Active	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	Students gain knowledge on basic pathology including general aetiology, circulatory disturbances, cell injury and cell death, discyclia, accommodation processes and hypoxia, organisation processes and healing, inflammation and reparation, tumours and hereditary anomalies. Students learn some basic methods used in modern pathology, like autopsy and taking materials for additional laboratory research, especially emphasising pathohistological research.		
2.2. Course enrolment requirements and entry competences required for the course	Previous passing courses: Anatomy with organogenesis of domestic animals 1,2,3 and Histology and embriology.		
2.3. Learning outcomes at the level of the programme to which the course contributes	At the end of the course students will get knowledge in general pathology for further performing of education in other clinical subjects. The final goal upon the end of the studying is to be able to recognise a pathological process, make a right diagnosis and give the proper therapy, or if the animal perishes to get the right diagnosis in a proper way (by autopsy and other laboratory studies) thus act as a preventive measure for other animals.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	At the end of the course students will: get knowledge in general pathology for further performing of education in other clinical subjects be able to recognise a pathological process be able to make a right diagnosis for a purpose of therapy if the animal perishes to get the right diagnosis in a proper way (by autopsy and other laboratory studies) thus act as a preventive measure for other animals		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	LECTURES:		
	Methodological unit	Contents	No. of hours
	Introduction and general aethiology	Introduction and general aethiology	1 hr
	Circulatory disturbances	General circulatory disturbances and haemostasis	1 hr
	Circulatory disturbances	Haemostasis; oedema, hyperaemia, haemorrhages	2 hrs
	Circulatory disturbances	Thrombosis, DIK, embolia	2 hrs
	Circulatory disturbances	Infarction and shock	1 hrs
	Reversible cell injury	Cell adaptation	2 hrs
	Chronic cell injury and adaptation	Intracellular accumulations (liids, glycogen, hyaline, and the other cell inclusions); extracellular accumulations (hyaline, amyloid and the other accumulations); pathological calcification, heterotopic bone, pigments	2 hrs
	Cell death	Irreversible cell injury Necrosis, apoptosis	2 hrs
	Inflammation	Historical datas, definition, characteristics of the inflammation, cardinal signs of inflammation, triad of inflammation, haemodynamic changes	2 hrs
	Inflammation	Cellular reaction and phagocytosis, byomediators of inflammation	2 hrs
	Inflammation	Nomenclature of inflammation, clasiffication of inflammation according to affected tissue, classification of inflammation according to characters	2 hrs
	Chronic inflammation	Mechanisms of chronic inflammation, granulomatous inflammations, wound healing and angiogenesis	2 hrs
	Basic immunopathology	Hypersensitivity reactions	2 hrs
	Basic immunopathology	Mechanisms of genesis of autoimmune diseases; amyloidosis	2 hrs
	Tumors	Definition, general characteristics, types of tumors	2 hrs
	Tumors	Nomenclature, characteristics, tumor growth	2 hrs
	Tumors	Grading of tumors, oncogenesys, paraneoplastic syndrome	2 hrs
	PRACTICALS:		
Necropsy: necropsy technique and recognition of pathologic changes – 30h			
2.6. Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	X independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:

2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,26	Research		Practical training	
	Experimental work		Report		Activity	0,7
	Essay		Seminar essay		(other)	
	Tests	2,24	Oral exam	2,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	MINIMAL NUMBER OF POINTS			MAXIMAL NUMBER OF POINTS	
	Attending lectures	3			6	
	The total of 30 lecture hours	(each particular lecture hour is summed as 0,2 point)				
		A student must attend minimal 15 lecture hours in order to gain 3 minimal points;				
	Attending practicals	8			12	
	Total of 60 exercise hours	A student must attend minimal 42 exercise hours in order to gain 8 minimal points;				
	Participation at practicals	5			10	
	<p>Every student has the opportunity to carry out two autopsies, success at each is awarded with 0 to 5 points. (0 points= autopsy not carried out; 1 point= autopsy carried out, but insufficient knowledge of theory and technique; 2 points= autopsy carried out, but insufficient knowledge of theory; 3 points= autopsy carried out, good knowledge of theory and technique; 4 points= autopsy carried out, very good knowledge of theory and technique; 5 points= autopsy carried out, excellent knowledge of theory and technique).</p> <p>The range of 5 to 10 points student achieves by combining ie. adding two values earned by autopsies. (eg. student carried out one autopsy at which he/she demonstrated good knowledge of theory and technique [3 points] and another one at which he/she demonstrated excellent knowledge of theory and technique [5 points], that way the student achieves 8 points from participation at exercises).</p>					

	Continuous knowledge checking	20 (Written preliminary exam from General pathology chapter "Inflammation" 10 points; Practical partial exam from autopsy 10 points)	32 (Written preliminary exam from General pathology chapters "Inflammation" 16 points; Practical partial exam from autopsy 16 points)
		<p>Written preliminary exam from General pathology chapters "Inflammation", is made out of 32 questions, each point score from the written preliminary exam is awarded with 0,5 point.</p> <p>Practical partial exam from autopsy is conducted by examining practical and theoretical knowledge of autopsy (0-9 points= student didn't demonstrate sufficient knowledge; 10 points= student demonstrated minimal knowledge; 11 points= student demonstrated sufficient knowledge; 12 points= student demonstrated satisfying knowledge; 13 points= student demonstrated good knowledge; 14 points= student demonstrated above average good knowledge; 15 points= student demonstrated very good knowledge; 16 points= student demonstrated excellent knowledge).</p>	
	Final exam	24	40
	Written and oral	(a student must show sufficient knowledge in order to gain minimal 24 points)	
	TOTAL	60	100
<p>Final exam: Minimal conditions for passing the first, second, third and fourth evaluation elements are all summed up and they are worth 36 points all together. In order to take the final exam a student must gain the minimum of 36 points. The final exam consists of a written and oral part. The written part of the exam will be in essay form. It will last 60 minutes and will consist of 8 questions. Each question will be scored with a maximum of 5 points. A minimum of 24 points is required for the passage in the written exam, and minimum of 2 points per each question should be achieved. Each question will have guidelines to clarify what is expected in the answer. After scoring a written part of the exam, students who achieve a minimum of 24 points can access the oral exam. Students who did not achieve the minimum score (24 points) on the written part of the exam receive a negative grade and will not be able to access the oral part of the exam. Questions at the oral part of the exam will be on the same principle as essay type question in the written part. The grade on the final exam is the one derived from the points that student has collected corresponding to questions from the written and oral part of the exam. The maximum amount of points in final exam is 40.</p>			

	Final evaluation: Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements (attending lectures, attending practicals, participation at practicals, continuing knowledge checking, final exam) according to the following table.			
	Points		Grade	
	up to 59		1 (F)	
	60-68		2 (E)	
	69-76		2 (D)	
	77-84		3 (C)	
	85-92		4 (B)	
	93-100		5 (A)	
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	V. Kumar, Abul K. Abbas, N. Fausto: Robbins and Cotran Pathologic Basis of Disease, 9 th . Elsevier Saunders, Philadelphia, 2015.			
	J. F. Zachary: Pathologic Basis of Disease, 6 th edition, Elsevier, Philadelphia, 2017.		5	
	D. O. Slauson, Cooper, B. J.: Mechanisms of Disease. 3 th edition, Mosby, St. Louis, 2002.			
2.12. Optional literature (at the time of submission of study programme proposal)	Grabarević, Željko i Sabočanec, Ruža (ur.): Osnove razudbe domaćih životinja. Medicinska naklada, Zagreb, 2016. Notes and presentations provided by lecturers.			
2.13. Quality assurance methods that ensure the acquisition of exit competences				
2.14. Other (as the proposer wishes to add)				

PARASITOLOGY AND PARASITIC DISEASES

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Albert Marinculić	1.6. Year of the study programme	third
1.2. Name of the course	Parasitology and Parasitic Diseases	1.7. Credits (ECTS)	7
1.3. Associate teachers	Assistant Lecturer Franjo Martinković, Assistant Lea Lovrić	1.8. Type of instruction (number of hours L + S + E + e-learning)	34+0+56+0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course		1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	Level1, 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	This course aims to provide core training in the theoretical and practical aspects of veterinary parasitology, covering the protozoan and metazoan parasites of animals and the vectors which transmit them, and equip students with specialised skills to enable them to pursue a career as a veterinary professional.		
2.2. Course enrolment requirements and entry competences required for the course	Regular knowledge achieved throughout the veterinary study.		
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>By the end of this course students should be able to demonstrate:</p> <p>detailed knowledge and understanding of the biology, life cycles, pathogenesis, and diagnosis of parasitic infections in animals and their relevance for human health and control</p> <p>detailed knowledge and understanding of the biology and strategies for control of animal parasites</p> <p>carry out practical laboratory identification of parasite stages</p> <p>specialised skills in: advanced diagnostic, chemotherapeutic, ecological and/or control aspects of the subject</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Understanding of biology and ecology of parasites and vectors of medical and veterinary medical importance, distinguishing and recognising of particular parasite groups as well as individual parasites and their development stages inside a group</p> <p>understanding of particular parasitic diseases spreading ways</p> <p>understanding of pathogenesis caused by parasites or their development stages</p> <p>improving of diagnostic skills and abilities in taking, preparing and searching of parasite samples,</p> <p>diagnosing and identification of parasites or their development stages,</p> <p>knowledge n treatment and prevention of particular parasitic diseases</p> <p>understanding of modern trends in veterinary parasitology.</p>		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES</p> <p>1st week Introduction to Veterinary Parasitology</p> <p>2nd week Coccidiosis in poultry and carnivores, Cyst Forming Coccidia</p> <p>3rd week Piroplasmiosis, Giardiosis, Cryptosporidiosis, Neosporosis</p> <p>4th week Leishmaniosis</p> <p>5th week Diseases caused by trematodes</p>		

	<p>6th week Diseases caused by tapeworms 7th week Tapeworms of carnivores 8th week Echinococcosis, Cysticercosis 9th week Introduction Nematodes,Ascaridae,Ancylostomidae,Oxyuridae 10th week Rhabditidae,Trichostrongylidae,Strongylidae 11th week Trichinellidae,Trichuridae 12 th week Dictyocaulidae,Metastrongylidae,Protostrongylidae, canine and feline lungworms 13th week Filariata, Spirurata, Arthropoda –Introduction 14th week , Acari, Ixodidae, Argasidae 15 th week Sarcoptidae, Psoroptidae, Demodicidae, Cheyletiidae, Trombicidae 16th week Insecta –Introduction,Malophaga, Anoplura, Siphonaptera,Tabanidae, Muscidae Calliphoridae, Sarcophagidae 17th week Oestridae, Hippoboscidae, Psychodidae,Culicidae, Ceratopogonidae,Cimicidae</p> <p>EXERCISES</p> <p>1st week Introduction to parasitology 2nd week Coccidiosis of poultry and carnivores 3rd week Cyst forming coccidia 4th week Piroplasmosis,Giardiosis, Leishmaniosis 5th week Trematodes 7th week Tapeworms of herbivores and carnivores 8th week Canine tapeworms and cestode larval stages T9th week Coprological examination 10th week Ascaridae, Oxyuridae, Ancylostomidae 11th week Strongylidae , Trichuris, Strongyloides, Lungworms 12th week Trichostrongylidae 13th week Diagnostics of trichinellosis 14th week Ticks 15th week Mange mites 16th week Biting lice, Sucking lice, Fleas 17th week Myasis</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	<p>During the Course a student must attend 8 lecture lessons. During the Exercise Session a student must attend 20 (out of 28) exercise programmes. During the exercise session a student must solve the given problems from 28 exercise lessons, and get a lecturer’s signature for the solved exercises. During the course session there will be 4 knowledge assessments with 20 questions. At the final exam a student answers the questions orally.</p>					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,26	Research		Practical training	
	Experimental work		Report		Activity (other)	0,7
	Essay		Seminar essay		(other)	
	Tests	2,24	Oral exam	2,8		
	Written exam		Project		(other)	
2.10. Grading and evaluating student						

work in class and at the final exam			
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the department library	Availability via other media
	Veterinary Clinical Parasitology, A. Zajac,G. Conboy,2012.	1	
	Essentials of Veterinary Parasitology, H.M. Eisheikha,N.A.Khan,2011	1	
	Focus on Small Animal Parasitology, M. Fisher, J. MacGarry,2006	1	
	Georgis Parasitology for Veterinarians, 10 th edition, 2017	1	
2.12. Optional literature (at the time of submission of study programme proposal)	Laboratory Procedures, 2002. 4 th edition C. M. Hendrix, Small animal clinical diagnosis by laboratory methods, Willard – Tvedten, 2004., 4.th edition		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Course information documentation, annual monitoring reports, student feedback by student questionnaire that cover all aspects of the course.		
2.14. Other (as the proposer wishes to add)			

PATHOPHYSIOLOGY I

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Mirna Robić	1.6. Year of the study programme	third
1.2. Name of the course	Pathophysiology I	1.7. Credits (ECTS)	2,5
1.3. Associate teachers	Prof. Nina Poljičak-Milas, Assoc. Prof. Romana Turk, Assoc. Prof. Maja Belić	1.8. Type of instruction (number of hours L + S + E + e-learning)	12+4+9
1.4. Study programme (undergraduate, graduate, integrated)	Integrated graduate and postgraduate study	1.9. Expected enrolment in the course	
1.5. Status of the course	compulsatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	During the course of Pathophysiology I students achieve knowledge on basic pathophysiological processes on cellular and tissue level during homeostatic disturbances in organism. Therefore the basis for better understanding disturbances in particular organs and organic system is achieved for understanding the course of Pathophysiology II.. During practical part of the course students gain skills in performing basic biochemical laboratory analyses, choosing the correct method and proper interpretation of achieved results.		
2.2. Course enrolment requirements and entry competences required for the course	Successfully passed all the exams of I.st year of study and participation in lectures and excercises in Physiology of domestic animals I and II		
2.3. Learning outcomes at the level of the programme to which the course contributes	After succesfull Pathophysiology I mastering, student will be able to define the terms health and disease, describe endocrinopathies, describe bioactive substances and their role in pathophysiolgy, describe disturbances in neural system function, master biological samples handling, determine serum protein, glucose and lipid concentrations and interpret the results.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After succesfull Pathophysiology I mastering, student will be able to -define the terms health and disease, -describe endocrinopathies, -describe bioactive substances and their role in pathophysiolgy, -describe disturbances in neural system function, -master biological samples handling, -determine serum protein, glucose and lipid concentrations and interpret the results		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures: Introduction in pathophysiology pathophysiology of inflammation and repair, 2 hours, disturbances in acido-base balance, 2 hours, pathophysiology of tumorigenesis and sepsis, 2 hours disturbances in adrenal gland function 2 hours disturbances in pituitary gland function, disturbances in pancreatic function 2 hours, Pathophysiology of central and peripheral neural system diseases 2 hours. Seminars: oxidative stress and antioxidative system, 2 hours disturbances in hidrosolubile and liposolubile vitamines and minerales metabolism 2 hours., Exercises: Absorption photometry 2 hours, Changes in protein concentration in serum, 2 hours, Diagnostic importance of acute phase proteins, 2 hours, disturbances in glucose metabolism 2 hours.		

2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,45	Research		Practical training	
	Experimental work		Report		Active participation in excercises	0.25
	Essay		Seminar essay		(other)	
	Tests	0.8	Oral exam		(other)	
	Written exam	1	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Elements of evaluation	Minimal points		Maximal points		
	Class attendance (12 hours of lectures)	3 (coefficient 0.5) $6 \times 0,5 = 3$ Student must attend 6 hours of lectures to get minimal 3 points		6 (coefficient: 0,5) $12 \times 0,5 = 6,00$		
	Seminars attendance (4 hours of seminars)	4 (coefficient: 0,27) $6/4=1.5$ Student must attend 2 hours of seminars to get minimal 4 points		6 coefficient:0,27) $4 \times 1,5 = 6$		
	Excercise attendance (9 hours of excercises)	4 $6/9=0.67$ Student must attend 6 hours of excercises to get minimal 4 points		6 (coefficient: 0,6) $10 \times 0,6 = 6$		
	Active participation in excercises Excercises done and signed by teacher Short knowledge examinations	5		10 $5 \times 2 = 10$ points		
	Continous knowledge checking Written test Biochemistry I	20		32		
	Written final exam	24		40		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	David O. Slauson, Barry J. Cooper (1982, 1999): Mechanisms of disease. Mosby, St. Louis, London, Philadelphia, Sydney, Toronto			1	Department library	
	Steven L. Stockham and Michael A. Scott (2008): Fundamentals of Veterinary Clinical Pathology. Blackwell Publishing			1	Department library	

	Mary Anna Thrall (2004): Veterinary Hematology and aClinical Chemistry, Lippincott Williams & Wilkins.	1	Department library
	J. Kaneko (1980, 2008): Clinical Biochemistry of Domestic Animals	1	Department library
2.12. Optional literature (at the time of submission of study programme proposal)	www. ivis. org		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Written exam		
2.14. Other (as the proposer wishes to add)			

PATHOPHYSIOLOGY II

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Mirna Robić	1.6. Year of the study programme	third
1.2. Name of the course	Pathophysiology II	1.7. Credits (ECTS)	6,5
1.3. Associate teachers	Prof. Nina Poljičak-Milas, Assoc. Prof. Romana Turk, Assoc. Prof. Maja Belić	1.8. Type of instruction (number of hours L + S + E)	39+6+50
1.4. Study programme (undergraduate, graduate, integrated)	Integrated graduate and postgraduate study	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	During the course students become familiar with development of pathological events, disturbances of normal function during the development of disease processes, and therefore achieve the basis for logical understanding of symptomatology in diseases and diagnostic procedures.		
2.2. Course enrolment requirements and entry competences required for the course	Participation in course Pathophysiology I (lectures, seminars, exercises).		
2.3. Learning outcomes at the level of the programme to which the course contributes	Students are enabled to describe digestive system pathophysiology, describe disturbances in hepatic and biliary function, define disturbances in carbohydrate, fat and protein metabolism, describe renal diseases pathophysiology, describe disturbances in blood and hematological system functions and heart diseases, describe disturbances in respiratory system functions, determine bilirubin concentration and liver enzymes activity and evaluate liver status, perform urinalysis and interpret results, evaluate red and white blood cells count in inflammatory and hematological diseases.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After succesful mastering, student will be able to: -describe and explain pathophysiology of digestive tract, liver and biliary system diseases -define metabolic disturbances - describe and explain kidney disease pathophysiology - describe and explain blood and hematological system disturbances and heart diseases - describe and explain respiratory system disorders - deterimne bilirubin concentration, and evaluate jaundice mechanism, determine liver enzymes function and evaluate liver status, determine lipid concentration and evaluate lipid metabolism - perform urinalysis and interpret results - perform hematological analysis and interpret results		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Disturbances in carbohydrate, fat and protein metabolism 4 hours, pathophysiology of liver and biliary system diseases 6 hours, pathophysiology of hemopoetic system 6 hours, pathophysiology of digestive system diseases 10 hours, pathophysiology of cardiac function and shock 6 hours, pathophysiology of respiratory system diseases 4 hours, pathophysiology of renal diseases 3 hours. Seminars (6 hours): Individual students presentation on specific topics in mechanisms of diseases Excercises: lipid and lipoprotein disorders (2 hours), urine analysis (2 hours), bilirubin metabolism disorders (2 hours) clinical enzymology (2 hours), anatomy and physiology of hematopoetic		

	system (2 hours), hematological analyses – blood cells counting (2 hours), determination of sedimentation rate and packed cell volume (2 hours), determination of hemoglobin concentration and calculation of erythrocyte constants (2 hours), determination of reticulocytes count, morphological changes of erythrocytes (2 hours), morphology of developmental stages of leukocytes (2 hours), determination of WBC and morphology changes of leukocytes (2 hours), differential cell count (2 hours), determination of eosinophils count and importance of changes (2 hours), differential WBC count (2 hours), interpretation of changes in total blood cell count in various species (2 hours), blood cells in birds (2 hours), blood cells in reptiles (2 hours), preparation of microphotographies and morphometry of blood cells (2 hours), changes in blood cells morphology in neoplastic diseases of hematopoietic system (2 hours), blood cells in laboratory rodents (2 hours), preparation and inspection of bone marrow slides (2 hours), interpretation of laboratory findings (2 hours), preparation for exam (2 hours).					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,715	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	1,3	Oral exam	1.56	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Student work in class will be evaluated according to lectures, seminars and exercise attendance and active participation in exercises. That way students can gain minimal 16 and maximal 28 points. Knowledge checking in written form can assure minimal 20 and maximal 32 points. To access the final exam students have to gain minimal points for attendance and knowledge checking. At the final exam, which will be in oral form, students will have to correctly answer the questions to gain minimal 24 or maximal 40 points. The final grade will be the sum of points gained by each criteria mentioned before. Grading scheme will be as follows: up to 59 points is grade F (insufficient), 60-68 points is grade E (sufficient), 69-76 points is grade D (sufficient), 77- 84 points is grade C (good), 85-92 points is grade B (very good) and 93-100 points is grade A (excellent).					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Robert H. Dunlop, Charles-Henri Malbert (2004): Veterinary pathophysiology, Blackwell Publishing, Ames, Iowa					
	Bernard, F. Feldman, J. G. Zinkl, N. C. Jain (2000): Schalm's veterinary Hematology. Lippincott Williams and Wilkins, Philadelphia, Baltimore, New York, London, Buenos, Aires, Hong Kong, Sydney, Tokyo.					

	David O. Slauson, Barry J. Cooper (2002): Mechanism of disease. Mosby, St. Louis, London, Philadelphia, Sydney, Toronto		
	Hansen, M. (1998): Pathophysiology. Foundations of disease and Clinical Intervention. Saunders company, Usa		
2.12. Optional literature (at the time of submission of study programme proposal)	www. ivis. org		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Evaluation elements	Minimal points	Maximal points
	Lectures attendance	3	6
	Seminars attendance	4	6
	Excercises attendance	4	6
	Active participation in excercises	5	10
	Knowledge checking	20	32
	Total points till final exam	36	60
	Final exam	24	40
2.14. Other (as the proposer wishes to add)			

PHARMACOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Frane Božić	1.6. Year of the study programme	3.
1.2. Name of the course	Pharmacology	1.7. Credits (ECTS)	6.5
1.3. Associate teachers	Jelena Šuran	1.8. Type of instruction (number of hours L + S + E + e-learning)	45L + 35E + 5S
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	-
1.5. Status of the course	Obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	Preparing students for veterinary clinics where they can choose appropriate therapy for any disease diagnosed in vet patients as well as correct writing formulary.		
2.2. Course enrolment requirements and entry competences required for the course	Passed exams from the first year of study and attended courses Physiology of domestic animals I. and II.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Students will particularly learn to approach specific species and categories of animals individually, but to treat farm animals as a group, as well. As regard that an animal should be get rid of pain in any moment it suffers, students will learn mechanisms of pain occurrence and its importance as well as the meaning of “multimodal pain therapy” concept.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	On the basis of knowledge gained upon the completed course and passed the exam “General and special pharmacology” students will be able to understand pharmacological basis of medical effects as well as species, age and other factors impacting on it. Besides, students will gain knowledge of effecting mechanisms of particular drug groups and will be able to chose the most appropriate drug (or drugs) indicated for specific disease or a pathological state. While doing so they will know to apply the drug in its optimal dose according to prescribed dose, while in the case of possible combination of a couple of drugs they will be aware of their mutual effects on each other (desirable or undesirable).		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 General pharmacology and pharmacology (concept and medication nomenclature, curative preparations, basis of pharmacotherapy, distribution and destiny of medication in organism, pharmacokinetics, pharmacodynamics, mechanisms of medication effects, factors influencing medication effects, medication biotransformation, observing of medication effects, medication residuum, NOEL, ADI, MRL, carentia, medication listing); 2 Peripheral nervous system pharmacology (Chemical neurotransmission, cholinergic and andrenergic), receptors through the influence of which neurotransmitters act and mechanism of neurotransmitters activities, medications efficient to cholinergic and adrenergic neurotransmission); 3 Central nervous system pharmacology (Sedatives, general anaesthetics (injective and inhalation) , dissociative anaesthetics, local anaesthetics, myorelaxines, opioid analgesics, anticolinergics, analeptics); 4 Pharmacology of heart and vascular system (Heart stimulators, antiarrhythmics, antihypersensitives, vasodilators); 5 Pharmacology of urinary organs and reproduction (Diuretics, antidiuretics, acidotics and acalotics, uroantiseptics, reproduction pharmacology); 6 Pharmacology of respiratory organs (Expectoranses, mucolitics, antitusics,		

	bronchodilators, breathing stimulators); 7 Pharmacology of digestive system (Emetics, antiemetics, antacids, prokinetics, laxans, antidiarrhoeals, antispasmodics); 8 Anti-inflammatory and immunomodulatory drugs (Nonsteroidal anti-inflammatory drugs (effects and side effects), steroid anti-inflammatory drugs (effects and side effects), immunosuppressives, immunostimulators); 9 Antimicrobial medications (Antimicrobial spectrum, pharmacodynamics, pharmacokinetics, application, resistance, side effects); 10 Beta lactams (Benzylpenicillin (Na, K, procaine, benzathine), ampicillin and amoxicillin, inhibitors beta lactamase – clavulanic acid, isoxazolyl penicillins, cephalosporins – I, II, III and IV generation); 11 Aminoglycosides, aminocyclitols, polypeptides (Streptomycin, gentamicin, neomycin, amikacin, spectinomycin, polymyxin B and E, zincbacitracin); 12 Macrolides, lincosamides, tetracyclines (Erythromycin, tylosin, azithromycin, lincosamide, tetracycline, oxytetracycline, doxycycline); 13 Phenicol, quinolones, sulphonamides (Chloramphenicol, fluorphenicol, thiamphenicol, flumequin, enrofloxacin, norfloxacin; Sulfonamides – enteric and systematic); 14 Antimycotics (Griseofulvin, nystatin, imidazoles, amfotericin B, terbinafine, iodine preparations and other); 15, Antiparasitics (Anticoccidial medications – ionophore antibiotics and other coccidiocides, antihelminthics, antiparasitic drugs – diminazene aceturate, imidazole): 16 Endoparasiticides – nematocides (Piperazine, organophosphates, tetrahydropyrimidines, imidazoles, benzimidazoles, avermectins and milbemectins); 17 Trematocides (BZM – albendazole and triclabendazole, substituted phenols, salicylanilides); 18 Cestodes (Arecolin, niclosamide, bitionol, BZM, praziquantel); 19 Ectoparasiticides (Pyrethroids, pyrethroids, OFS, carbamates, avermectins – milbemectins, amitraz, fipronil, insect growth and development inhibitors);					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	attending lectures attending exercises attending seminars participation at exercises and seminars continuous knowledge checking and final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,17	Research		Practical training	
	Experimental work	0	Report		(other)	
	Essay	0	Seminar essay	0,65	(other)	
	Tests	2,08	Oral exam	2,6	(other)	
	Written exam	0	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Participation of students at exercises will be evaluated with short oral tests. Continuous knowledge checking will be done with preliminary written exams which will be organised during the semester at one exercise term. The preliminary exams will be divided in two parts. Students are obliged to pass short oral tests and written exams in order to take the final exam. Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of the makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of the total sum from all five evaluation elements: attending lectures, seminars, exercises, participation at seminars and exercises, continuous knowledge checking and final exam.					

	Activity	Minimum number of points	Maximum number of points	
	Attending lectures	3	6	
	Attending seminars	4	6	
	Attending exercises	4	6	
	Active participation at exercises and seminars	5	10	
	Continuous knowledge checking	20	32	
	Final exam	24	40	
	Total	60	100	
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Lecture handouts and notes		-	Yes, LMS
	Riviere, J., M. Papich (2018): Veterinary Pharmacology and Therapeutics, 8 th ed. Wiley Blackwell.		1	
	Maddison, Page and Church (2008): Small Animal Clinical Pharmacology. 2 nd ed. Saunders Elsevier. Papich, M.G. (2011): Saunders Handbook of Veterinary Drugs. 3 rd Ed. Elsevier Saunders. Booth D. M. (2012): Small animal Clinical Pharmacology, Elsevier (Saunders) 2 nd ed., St. Louis, Missouri 63043.			
2.12. Optional literature (at the time of submission of study programme proposal)	For each student of the Department there will be a Form for keeping records of his/her attendance of the lectures, exercises and seminars, with columns for evaluating his/her participation at seminars and exercises. In the part of continuous knowledge checking there will be the date of taking the preliminary exams, examiner's name and number of gained points.			
2.13. Quality assurance methods that ensure the acquisition of exit competences				
2.14. Other (as the proposer wishes to add)				

RADIATION HYGIENE

1. GENERAL INFORMATION			
1.1. Course teacher	Marinko Vilić, DVM, PhD, Associate Professor	1.6. Year of the study programme	3
1.2. Name of the course	Radiation hygiene	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Miljenko Šimpraga, DVM, PhD, Full Professor Ivona Žura Žaja, DVM, PhD, Assistant Professor Ana Shek Vugrovečki, DVM, PhD, Assistant Professor Jadranka Pejaković Hlede, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	L10+S0+E20
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	At the Radiation hygiene course students will learn how to be able to (1) protect their selves and their associates from radioactive contamination and irradiation; (2) use detectors of ionising radiation and dosimeters, detect ionising radiation, determine its type and calculate the radiation dose (3) to use high frequency spectrum analyzer and radiofrequency meters and to calculate the exposure limits (4) protect the housings, animal habitats, domestic animals, animal feed and foodstuff from radioactive contamination and radiation (5) perform decontamination of domestic animals, animal feed, meat, milk, water and other food of animal origin, animal habitats, various subjects and environment (soil, farmlands) and check-up the success of decontamination; (6) evaluate radiation hygiene properties of meat, milk and other food and their use as human food, and all intended to protect humans from radiation and radiation risks; (7) evaluate the risk of malignant diseases appearance in humans due to feeding with contaminated milk and meat; (8) conserve food by ionizing radiation. Besides, the students will obtain the basic knowledge about ionizing and non-ionizing (microwave) radiation effects on animals and humans. Both is necessary for course in radiology, nuclear veterinary medicine and for performing other activities in veterinary profession referring to electromagnetic radiation. Finally, without mastering this course, veterinarians are not legally allowed to perform X-ray examinations or examinations by application with radioactive isotopes (nuclear veterinary medicine). Neither is it allowed to perform veterinary inspection or other things relating to animal hygiene.		
2.2. Course enrolment requirements and entry competences required for the course	Physic and biophysics final exam, Physiology of domestic animals 1 final exam		
2.3. Learning outcomes at the level of the programme to which the course contributes			

<p>2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</p>	<p>After successfully mastering the course students will be able to: recognize the sources of ionizing radiation describe the pathway of radioactive contamination and the biological effects of ionizing radiation protect the housings, animal habitats, domestic animals, animal feed and foodstuff from radioactive contamination and radiation perform decontamination of domestic animals, animal feed, meat, milk, water and other food of animal origin, animal habitats, various subjects and environment (soil, farmlands) and check-up the success of decontamination evaluate radiation hygiene properties of meat, milk and other food use the dosimeters and detectors of ionizing radiation and calculate the radiation dose recognize food conserving by ionizing radiation recognize the sources of non-ionizing (microwave) radiation and describe the biological effects</p>	
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>Introduction to radiation hygiene Standards of radiation protection Radioactive contaminations Biologically significant radionuclides (Iodine-131, Strontium-90, Caesium-137 and Caesium-134) Effects of ionizing radiation upon animals and humans Protection of humans and domestic animals from radiation. Protection of humans, animals, animal feed and foodstuff from contamination Methods of radioactive decontamination Radioactive decontamination of animals, animal feed, food (milk and meat), various material and environment Radiation-hygiene controls of food, water and animal feed and evaluation of their propriety Conservation of food by ionizing radiation Dosimetry (Dosimeters, the role of personal dosimetry. Dosimetric sizes and units Work with detectors of radioactivity Gamma ray spectrometry Procedure with animals, animal feed and foodstuff of animal origin in possible accidental contamination of the area Calculation of maximum permissible concentration of radio nuclides in animal feed in regard to permissible concentrations of those radionuclides in milk and meat 17. Calculation of risk from malignant diseases in humans after exposure to ionizing radiation or due to intake of contaminated milk and meat Calculation of exposition rate, safe distance from sources of radiation as well as absorber thickness in the vicinity of radioactive source. Calculation of maximum time spending inside contamination area Sources of non-ionizing (microwave) radiation Biological effects of non-ionizing (microwave) radiation Instrumentation for measuring microwave power</p>	
<p>2.6. Format of instruction:</p>	<p><input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work</p>	<p><input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)</p> <p>2.7. Comments:</p>
<p>2.8. Student responsibilities</p>	<p>The students total obligations at the course, start and finish times of the lessons, time-table and location of lessons will be announced on the Department of Physiology and Radiobiology and Faculty of Veterinary medicine notice board and on their web page.</p>	

2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.45	Research		Practical training	
	Experimental work		Report		Activity	0.25
	Essay		Seminar essay		(other)	
	Tests	0.8	Oral exam		(other)	
	Written exam	1	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	In order to take the final exam a student must gain minimal 16 points from attending at lectures and exercises, participation at exercises and minimal 20 points from continuous knowledge checking.					
	Types of activities	Minimal number of points		Maximal number of points		
	Attending lectures (10 lecture hours)	3 (coefficient 0.6); 3:0.6=5 (5 lecture hours)		6 6:10=0.6 (coefficient 0.6)		
	Attending exercises (20 lecture hours)	8 (coefficient 0.6) 8:0.6=13,3 (14 lecture hours)		12 12:20=0.6 (coefficient 0.6)		
	Participation at exercises 10 points = 5 tests 1 test = max. 2 points 1 test = 4 question x 0.5 (2 points x 5 tests = 10 points)	5 (coefficient 0.5); 5:0.5=2.5 (student must write 3 tests and answer minimum 10 questions)		10 10:20 question =0.5 (coefficient 0.5)		
	Continuous knowledge checking 1 test = 32 questions 1 question = 1 point	20 (coefficient 1); 20:1=20 (student must gain minimal 20 points)		32 32:32=1 (coefficient 1)		
	Final exam In written form 33 questiones 7 questiones = 14 points 26 questiones = 26 points	24 (coefifcient 1 or 2) 7x2=14 26x1=26 (student must gain minimal 24 points)		40 14+26=40 14:7=2 (coefficient 2) 26:26=1 (coefficient 1)		
	Total	60		100		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availabilit y via other media	
	Vilić, M. (2014): RADIATION HYGIENE, Selected chapters of radioecology, radiobiology and radiation hygiene. Faculty of Veterinary Medicine, Zagreb.				available online	
	IAEA (2010): Radiation biology: a handbook for teachers and students				available online	
	Howard, B. J., N. A. Beresford, G. Voigt (2001): Countermeasures for animal products: a rewiw of effectiveness and potential usefulness after an accident. J. Environ Radioactivity 56, 115-137.				available online	
2.12. Optional literature (at the time of submission of	Statkiewicz-Sherer, M. A.. P. J. Visconti, E. R. Ritenour (2002): Radiation protection. 4th ed. Mosby, Inc. St. Louis.			2		
	Hall, J. E. (2000): Radiobiology for the radiologist. 5 th ed. Lippincott Williams & Wilkins. Philadelphia-Baltimore-New York-LondonBuenos Aires-Hong Kong-Sydney-Tokyo.					

study programme proposal)	
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous knowledge checking Final exam
2.14. Other (as the proposer wishes to add)	

SPECIAL MICROBIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Nevenka Rudan, PhD	1.6. Year of the study programme	Third (3.) year of the study programme
1.2. Name of the course	Special Microbiology	1.7. Credits (ECTS)	4.5 ECTS
1.3. Associate teachers	Prof. Ljiljana Pinter, PhD; Luka Radmanić, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15+15+30
1.4. Study programme (undergraduate, graduate, integrated)	Integrated study	1.9. Expected enrolment in the course	
1.5. Status of the course	Regular course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will get knowledge of the most important causative agents of animal infectious diseases as well as on basic microbiological techniques for their isolation and identification which could be used in practice. They will get special skills in taking and sending of clinical materials to a microbiological laboratory. They will get acquainted with methods of culturing microorganisms, with preparing specimens for optical microscope and with staining procedures for bacteria, and also how to prepare fresh, living preparations (uncoloured) for dermatophytosis diagnostics. They will master the methods of culturing of microorganisms on bacteriological media and get acquainted with properties of the most important species of bacteria, fungi and viruses. They will get acquainted with their morphologic, growing, physiologic and antigenic features important for making aetiological diagnosis of infectious diseases. They will get knowledge of microbiological drugs and possibilities of immunoprophylaxis.		
2.2. Course enrolment requirements and entry competences required for the course	Audited teaching from „Veterinary immunology“ and „General microbiology“		
2.3. Learning outcomes at the level of the programme to which the course contributes	Students will get knowledges necessary for clinical courses, especially for „Infectious diseases of domestic animals“		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Understanding the basic principles and techniques for isolation and identification of pathogenic microorganisms, and what diagnostic tests should be performed for their identification; Interpreting the meaning of the results of microbiological examination in the process of etiological diagnosis of infectious diseases; Information of classification the bacteria, viruses and fungi with genera and species important for veterinary medicine; Knowledge about specifics of microorganism grows, virulence properties of microorganism and disease it causes; Understanding what specimens should be collected and get acquainted with preventive and therapeutic strategies.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures: 1., 2. lesson <i>Taksonomy of bacteria, History of microbiology, Spiral bacteria 1. part</i> ; 3., 4. lesson <i>Spiral bakteria 2. part</i> ; 5., 6. lesson <i>Bacillus spp. and Clostridium spp.</i> ; 7., 8. lesson <i>Streptococcus spp. and Staphylococcus spp.</i> ; 9., 10. lesson <i>Mycoplasmas, Klebsiella spp. and Yersinia spp.</i> ; 11., 12. lesson <i>Poxviridae and Parvoviridae</i> ; 13., 14. lesson <i>Orthomyxoviridae and Paramyxoviridae</i> ; 15., 16. lesson <i>Papillomaviridae and Circoviridae</i> ; Seminars:		

	1., 2. lesson <i>Spiral bacteria, Bacteroides, Fusobacterium, Francisella tularensis</i> ; 3., 4. lesson <i>Chlamydias and rickettias, Salmonella spp. and Escherichia coli</i> ; 5., 6. lesson <i>Mycobacterium spp., Listeria monocitogenes, Erysipelothrix rhusiopathiae, Actinobacillus spp.</i> ; 7., 8. lesson <i>Herpesviridae and Picornaviridae</i> ; 9., 10. lesson <i>Flaviviridae and Rhabdoviridae</i> ; 11., 12. lesson <i>Reoviridae and Arteriviridae</i> ; 13., 14. lesson <i>Retroviridae, Coronaviridae and Adenoviridae</i> ; Exercices: 1., 2. lesson <i>Spiral bacteria</i> ; 3., 4. lesson <i>Pseudomonas aeruginosa, Burkholderia pseudomallei, Burkholderia mallei</i> ; 5., 6. lesson <i>Mycobacterium spp.</i> ; 7., 8. lesson <i>Pasteurella multocida, Manheimia haemolytica, Haemophilus-Histophilus</i> ; 9., 10. lesson <i>Escherichia coli, Klebsiella pneumoniae subs. pneumoniae</i> ; 11., 12. lesson <i>Salmonella, Yersinia enterocolitica, Yersinia pseudotuberculosis</i> ; 13., 14. lesson <i>Staphylococcus spp.</i> ; 15., 16. lesson <i>Bacillus spp., Clostridium spp.</i> ; 17., 18. lesson <i>Listeria monocytogenes</i> ; 19., 20. lesson <i>Erysipelothrix rhusiopathiae, Corinebacterium-Arcanobacterium</i> ; 21., 22. lesson <i>Streptococcus spp.</i> ; 23., 24. lesson <i>CPE of herpesviruses and arteriviruses in horses</i> ; 25., 26. lesson <i>Fungi</i> ; 27., 28. lesson <i>Dermatophytes, Moulds</i> ; 29., 30. lesson <i>Calculation of viral titer</i>					
2.6. Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.81	Research		Practical training	
	Experimental work		Report		Activity at seminars and exercises	0.45
	Essay		Seminar essay		(other)	
	Tests	1.44	Oral exam		(other)	
	Written exam	1.8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Two preliminary exams will be organized during the course. Each preliminary exam contains 16 questions, and 1 question is worth with 1 point. A student must gain minimal 20 points from both exams and 32 points maximal. A student who gains 20 points from continuous checking can take the final exam. For final exam a student additionally must gain minimal 16 points from attending lectures, seminars, exercises and from participation at seminars and exercises. The final exam is written exam and student must gain minimal 24 points and maximal 40 points.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Carter, G. R., Darla J. Wise (2004): Essentials of Veterinary Bacteriology and Mycology. Blackwell Publishing, 6. edition					
	Quinn, P. J., M. E. Carter, B. K. Markey, G. R. Carter (1994): Clinical Veterinary Microbiology. M. Wolfe. London					
	MacLachlan, N. J., E. J. Dubovi (2011): Fenner's Veterinary Virology. Elsevier, A.P. Amsterdam, Boston, Heidelberg, London, New York, Oxford, Paris, San Diego, San Francisco, Singapore, Sydney, Tokyo. Fourth Edition					
	King, A. M. Q., M. J. Adams, E. B. Carstens, E. J. Lefkowitz (2012): Virus Taxonomy. Classification and Nomenclature of Viruses. Amsterdam, Boston,					

	Heidelberg, London, New York, Oxford, Paris, San Diego, San Francisco, Singapore, Sydney, Tokyo. Ninth Edition		
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Naglić, T., D. Hajsig, J. Madić, Lj. Pinter (2005): Veterinary microbiology – Special bacteriology and mycology. Veterinary faculty, Zagreb</p> <p>Kalenić, S., E. Mlinarić-Missoni (2005): Medical bacteriology and mycology. Merkur A.B.D. Zagreb</p> <p>Presečki, V. i sur. (2002): Virology. Medical edition, Zagreb</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences	<p>With continued testing of students by oral exams and tests.</p> <p>By utilization the results of anonymous student's polls in which they put forward a critiques and proposals for teaching improvement.</p>		
2.14. Other (as the proposer wishes to add)			

SPECIAL VETERINARY PATHOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Andrea Gudan Kurilj, DVM, PhD, DECPV	1.6. Year of the study programme	3 rd
1.2. Name of the course	Special veterinary pathology	1.7. Credits (ECTS)	10,5
1.3. Associate teachers	Associate professor Marko Hohšteter, DVM, PhD; Assistant professor Ivan-Conrado Šoštarić-Zuckermann, DVM, PhD; Doroteja Huber, DVM, PhD; Lidija Medven Zagradišnik, DVM; Ivana Mihoković Buhin, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	60+0+75+0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	active	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	Pathogenesis of noninfectious, infectious and congenital diseases. Classification and nomenclature of diseases. Morphology of lesions characteristic for certain diseases. Macroscopic and microscopic recognition of diseases related to the clinical signs of the disease.		
2.2. Course enrolment requirements and entry competences required for the course	Previous completion of General veterinary pathology course.		
2.3. Learning outcomes at the level of the programme to which the course contributes	At the end of the course students will get knowledge in pathology of organic systems necessary for further performing of education in other clinical subjects. The final goal upon the end of the studying is to be able to recognise a pathological process, make a right diagnosis and give the proper therapy, or if the animal perishes to get the right diagnosis in a proper way (by autopsy and other laboratory studies) thus act as a preventive measure for other animals.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>By the completion of the course students should be able to:</p> <ul style="list-style-type: none"> - analyze pathological changes (lesions) and classify them in order to determine specific animal diseases - analyze microscopic slides of basic pathologic processes and most important animal diseases - correlate macroscopic and microscopic changes together with the results of other ancillary laboratory tests - make diagnosis and conclusion about emergence and development of disease or animal death 		

	- write necropsy report		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures:		
	Methodological unit	Contents	No. of hours
	Special pathology of digestive system	Oral cavity, salivary glands, esophagus	2h
	"	Forestomachs and stomach	2h
	"	Intestines	2h
	"	Liver	2h
	"	Egzocrine part of pancreas, peritoneum	1h
	Special pathology of respiratory system	General informations, nasal cavity and synuses, larynx, trachea	2h
	"	Lungs	5h
	Special pathology of urinary system	Kidneys	3h
	"	Lower urinary tract	3h
	Special pathology of cardiovascular system	Heart	2h
	"	Blood vessels	1h
	Special pathology of hematopoietic system	Bone marrow	1h
	"	Blood cells	1h
	"	Lymphatic system	2h
	Special pathology of nervous system	Central nervous system	6h
	"	Peripheral nervous system	2h
	Special pathology of musculoskeletal system	Skeletal muscles	2h
	"	Bones and joints	2h
	Special pathology of endocrine system	Introduction	2h
	"	Diseases of endocrine glands	2h
	Special pathology of the eye	Eye, eyelids, conjunctivae, eye socket	2h
	Special pathology of genital system	Female genital system	3h
	"	Male genital system	3h
	Special pathology of the skin	Introduction	2h
	"	Degenerative changes	3h
	"	Inflammatory changes	2h
	Practicals:		
	Necropsy: necropsy technique and recognition of pathologic changes – 30h		
	Histopathology (30h):		
	Exercise 1.	introduction: sample preparation, dyeing techniques fatty liver liver, cholestasis skeletal muscle, myofibrillar degeneration and coagulative necrosis	2h

	Exercise 2.	Chronic, eosinophilic and fibrous interstitial hepatitis (parasitic hepatitis) Multifocal miliary necrotizing and neutrophilic hepatitis (Sallmonelosis) Postnecrotic liver cirrhosis hepatitis, necrotizing, multifocal to confluent, acute (mainly centrolobular)	2h
	Exercise 3.	Pulmonary artery branch thrombosis Chronic vegetative valvular endocarditis Septic thrombotic endocarditis. Hemorrhagic infarction of the spleen (hog cholera)	2h
	Exercise 4.	Embolic myocarditis Viral myocarditis (FMD) hepatitis, granulomatous, multifocal (miliary), chronic (tuberculosis) Cutaneous actinomycosis	2h
	Exercise 5.	Skin; Sebaceous gland, nodular hyperplasia Skin; Squamous cell carcinoma Skin; Papilloma Testis; Seminoma	2h
	Exercise 6.	Lymph node; Lymphoma Skin; Mast cell tumor (HE & Toluidin) Mammary gland; Adenocarcinoma Mammary gland; Benign mixed tumor	2h
	Exercise 7.	Fibrinous, partially necrotic pneumonia. Embolic purulent bronchopneumonia Enzootic pneumonia of pigs	2h
	Exercise 8.	Stomach; Gastric ulcer Intestine; Parvovirosis Kidney: FIP	2h
	Exercise 9.	Canine distemper (Lung, Urinary bladder) Rabies	2h
	Exercise 10.	Mammary gland; Mastitis Uterus; pyometra. Glomerulo-interstitial chronic nephritis	2h
	Exercise 11.	Liver; Infectious canine hepatitis. Acute hemorrhagic lymphadenitis (hog cholera) Purulent lymphadenitis	2h
	Exercise 12.	-Chronic verminous pneumonia (aelurostrongylosis) -Liver; Coccidiosis -Liver; Toxoplasmosis -Myocard; Sarcocystosis.	2h
	Exercise 13.	-Uremia (Kidney, tongue)	2h
	Exercise 14.	-Repetition	2h
	Exercise 15.	-Test	2h
	Konverzatorij: 15h		
2.6. Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	X independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:

2.8. Student responsibilities	Active participation during course.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1,89	Research		Practical training	
	Experimental work		Report		Activity	1,05
	Essay		Seminar essay		(other)	
	Tests	3,36	Oral exam	4,2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	MINIMAL NUMBER OF POINTS			MAXIMAL NUBMER OF POINTS	
	Attending lectures	3			6	
	(The total of 60 lecture hours)	(each particular lecture hour is summed as 0,1 point)				
		A student must attend minimal 30 lecture hours in order to gain 3 minimal points;				
	Attending exercises	8			12	
	(Total of 75 exercise hours; Autopsy 30 hours, Histopathology 30 hours, Exercises-Konverzatorij 15 hours)					
		(A student must attend minimal 53 hours of exercise in order to gain 8 minimal points)				
	Participation at exercises	5 (Autopsy 2 points, Histopathology 2 points, Exercises – Konverzatorij 1 point)			10 (Autopsy 4 points, Histopathology 4 points, Exercises – Conversatorium 2 points)	
	Necropsy: 0 points= autopsy was not carried out and report wasn't turned in, 1 point=, autopsy for report carried out, report not turned in 2 points= autopsy for report carried out, report turned in, 3 points= autopsy for report carried out, report turned in + additional autopsy carried out; 4 points= autopsy for report carried out, report turned in + additional					

	<p>autopsy carried out, with demonstration of good knowledge;</p> <p>Histopathology: 0 points= most of the given histological preparations not drawn, 1 point= most of the given preparations are drawn, 2 points=all given preparations are drawn and most of the proper preparation descriptions are attached, 3 points= all given preparations are drawn and all of the proper preparation descriptions are attached, 4 points= all given preparations are neatly drawn and all of the proper preparation descriptions are attached ; Exercises-Konverzatorij : 0 points= given programme unit is not acquired, 1 point= the acquired programme unit, 2 points= acquired given programme unit +active participation at the analysis of the programme unit)</p>	
	(a student must gain 5 points - two from Autopsy, two from Histopathology and one from Exercises-Conversatorium, in order to earn minimal 5 points)	
	Continuous knowledge checking	<p>20 (written preliminary exam from Pathology of skin 10 points; practical partial exam from Histopathology 10 points)</p>
	<p>Written preliminary exam from Pathology of skin is made out of 32 questions. To pass this test student must reach a minimal score of 10 points, maximum being 16 points. To obtain minimal score student should correctly answer 20 questions, since every correct answer is awarded with 0.5 points (20x0.5=10 minimal points). It is important to notice that incorrect answers on this test are awarded with negative points (every incorrect answer nullifies one correct answer). The total number of points scored at this test is gained by subtracting number of incorrect answers from correct ones. Unanswered questions will be omitted.</p> <p>Practical partial exam from histopathology is carried out by examining students knowledge of the histopathology slides. To pass this part student must reach a</p>	

	minimal score of 10 points, maximum being 16 points.	
Final exam	24	40
(Oral exam)	(0-23 points=insufficient knowledge, 24-27 points=sufficient knowledge, 28-31 points=good knowledge, 32-36 points=very good knowledge, 37-40 points=excellent knowledge)	
	(a student must show sufficient knowledge in order to gain minimal 24 points)	
TOTAL	60	100

Final exam:

Minimal conditions for passing the first, second, third and fourth evaluation elements are all summed up and they are worth 36 points all together. In order to take the final exam a student must gain the 36 points. The final exam consists of a written and oral part. Written part of the final exam will last for 90 minutes, and consists of two parts. The first part is recognition of macroscopic pathological changes (duration: 20 minutes). In this part, 10 photographs of pathological processes (one photo at 2 minute intervals) will be displayed on the LCD projector. For each photo, two questions will be asked, and the student can get maximum of 1 point per photograph (points are awarded in range from 0.25 to 1). The second part of the written exam is in the essay form. Each question will have guidelines to clarify what is expected in answers. Students will briefly describe some pathological processes. This part of the exam contains of 9 questions, six of which give up to four (4) points (24 points in total), and three (3) questions bring up to two (2) points (6 points total). Two questions from those who bring 4 points are qualifying questions that must be answered with a minimum of 3 points. The maximum maximum number of points on the written exam is 40. After scoring a written part of the final exam, students who got the minimum number of points (24) will be allowed to access the oral exam, while those with fewer points receive a negative grade and will not be able to access the oral part of the final exam. Questions at the oral part of the exam will be on the same principle as essay type question in the written part. The grade on the final exam is the one derived from the points that student has collected corresponding to questions from the written and oral part of the exam. The maximum amount of points in final exam is 40.

Final evaluation:

Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all six evaluation elements, according the following table

<i>Points</i>	<i>Grade</i>
up to 59	1 (F)
60-68	2 (E)
69-76	2 (D)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	M. D. McGavin, Zachary, J. F.: Pathologic Basis of Disease, 6 th edition, Elsevier, Philadelphia, 2017.	5	
	Jubb, Kennedy, and Palmer's pathology of Domestic Animals. 5 th ed. Vol. 3. Edited by Grant Maxie M. Philadelphia: Elsevier Saunders; 2007		
2.12. Optional literature (at the time of submission of study programme proposal)	1. Grabarević, Željko i Sabočanec, Ruža (ur.): Osnove razudbe domaćih životinja. Medicinska naklada, Zagreb, 2016. 2. Notes and presentations provided by lecturers.		
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

LIST OF OBLIGATORY SUBJECTS – 4th STUDY YEAR

Obligatory Subjects – 4th study year

Biology and Pathology of Beneficial Insects
Biology and Pathology of Aquatic Organisms
Game Breeding and Management
General and Clinical Radiology
Internal Medicine
Methods of Physical Therapy and Diagnostics
Obstetrics and Reproduction I
Surgery, Orthopaedics and Ophthalmology I
Surgery, Orthopaedics and Ophthalmology II
Toxicology

BIOLOGY AND PATHOLOGY OF BENEFICIAL INSECTS

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Ivana Tlak Gajger	1.6. Year of the study programme	4 th
1.2. Name of the course	Biology and Pathology of Beneficial Insects	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Associate Professor Emil Gjurčević Assistant Professor Krešimir Matanović	1.8. Type of instruction (number of hours L + S + E + e-learning)	11+0+25+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	-
1.5. Status of the course	Obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 1
2. COUSE DESCRIPTION			
2.1. Course objectives	During lectures and exercises student must obtain general knowledge about honeybee breeding in order to comprehend the importance and role of veterinarians in recognizing and controlling diseases. The skills which one must accomplish are proper examination of honeybee colonies, recognition of clinical signs, sampling and sending the materials for laboratory procedures, and also apply prevention and therapy of honeybee diseases.		
2.2. Course enrolment requirements and entry competences required for the course	Completed exams of next courses: General Veterinary Pathology, Pharmacology and Special Microbiology.		
2.3. Learning outcomes at the level of the programme to which the course contributes	The course is linked to the basic veterinary courses in previous years of study, and represents synthesis of previous veterinary disciplines applicable to the biology and pathology of beneficial insects. The course prepares students for laboratory and field work in biology and pathology of beneficial insects array.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Annotate the role of honeybee in natural ecosystems - Explain manner of life and activities of honeybee colony, construction of combs and development of brood - Recognize different types of hives, feeders and water suppliers, and beekeeping equipment - Describe individual organs of health honeybee and alterations caused by diseases - Distinguish diseases of brood and adult bees based on characteristic signs - Apply basic clinical and diagnostic techniques with aim to appoint suspicion on honeybee diseases - Define role of veterinarian in procedure of sampling and sending materials for laboratory examinations, treatments and sanitation of diseases 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures (11): <ul style="list-style-type: none"> - Introduction (Honeybees in nature, pollination, veterinarian and bees); Species and races of honeybees (origin, Asian and European) - Honeybee colony (members and division of work); Honeybee colony during season (building up of colony, migratory beekeeping, overwintering); Reproduction (development of brood, queen rearing); Apian products - Introduction in honeybee pathology (particularities of epizootiology) 		

	<ul style="list-style-type: none"> - Viral diseases - Diseases caused by bacteria - Diseases caused by fungi - Diseases caused by parasites - Non-infectious diseases - Pest and enemies - Intoxications <p>Exercises (25):</p> <ul style="list-style-type: none"> - Hives and beekeeping equipment - Anatomy of honeybee - Diagnostic proceedings of disease and sanitation - Work on apiary - Breeding and diseases of bumblebee colony - Breeding and diseases of solitary bees (<i>Osmia</i> spp.) 					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments: Laboratory work includes teaching sessions where students themselves prepare and use microscope preparations of pathological materials.	
2.8. Student responsibilities	Active attending and participation at lectures (53%), exercises and field work (69%). Accessing to continuous knowledge checking and final exam.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.45	Research		Practical training	
	Experimental work		Report		Activity on exercises	0.25
	Essay		Seminar essay		(other)	
	Tests	0.8	Oral exam	1	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures 3 – 6 points (1 lecture hour equals 0.54 point) Attending exercises 8 - 12 points (1 programme (two hours) equals 0.48 points) Participation at exercises 5 – 10 points (participation at exercises will be evaluated with short oral tests with 5 points at least) Continuous knowledge checking 20 - 32 points (preliminary exam (20 questions), (1 question equals 1.6 points)) Final exam - oral: 24-40 points, (5 questions: 1 question equals 8 points).					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Vidal-Naquet, N. (2015): Honeybee Veterinary Medicine: <i>Apis mellifera</i> L. 5m Publishing Benchmark House, Sheffield, UK.			1		
	Snodgrass, R. E., E. H. Erikson (2005): The anatomy of the honey bee. The hive and the honey bee (ed. J. M. Graham). Dadant and Sons, Hamilton, USA.			1		
	Southwick, E. E. (2005): Physiology and social physiology of the honey bee. The hive and the honey bee (ed. J. M. Graham). Dadant and Sons, Hamilton, USA.			1		
	Gary, N. E. (2005): Activities and behaviour of honey bees. The hive and the honey bee (ed. J. M. Graham). Dadant and Sons, Hamilton, USA.			1		

	Bailey, L., B. Ball (1991): Honey bee pathology. Academic Press, London.	1	
	PP presentations of lectures and exercises		LMS
2.12. Optional literature (at the time of submission of study programme proposal)	Jürgen Tautz (2008): The buzz about bees – biology of a superorganism. Springer, Germany. Caron, D. M., L.J. Connor (2013): Honey bee biology and beekeeping. Wicwas Press, Pennsylvania, USA.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Final exam - oral. At the Department there will be a Form for each student for keeping records of his/her lecture and exercises attendance and with a columns for evaluating his /her participation at exercises and for continuous knowledge checking.		
2.14. Other (as the proposer wishes to add)	Anonymous student questionar about teaching work.		

BIOLOGY AND PATHOLOGY OF AQUATIC ORGANISMS

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Emil Gjurčević	1.6. Year of the study programme	4 th
1.2. Name of the course	Biology and Pathology of Aquatic Organisms	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Associate Professor Ivana Tlak Gajger Assistant Professor Krešimir Matanović	1.8. Type of instruction (number of hours L + S + E + e-learning)	11+0+25+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	-
1.5. Status of the course	Obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 1
2. COUSE DESCRIPTION			
2.1. Course objectives	During lectures and exercises students obtain general knowledge about breeding of aquatic organisms in order to comprehend the importance and role of veterinarians in recognising and controlling aquatic organism diseases. The skills which one must accomplish are proper examination of aquatic organisms, recognition of clinical signs, sampling and sending the materials for laboratory procedures, and also prevention and therapy in aquaculture.		
2.2. Course enrolment requirements and entry competences required for the course	Completed exams in next courses: General Veterinary Pathology, Pharmacology and Special Microbiology		
2.3. Learning outcomes at the level of the programme to which the course contributes	The course is linked to the basic veterinary courses in previous years of study and represents synthesis of previous veterinary disciplines applicable to the biology and pathology of fish and other aquatic organisms. The course prepares students for laboratory and field work in the field of biology and pathology of fish and other aquatic organisms.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Recognize fish species and other aquatic organisms important for breeding Obtain general knowledge about breeding of aquatic organisms Comprehend the importance and role of veterinarians in maintenance of fish health and human health Perform routine diagnostic examination, recognize clinical signs of disease Professional sampling and transport of samples for laboratory examinations Apply therapeutic measures and measures for prevention of disease		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures (11) Introduction (Importance of breeding of aquatic organisms); The aquatic environment (Basic water quality parameters for aquatic organisms); Natural and artificial spawning; Breeding of aquatic organisms; Viral fish diseases (Diseases prevented by Regulations of veterinary medicine and others important for breeding); Bacterial fish diseases (Diseases important for breeding); Parasitic fish diseases (Diseases important for breeding); Fungal fish diseases and diseases caused by abiotic factors; Diseases of crabs and molluscs (Diseases prevented by Regulations of veterinary medicine and others important for breeding);		

	Zoonoses.					
	Exercises (25) Systematic of aquatic organisms (Systematic of freshwater and marine fish and other aquatic organisms important for breeding); Anatomy of aquatic organisms (Fish and molluscs anatomy); Clinical examination (External examination and biopsy); Sending of the materials for laboratory examinations; Ichthyosanitary measures; Virological, bacteriological and parasitological procedures (Specified for aquatic organisms).					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> independent assignments		2.7. Comments: Laboratory work includes teaching sessions where students themselves use microscope for pathological examination.		
	<input type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet				
	<input checked="" type="checkbox"/> exercises	<input checked="" type="checkbox"/> laboratory work with mentor				
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> (other)				
	<input type="checkbox"/> partial e-learning					
	<input checked="" type="checkbox"/> field work					
2.8. Student responsibilities	Attendance lectures (55%) and exercises (64%); active participation at exercises; continuous assessment (1 preliminary exam – 20 questions).					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.45	Research		Practical training	
	Experimental work		Report		Participation at exercises	0.25
	Essay		Seminar essay		(other)	
	Tests	0.8	Oral exam	1	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Evaluation elements: 1. Attending lectures: 3-6 points (1 lecture hour equals 0.54 point) 2. Attending exercises: 8-12 points (1 lecture hour equals 0.48 point) 3. Participation at exercises: 5-10 points (evaluated with short oral tests) 4. Continuous knowledge checking (1 preliminary exam – 20 questions): 20-32 points (1 question equals 1.6 points) 5. Final exam – oral: 24-40 points (5 questions): 1 question equals 8 points					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	BARDACH, J. E., J. H. RYTHER, W. O. McLARNEY (1972): Aquaculture: The Farming and Husbandry of Freshwater and Marine organisms. Wiley-Interscience, New York-London-Sydney-Toronto.			1		
	HOLE, D., D. BUCKE, P. BURGESS, I. WELLBY (2001): Diseases of carp and other cyprinid fishes. Fishing News Books, London.			1		
	NOGA, E. J. (2000): Fish disease: Diagnosis and treatment. Iowa State University.			1		
	ROBERTS, R. J. (2001): Fish pathology. W. B. Saunders. London.			1		
	WOO, P. T. K., D. W. BRUNO (1999): Fish Diseases and disorders. Vol. 3.: Viral, bacterial and fungal infections. CABI Publishing.			1		
	PP presentations of lectures and exercises				LMS	

2.12. Optional literature (at the time of submission of study programme proposal)	<p>BOYD, C. E. (1990): Water Quality in Ponds for Aquaculture. Auburn University, Alabama, USA.</p> <p>FERGUSON, H. W. (2006): Systemic pathology of fish: A text and atlas of normal tissues in teleosts and their responses in disease. Scotian Press London.</p> <p>GREENBERG, D. B. (1960): Trout farming. Chilton company – book division, Philadelphia-New York.</p> <p>HORVATH, L., G. TAMAS, C. SEAGRAVE (1992): Carp and pond fish culture. Fishing News Book, Oxford.</p> <p>PLUMB, J. A. (1999): Health maintenance and principal microbial diseases of cultures fishes. Iowa State University.</p> <p>SINDERMANN, C. J. (1990): Principal diseases of marine fish and shellfish. Academic Press, London.</p>
2.13. Quality assurance methods that ensure the acquisition of exit competences	<p>Final exam – oral.</p> <p>At the Department there will be a Form for each student for keeping records of his/her lecture and exercises attendance and with a columns for evaluating his/her participation at exercises and for continuous knowledge checking.</p>
2.14. Other (as the proposer wishes to add)	<p>Anonymous student questionar about teacing work.</p>

GAME BREEDING AND MANAGEMENT

1. GENERAL INFORMATION			
1.1. Course teacher	Full professor Alen Slavica, PhD, DVM	1.6. Year of the study programme	4
1.2. Name of the course	Game Breeding and Management	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Full professor Zdravko Janicki, Associate professor Dean Konjević, PhD, DVM; Assistant professor Magda Sindičić, PhD, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	4+0+26
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	Level 1
2. COUSE DESCRIPTION			
2.1. Course objectives	By attending the Game breeding and management course students will gain the knowledge on peculiarities of natural and intensive breeding of different game species. They will gain the basic knowledge on natural sciences, animal welfare, handling and breeding as well as on legislative, Croatian and EU regulations of the aforementioned activities. The subject curriculum is formed in a way to inspire the bioethical approach to the game breeding, which is based on the newest welfare understanding and traditional game breeding system. Attendants can meet the essentials of selective work in game breeding, the models of intensive breeding of large and small game and guidelines for the game production. In practical part students gain knowledge and competency of game breeding, keeping and management particularly by sex and age determination, estimation of game breeding value, social structure evaluation, breeding technology comprehension (natural and farm breeding of small and large game) with etiologic base and welfare satisfaction at breeding and handling with stress on loading, hunting, binding, dazing, transport, weighing, operator risk determining etc. In that way the attendants will be able to master specialised skills and competence in expert activities of planning, conduction and improvement of intensive and natural game breeding.		
2.2. Course enrolment requirements and entry competences required for the course	To meet course entry competences student must have attended all courses of VI semester and passed the examination in the subjects General Pathology and Special Pathology		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - Implementation of intensive farming technology on wildlife species - Designing and sizing of breeding capacity - Application of bioethical principles in the breeding planning and implementation - Planning and implementation of natural and intensive game farming - Design and implementation of health surveillance in game breeding - Meeting the welfare of game by types of farming - Capture and restraint of wildlife, individually and collectively - Risk assessment in manipulation with wildlife species - The organization and implementation of chemical immobilization - Preparation and implementation of game transportation - Selection in game breeding 		

<p>2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</p>	<ul style="list-style-type: none"> - Development and Implementation of Game management plan and Game protection plan - Modeling of intensive farming of large and small game species - Design of a farm for breeding large and small game - Design and implementation of Hunting management plan - Planning and design of game management and technical facilities - Operation and maintenance game management and technical facilities - Nutrition and winter feeding of game - Introducing and rewilding of reared game - Estimation of the economic and rearing value of game - Application of methods for preventing detriments on game and form game 													
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td data-bbox="448 555 810 864" style="width: 50%; text-align: center;"> <p>Keynote lecture - 1 hour Wildlife Management I - 1 hour</p> </td> <td data-bbox="810 555 1394 864"> <p>Presentation of the curriculum, organization of lectures and exams; defining concepts - wild animals, game, wildlife and protected species, hunting management; models of farming. Game and hunting by the Hunting Act, ZOL, types of hunting grounds; Establishing redistribution of fields and forests; Population dynamics and rearing age, game planning in the natural rearing of game species</p> </td> </tr> <tr> <td data-bbox="448 864 810 1200" style="text-align: center;"> <p>Wildlife Management II - 1 hour Selection - 1 hour</p> </td> <td data-bbox="810 864 1394 1200"> <p>Components of HMP, glossary, definition of the hunting ground evaluation, determination hunt-productive area and hunt-management capacity; Funds of game – reproductive and total stock, growth and accretion, gain coefficient according to the type of hunting grounds and solvency. Selection work in the breeding cultivation of large game, the basic principles, selection according to the gender, selection by age categories.</p> </td> </tr> <tr> <td data-bbox="448 1200 810 1357" style="text-align: center;"> <p>Arrangement and maintenance hunting ground - 1 hour Detriments on game and form game - 1 hour</p> </td> <td data-bbox="810 1200 1394 1357"> <p>Technical arrangement of hunting ground, hunting management and technical facilities. Damage to wildlife and damage from wildlife, game road kills; measures of detriments prevention; detriments on game by nature</p> </td> </tr> <tr> <td data-bbox="448 1357 810 1603" style="text-align: center;"> <p>The principles of selection in game breeding, estimate age and gender - 2 hours</p> </td> <td data-bbox="810 1357 1394 1603"> <p>Selection in natural rearing of game, identification of game age categories, perspective and non perspective male and female, quality selection models and their adjustment to breeding goal, culling types, Practical work - selection in red deer, fallow deer, roe deer and mouflon population. Estimation of age.</p> </td> </tr> <tr> <td data-bbox="448 1603 810 1850" style="text-align: center;"> <p>Practical work in hunting ground – 6 hours</p> </td> <td data-bbox="810 1603 1394 1850"> <ol style="list-style-type: none"> 1. Setting up and dismantling electrical fences 2. Measures for technical arrangement of hunting grounds (HM and T objects) 3. Hygienic sanitation and maintenance of the HG and T facilities 4. IR cameras for wildlife 5. cartography 6. Survey of the field, drive counting </td> </tr> <tr> <td data-bbox="448 1850 810 1998" style="text-align: center;"> <p>Natural rearing of game and HMP - 2 hours</p> </td> <td data-bbox="810 1850 1394 1998"> <p>Practical: determining hunt productive area and prudential grades; calculation of the breeding stock, increment and culling, Determining hunt management capacity; fund development of big and small game species</p> </td> </tr> </table>		<p>Keynote lecture - 1 hour Wildlife Management I - 1 hour</p>	<p>Presentation of the curriculum, organization of lectures and exams; defining concepts - wild animals, game, wildlife and protected species, hunting management; models of farming. Game and hunting by the Hunting Act, ZOL, types of hunting grounds; Establishing redistribution of fields and forests; Population dynamics and rearing age, game planning in the natural rearing of game species</p>	<p>Wildlife Management II - 1 hour Selection - 1 hour</p>	<p>Components of HMP, glossary, definition of the hunting ground evaluation, determination hunt-productive area and hunt-management capacity; Funds of game – reproductive and total stock, growth and accretion, gain coefficient according to the type of hunting grounds and solvency. Selection work in the breeding cultivation of large game, the basic principles, selection according to the gender, selection by age categories.</p>	<p>Arrangement and maintenance hunting ground - 1 hour Detriments on game and form game - 1 hour</p>	<p>Technical arrangement of hunting ground, hunting management and technical facilities. Damage to wildlife and damage from wildlife, game road kills; measures of detriments prevention; detriments on game by nature</p>	<p>The principles of selection in game breeding, estimate age and gender - 2 hours</p>	<p>Selection in natural rearing of game, identification of game age categories, perspective and non perspective male and female, quality selection models and their adjustment to breeding goal, culling types, Practical work - selection in red deer, fallow deer, roe deer and mouflon population. Estimation of age.</p>	<p>Practical work in hunting ground – 6 hours</p>	<ol style="list-style-type: none"> 1. Setting up and dismantling electrical fences 2. Measures for technical arrangement of hunting grounds (HM and T objects) 3. Hygienic sanitation and maintenance of the HG and T facilities 4. IR cameras for wildlife 5. cartography 6. Survey of the field, drive counting 	<p>Natural rearing of game and HMP - 2 hours</p>	<p>Practical: determining hunt productive area and prudential grades; calculation of the breeding stock, increment and culling, Determining hunt management capacity; fund development of big and small game species</p>
<p>Keynote lecture - 1 hour Wildlife Management I - 1 hour</p>	<p>Presentation of the curriculum, organization of lectures and exams; defining concepts - wild animals, game, wildlife and protected species, hunting management; models of farming. Game and hunting by the Hunting Act, ZOL, types of hunting grounds; Establishing redistribution of fields and forests; Population dynamics and rearing age, game planning in the natural rearing of game species</p>													
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<p>Practical work in hunting ground – 6 hours</p>	<ol style="list-style-type: none"> 1. Setting up and dismantling electrical fences 2. Measures for technical arrangement of hunting grounds (HM and T objects) 3. Hygienic sanitation and maintenance of the HG and T facilities 4. IR cameras for wildlife 5. cartography 6. Survey of the field, drive counting 													
<p>Natural rearing of game and HMP - 2 hours</p>	<p>Practical: determining hunt productive area and prudential grades; calculation of the breeding stock, increment and culling, Determining hunt management capacity; fund development of big and small game species</p>													

	Health surveillance and veterinary profession in hunting 1 hour Profession training of qualified person in the hunting area 1 hour	The organization of health surveillance, Coprological monitoring , hygienic-sanitary measures, rules concerning inspection and transport of venison, regulations related to the disposal of carcasses. Competent person, official records. Practical work: filling out forms of spring growth and abundance of small and big game species	
	Equipment for capture and immobilization Capture and transport of game 2 hours	Methods of capturing wildlife, equipment and accessories for injection application; Application routes and technical means for immobilization; transport of large and small game, Game welfare in transport.	
	Chemical immobioization -2 hour	Decision making in immobilization drug selection and dose estimation, environmental and game conditions; Transport premedication; immobilization protocol and preparing the operator; professional procedure with immobilized beast; Technical problems and complications of manipulation and immobilization; prevention and elimination of complications	
	Chemical immobioization -2 hour	Practical work - Selecting immobilization drug on the game species; calculation of dose per kg / body weight and total dose of application, determination of percent concentration; Preparation sedatives, darts and capture guns for the application; darting targets	
	management of game outside the hunting area 2 hours	Management objectives, methods of monitoring and research, assessment and habitat improvement measures, reintroduction	
	Farm breeding big game - 2 hours	The spatial dimensions of the farm and small fenced area; Positioning farms and farming plants; farm grazed areas, corridors and 'Crush' systems for manipulation, protection of breeding areas and types of fences, farm nutrition and feeding, farm rearing of wild boars	
	Farming small furry and feathered game 2 hours	The technology of hare breeding, cage and polygon type farming methods re wilding methodology; technopathy morbidity and mortality in farm breeding, farm breeding of pheasants, partridge and quail; facilities in the breeding of game birds; formation of broodstock and selection of breeding stock; Phase breeding of game birds and nutrition standards , methods and effectiveness of pheasants and partridge release, preparing hunting area for game birds release; facilities for the reception and releasing game birds in hunting area; technopathy and diseases game birds in farm breeding	
2.6. Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning X field work	X independent assignments X multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:
2.8. Student responsibilities	Attending lectures (50%), exercise (70%), active participation in exercises and seminars, self support task/problem solving, continuous preliminary exam (once).		

2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,18x2,5=0,45	Research		Practical training	0,1x2,5=0,25
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	0,32x2,5=0,8	Oral exam	0,3x2,5=0,75	(other)	
	Written exam	0,1x2,5=0,25	Project		(other)	

2.10. Grading and evaluating student work in class and at the final exam	Type of activity	Minimal points	Maximal points
	Attending lecture (4 hour lecture)	3 (coefficient 1,5) 2x1,5=3 (student must be minimally in two-hour lecture in order to achieve the minimum 3 points)	6 6:4=1,5 (coefficient 1,5)
	Attending exercise	8	12
	(26 hours of practice work =13 programs)	(coefficient 0,46) 18 x 0,45 = 8 (the student must be at least 18 hours of practice in order to achieve the minimum 8 points)	12 : 26=0,45 (coefficient 0,45)
	Participation at exercise	5 (coefficient 0,5) 4x0,5=2 points	10 (2)
	Solving a problem at exercise = 0,5 point x problem	(coefficient 2) 2x2=4 points	(4)
	Dedication at solving a field problem	(coefficient 1) 4 x1=4 points	(4)
	2 points for a solved problem (2 x field task)	The student must achieve minimum 5 points total from all three types of activities	
	Preparation for exercise		
	1 point = one correct and complete answer at exercises		
2 x preliminary exam 16 questions per exam 1 question = 1 point 16 x 1 = 16 points Total = 32 points	(2x10) 20 (coefficient 1) 10 x 1 =10 (a student must have 10 correct answers to get minimum 10 points per each exam)	32 32 :32=1 (coefficient 1)	
Final exam	20	40	
(Oral exam) 1 question = 5points(max.) 8 questions = 40 points	To pass the oral part of the exam a student must gain minimal 20 points	maximal 40 points at the oral exam 2 point for 'sufficient' 3 points for 'good' 4 points for 'very good' 5 points for a 'excellent' oral answer per question	
TOTAL	56	100	

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	1. Haigh, J. C., R. J. Hudson (1993): Farming Wapiti and Red Deer. Mosby-Year Book, Inc., St. Louis, Missouri, USA		
	2. Nielsen, L. (1999): Chemical Immobilization of Wild and Exotic Animals. Iowa State University Press, Ames, Iowa, USA		
	3. Schemnitz, S. D. (Ed) (1980): Wildlife Management Techniques Manual. The Wildlife Society, Inc., Maryland, USA		
2.12. Optional literature (at the time of submission of study programme proposal)	1. Reid, H. W. (1988): "The Management and Health of Farmed Deer". Kluwer Academic Publishers, Boston, London.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	<p>1. Presence at lectures and presence in exercises</p> <p>2. Continuous assessment</p> <p>3. Participation in the training</p> <p>4. Final exam</p> <p>The student must be present at the two-hour lecture to get minimum 3 points. The maximum number of points on 6</p> <p>The student must be present at the 18 hours of practice to get minimum 8 points. The maximum number of points is 12</p> <p>During program exercise in the practicum student must answering questions to prove preparedness. Each correct and complete answer carries 0.5 points. The minimum number of points in this assessment is 5. The maximum number of points is 10.</p> <p>Knowledge is written preliminary twofold checks after the first and after second half of the treated material. The minimum number of points is 20, and the maximum number of points is 32.</p> <p>To access the final exam, the student must be in the school district, or by scoring the previous elements of assessment to collect a minimum of 36 out of a possible 60 points.</p> <p>The final exam is oral examination. Student answers the eight questions asked. Each correct and complete answer brings 5 points. The minimum number of points is 20. The maximum number of points is 40- At the oral examination by the each answer 0-5 points are given, with a minimum of 2 points per answer.</p>		
2.14. Other (as the proposer wishes to add)			

GENERAL AND CLINICAL RADIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Damir Stanin, MSc, PhD	1.6. Year of the study programme	4 th
1.2. Name of the course	General and Clinical Radiology	1.7. Credits (ECTS)	3.5
1.3. Associate teachers	Prof. Damir Stanin, MSc, PhD Assist. Prof. Zoran Vrbanac, PhD, DACVSMR, DECVSMR Assist. Prof. Hrvoje Capak, PhD Tomislav Bureš, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 L + 30 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	In the general part of the course the student is introduced to basics of X-rays physics, X-rays and CT devices and positioning. Both plain and digital radiography procedures will be covered. Interpretation protocols, projection effects and contrast survey will be explained to the student. In the clinical part of the subject, the theoretical and practical education of radiological diagnostic of different body systems (skeletal, digestive, respiratory, cardiovascular, and urogenital) will be covered. During the practical work, student will gain experience in analyses and interpretation of radiographs, composing the findings and determine the diagnosis.		
2.2. Course enrolment requirements and entry competences required for the course	3 rd year courses		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol style="list-style-type: none"> 1. to understand the physics of x-ray image, potential harmful effect of x-ray and protection 2. to perform the x-ray survey and the image processing 3. to analyse and interpret different anatomical structures and opacities with the goal of determining the diagnosis 4 to choose and apply suitable contrast survey and to compare it with plain radiographs 5. to evaluate the diagnostic possibility in different pathological conditions and to determine the possible use of radiological exam 		
2.5. Course content broken down in detail by	LECTURES: Introduction, X-ray and CT machines and physics of X-rays, application of X-rays in diagnostics, plain and digital radiography, general radiological anatomy and physiology, general radiological pathology, radiological diagnostics of skeletal system diseases, radiological diagnostics of respiratory		

weekly class schedule (syllabus)	<p>organs diseases, radiological diagnostics of cardiovascular system diseases, radiological diagnostics of gastrointestinal diseases, radiological diagnostics of urogenital system diseases.</p> <p>PRACTICAL: X-ray and CT equipment, X-ray film, X-ray cassette, developing procedures, radiographic image, opacities. Fluoroscopy indications and procedure. Radiological anatomy, plain and contrast survey, contrast medium. Positioning techniques, positioning effects. Hazards of X-ray production, X-ray scattering removal.</p> <p>General radiological pathology: normal, increased, decreased opacity intensity, change in shape, size, position and function.</p> <p>Radiological diagnostics of pathological conditions of respiratory, cardiovascular, gastrointestinal, urogenital and skeletal systems.</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	18%	Research		Practical training	10%
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	32%	Oral exam	40%	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>Evaluation elements:</p> <ol style="list-style-type: none"> 1. Attending lectures 2. Attending exercises 3. Participation at exercises 4. Continuous knowledge checking 5. Final exam <p>Attending lectures 3-6 points (15 lecture hours. 1 lecture hour is worth 0.4 point). A student must attend minimal 8 lecture hours.</p> <p>Attending exercises 8-12 points (8 programmes. 1 programme (double period) is worth 1.6 points). A student must attend minimal 5 programmes.</p> <p>Participation at exercises 5-10 points – participation at exercise will be evaluated with short oral tests with 5 points at least two times.</p> <p>Continuous knowledge checking 20-32 points</p> <p>1st preliminary exam (10 questions) 10 points min. – 16 points max. (1 question is worth 1.6 points)</p> <p>2nd preliminary exam (10 questions) 10 points min. – 16 points max. (1 question is worth 1.6 points)</p> <p>ORAL EXAM: 24-40 points (5 questions : 1 question is worth 8 points)</p> <p>To take the final exam a student must gain minimal 16 points from attending lectures and exercises and participation at exercises and minimal 20 points from continuous knowledge checking.</p> <p>The total sum of points gained from all evaluation elements is expressed by a grade from 1 to 5 (the following table).</p>					

	<i>Points</i>	<i>Grade</i>		
	up to 59	1 (F)		
	60-68	2 (E)		
	69-76	2 (D)		
	77-84	3 (C)		
	85-92	4 (B)		
	93-100	5 (A)		
	<p>At the Department there will be a Form for each student for keeping records of his/her attendance of the lectures and exercises with a column for evaluating his/her participation exercises. In the part of continuous knowledge checking there will be: the date of taking the preliminary exam, the name of the lecturer and the number of gained points.</p> <p>At the final exam the Form with the total number of points gained from all evaluation elements will be presented to the lecturer</p>			
	Types of activities	Minimal number of points	Maximal number of points	
	Attending lectures	3	6	
Attending exercises	8	12		
Participation at exercises	5	10		
Continuous knowledge checking	20	32		
Final exam	24	40		
Total	60	100		
<p>In order to take the final exam a student must gain minimal 36 points from attending and participation at lectures and exercises and from continuous knowledge checking.</p>				
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media	
	Kealy J. Kevin, Hester McAllister (2004.): Diagnostic Radiology and Ultrasonography of the Dog and Cat, 4th Edition, Philadelphia	2		
	Thrall D.E. (2013.): Textbook of Veterinary Diagnostic Radiology. Saunders. St. Louis, Missouri	2		
2.12. Optional literature (at the time of submission of study programme proposal)				
2.13. Quality assurance methods that ensure the acquisition of exit competences				
2.14. Other (as the proposer wishes to add)				

INTERNAL MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Vesna Matijatko, professor	1.6. Year of the study programme	IV
1.2. Name of the course	Internal Medicine	1.7. Credits (ECTS)	16
1.3. Associate teachers	Vesna Matijatko, professor, Nikša Lemo, DECVD, professor, Damjan Gračner, professor, Nada Kučer, assoc. professor, Ivana Kiš, assoc. professor, Mirna Brkljačić, assistant professor, Martina Crnogaj, assistant professor Marin Torti, assistant professor, Iva Šmit, assistant professor Jelena Gotić, PhD, DVM, Ines Jović, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	L90 + E120
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	10
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Diagnosis and treatment of the diseases of digestive, cardiovascular, respiratory and urinary system, as well as diagnosis and treatment of neurological, endocrinological, hematopoetic, neoplastic, dermatological diseases in domestic animals. Basics of emergency and critical care medicine.		
2.2. Course enrolment requirements and entry competences required for the course	Anatomy of domestic animals, physiology of domestic animals, Pathophysiology of domestic animals, Pharmacology, Clinical propedeutics.		
2.3. Learning outcomes at the level of the programme to which the course contributes	During studying internal medicine students acquire and consolidate their medical logics based on medical premises gained in study of preclinical subjects. Such an approach enables forming of experts disposed to new knowledge and independent on stereotypes. They check their approach by lab diagnostic aids. Upon acquisition on teaching matter a student is able to examine the patient, notice disease symptoms, establish a proper diagnosis, check it by additional lab tests and finally determine the proper treatment of diseases within internal medicine at the level of general veterinary medicine. Thereby, a student is well prepared and trained to take part in attending the further clinical courses, as well as those belonging to public veterinary health.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol style="list-style-type: none"> 1. Students will be able to establish a diagnosis based on disease history and clinical examination. 2. Students will have adequate knowledge to make a list of differential diagnoses and to decide which advanced clinical methods should be used to establish a final diagnosis. 3. Students will be able to interpret the results of various findings. 		

	<p>4. Students will be able to select an adequate treatment according to symptoms and diagnosis.</p> <p>5. On the basis of the trend of various findings students will be able to modify the treatment.</p> <p>6. On the basis of everything afore mentioned, students will be able to establish a prognosis.</p>
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>Dermatology. Inflammatory diseases of the skin. Pruritus. Allergies. Otitis externa. Dermatology of cats. Immune mediated skin diseases. Burns, hypovitaminoses, endocrinologic imbalance. Clinical pathology. Anemia. Polycythemia. Leukopenia, leucocytosis, leukaemias. Coagulopathies, hemorrhagic diatheses. Blood types, blood transfusion. Interpretation of laboratory results – enzymes. Interpretation of laboratory results – metabolites. Digestive system. Clinical signs and diagnostics of digestive system diseases. Mouth, pharynx and oesophagus. Gastric dilatation volvulus. Gastritis, gastric ulcer. Inflammatory bowel disease. Enteritis, colitis, ileus, constipation. Hepatic diseases – hepatitis, portosystemic shunt, hepatic lipidosis. Pancreatic diseases – acute and chronic pancreatitis, exocrine pancreatic insufficiency. Urinary system. Clinical signs and diagnostics of urinary tract diseases. Acute renal failure. Chronic renal failure. Lower urinary tract inflammation, urolithiasis, FLUTD, urethral obstruction in cats. Cardiology. Clinical signs and diagnostics of heart and pericardium diseases. Congenital heart diseases. Valve diseases. Cardiomyopathies. Arrhythmias. Pericardial diseases. Respiratory system. Rhinitis, sinusitis. Diseases of larynx and trachea. Bronchitis. Pneumonias. Pneumothorax, pleural effusions. Endocrinology. Diagnostic of endocrinology diseases. Diabetes insipidus. Hypothyreosis, hyperthyreosis. Hypoadrenocorticism, hyperadrenocorticism. Diabetes mellitus. Diabetic ketoacidosis and other complication of diabetes. Insulinoma and other hormonally active neoplasms. Neurology. Clinical signs and diagnostics of neurological diseases. Vestibular disease. Seizures. SRMA and other inflammatory diseases of nervous system. Diseases of spine. Myasthenia gravis and other diseases of the peripheral nervous system. Behavioural disorders. Oncology. Approach to a patient with mass, bump and lump - clinical signs and diagnostic of neoplastic diseases. Paraneoplastic syndrome. The most frequent neoplasms – lymphoma, mastocytoma, melanoma, hemangiosarcoma, mammary gland adenocarcinoma, TNCC. Life quality assessment and palliative care of patient with malignant neoplasms. Emergency and critical care medicine. Triage and CPR. Respiratory distress. Shock. Selected emergencies. Critical care. Diseases of ruminants. Alimentary indigestions. Traumatic indigestion. Ruminal tympany (bloat): acute, chronic, frothy. Pyelonephritis and other urinary tract diseases. Ketosis. Bronchopneumonia and other respiratory diseases. Tetany, vitamin and mineral metabolism disorders. Ketosis and hepatic steatosis in sheep and goats, and other significant diseases of sheep and goats. Swine diseases. Anemia in piglets, hypoglycemia in piglets, multiple degeneration of muscles and myocardium in swine. Peptic ulcer. Specific vitamin and mineral deficiencies. Equine diseases. Features of clinical signs, diagnostics and treatment of equine diseases. Equine cardiology – features of ECG, equine heart diseases. Recurrent airway obstruction (equine asthma) and other respiratory diseases. Colic. False colic and urinary tract diseases. Exercise (paralytic) myoglobinuria and equine atypical myopathy. Neurology of large animals. Dermatology of large animals. Small mammal diseases. Selected diseases of ferrets: insulinoma, FADC, lymphoma, myocardiopathies. Selected diseases of rabbits and rodents (malocclusion, gastrostasis, pneumonias, urolithiasis, vestibular disease).</p>

2.6. Format of instruction:	+ lectures <input type="checkbox"/> seminars and workshops + exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		+independent assignments <input type="checkbox"/> multimedia and the internet +laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	1	Research		Practical training attendance	1,9
	Experimental work		Report		Practical training activity	1,6
	Essay		Seminar essay		(other)	
	Tests	5,1	Oral exam	2,5	(other)	
	Written exam	3,8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Ettinger S.J., Feldman, E.C.: Textbook of Veterinary Internal Medicine Expert Consult: Expert Consult, 8 th edition, Saunders, Elsevier, USA, 2017					
	Radostits, O.M, Gay, C. C., Hinchcliff, K. W., Constable, P. D.: Veterinary Medicine: A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses 9th Edition, Saunders, Elsevier, USA					
2.12. Optional literature (at the time of submission of study programme proposal)						
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuing knowledge assessment, Internal diseases test, final exam					
2.14. Other (as the proposer wishes to add)						

METHODS OF PHYSICAL THERAPY AND DIAGNOSTICS

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Zoran Vrbanac, PhD, DACVSMR, DECVSMR	1.6. Year of the study programme	4 th
1.2. Name of the course	Methods of physical therapy and diagnostics	1.7. Credits (ECTS)	2,5
1.3. Associate teachers	Prof. Damir Stanin, MSc, PhD Assist. Prof. Zoran Vrbanac, PhD, DACVSMR, DECVSMR Assist. Prof. Hrvoje Capak, PhD Tomislav Bureš, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 L + 15 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The course objective is to explain the different forms of artificial and natural energy and its use in treatment and prophylaxis. Student will get acquainted with most frequently used physical therapy modalities as well as ultrasound diagnostic.		
2.2. Course enrolment requirements and entry competences required for the course	3 rd year courses		
2.3. Learning outcomes at the level of the programme to which the course contributes	The 4 th year student will gain the insight in methods and modalities of physical therapy and diagnostic used in rehabilitation protocols. Upon attended course student is able to determine indications for physical therapy and can apply different forms of rehabilitation procedures and protocols.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1- introduction to different methods of physical therapy and their effect on body systems 2- to apply and to determine the duration of the methods depending on clinical condition 3- to evaluate the outcome of physical therapy treatment 4- to interpret ultrasound image of different body system		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	LECTURES: Introduction and basic part, physiological effect of warmth and cold application, hydrotherapy, therapy with curative mud, electrotherapy – low and high frequency currents, phototherapy – heliotherapy, lucotherapy, chromo therapy, treatment with ultraviolet rays. Therapeutic exercises and massage, therapeutic ultrasound, diagnostic ultrasound, laser therapy PRACTICAL: hydrotherapy, thermotherapy, electrotherapy, phototherapy, therapeutic exercises, massage, therapeutic ultrasound, diagnostic ultrasound.		
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> independent assignments	2.7. Comments:
	<input type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet	
	<input checked="" type="checkbox"/> exercises	<input type="checkbox"/> laboratory	
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor	
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)	
	<input type="checkbox"/> field work		

2.8. Student responsibilities																				
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	6%	Research		Practical training	12%														
	Experimental work	10%	Report		(other)															
	Essay		Seminar essay		(other)															
	Tests	32%	Oral exam	40%	(other)															
	Written exam		Project		(other)															
2.10. Grading and evaluating student work in class and at the final exam	<p>Evaluation elements:</p> <ol style="list-style-type: none"> 1. Attending lectures 2. Attending exercises 3. Participation at exercises 4. Continuous knowledge checking 5. Final exam <p>Attending lectures 3-6 points (15 lecture hours. 1 lecture hour is worth 0.4 point). A student must attend minimal 8 lecture hours. Attending exercises 8-12 points (8 programmes. 1 programme (double period) is worth 1.6 points). A student must attend minimal 5 programmes. Participation at exercises 5-10 points – participation at exercise will be evaluated with short oral tests with 5 points at least two times. Continuous knowledge checking 20-32 points 1st preliminary exam (10 questions) 10 points min. – 16 points max. (1 question is worth 1.6 points) 2nd preliminary exam (10 questions) 10 points min. – 16 points max. (1 question is worth 1.6 points) ORAL EXAM: 24-40 points (5 questions : 1 question is worth 8 points) To take the final exam a student must gain minimal 16 points from attending lectures and exercises and participation at exercises and minimal 20 points from continuous knowledge checking. The total sum of points gained from all evaluation elements is expressed by a grade from 1 to 5 (the following table).</p> <table border="1" data-bbox="469 1265 1252 1547"> <thead> <tr> <th><i>Points</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table> <p>At the Department there will be a Form for each student for keeping records of his/her attendance of the lectures and exercises with a column for evaluating his/her participation exercises. In the part of continuous knowledge checking there will be: the date of taking the preliminary exam, the name of the lecturer and the number of gained points. At the final exam the Form with the total number of points gained from all evaluation elements will be presented to the lecturer</p>						<i>Points</i>	<i>Grade</i>	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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Continuous knowledge checking	20	32																		

	Final exam	24	40
	Total	60	100
	In order to take the final exam a student must gain minimal 36 points from attending and participation at lectures and exercises and from continuous knowledge checking.		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Millis, D.L., D. Levine, R.A. Taylor: Canine Rehabilitation and Physical Therapy. Second edition. Elsevier, Philadelphia, 2014	3	
	Bockstahler, B, D. Levine, D. Millis: Essential Facts of Physiotherapy in Dogs & Cats - Rehabilitation and Pain Management, BE VetVerlag Babenhausen, 2004.	1	
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

OBSTETRICS AND REPRODUCTION I

1. GENERAL INFORMATION			
1.1. Course teacher	Juraj Grizelj, Full Prof	1.6. Year of the study programme	4 (VIII semester)
1.2. Name of the course	Obstetrics and Reproduction I	1.7. Credits (ECTS)	12.5
1.3. Associate teachers	Goran Bačić, Full Prof, Tomislav Dobranić, Full Prof, Tugomir Karadjole, Full Prof, Marko Samardžija, Full Prof, Iva Getz, Assoc. Prof, Martina Lojkić; Assoc. Prof, Nino Maćešić, Assoc. Prof, Nikica Prvanović Babić, Assoc. Prof, Silvijo Vince, Assoc. Prof, Ivan Folnožić, Assist. Prof, Branimira Špoljarić, Assist. Prof, Ivan Butković, Assistant, DVM; Juraj Šavorić, Assistant, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	60 + 0 + 100+5 + 0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated Undergraduate and Graduate University Study of Veterinary Medicine in English	1.9. Expected enrolment in the course	25
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	Within the course framework, the students will get acquainted in detail with the hormonal regulation of the sexual cycle of domestic animals, including phases, a clinical signs of sexual cycle and the artificial insemination of domestic animals. Students will also be thoroughly familiarized with oogenesis, the mechanism of ovulation, fertilization, nidation and placentation, as well as pregnancy, pregnancy diagnostics and pathology of pregnancy and the phases of parturition, physiology and pathology of puerperium, spermiology, and udder.		
2.2. Course enrolment requirements and entry competences required for the course	Students are required to previously complete the courses of the General Veterinary Pathology and Special Veterinary Pathology. They should be able to take the animal's history, restrain it in a safe way and perform a general clinical examination. The student should be able to propose diagnostic examinations and understand the principles of the therapeutical approach which could be performed on the gynaecologic patient. Also, students should have basic knowledge of sexual hormone structure and function, anaesthesiology protocols and aseptic and antiseptic principles.		
2.3. Learning outcomes at the level of the programme to which the course contributes	To be able to independently take the gynaecologic history and perform gynaecological / andrological examinations (including udders) of female and male animals, including rectal palpation and ultrasound checking, in order to define the animal's reproductive status. To be able to timely perform artificial insemination, understand the principles of semen collection and insemination dose, and perform basic semen tests.		

	<p>To be able to properly assist labour and apply obstetrical methods in case of need.</p> <p>To check post-parturient animal and determine if the puerperium of the animal is running physiologically; and if not, to be able to assess the proper therapeutic approach.</p> <p>To assess general conditions at the farm level which influence optimal animal reproduction and milk production, overall animal production at the farm level, animal welfare and safety of animal products.</p>					
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>to explain the neurohormonal regulation of sexual cycles of domestic animals;</p> <p>to independently perform andrologic and gynaecological examinations of domestic animals;</p> <p>to clearly distinguish phases and clinical specificity of the sexual cycle of domestic animals;</p> <p>to apply proper methods of pregnancy diagnostics and artificial insemination;</p> <p>to be acquainted with the physiology and pathology of puerperium;</p> <p>to be acquainted with the physiology and pathology of the mammary gland;</p> <p>to identify and explain the stages of parturition.</p>					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Introduction to the hormonal regulation of the sexual cycle; sexual cycle specificity in cows and heifers; sexual cycle specificity in mares; sexual cycle specificity in sows; sexual cycle specificity in sheep and goats; sexual cycle specificity in bitches and queens; oogenesis and folliculogenesis; hormonal regulation of ovulation; fertilization and embryo nidation; placentation; physiology of pregnancy, pregnancy diagnostics; physiology of delivery; spermiology; artificial insemination; physiology and pathology of puerperium; physiology and diseases of mammary gland.</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	<p>Students are obliged to attend at least 30 lecture hours and 73 hours of practicals. A minimum of 5 (max. 10) points must be gained during practicals, which consists of the completion of a minimum of 3 (max. 6) positively evaluated assignments imposed by teacher and based on active participation during practicals (signed off by the teacher), 1 (max 2) field assignment and 1 (max 2) positive answer on short oral exams.</p>					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.75	Research	-	Practical training	
	Experimental work	-	Report	-	Activity	2.75
	Essay	-	Seminar essay	-	(other)	
	Tests	4	Oral exam	5	(other)	
	Written exam	-	Project	-	(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>By attending lectures the student gains 3-6 points (60 lecture hours; each lecture hour equals a 0.1 coefficient). Students must attend at least 30 lecture hours.</p> <p>By attending practicals the student gains 8-12 points (105 exercise hours; each exercise hour equals a 0.11 coefficient). Students must attend at least 73 exercise hours.</p> <p>The activity at the exercises is evaluated with 5-10 points; the activity will be evaluated through short oral exams, field tasks and practical assignments.</p> <p>There will be a progress test performed during the semester consisting of 10 questions and performed in written form.</p>					

	<p>The progress test brings 32 points (each question equals a 3.1 points), 20 points being the minimum required to pass. Taking the progress test during the main term is compulsory (missing the main term needs to be justified). 3 additional progress test terms will be announced, as per agreement with students.</p> <p>(A passing grade for) the progress test is a requirement in order to register for the final exam. However, the progress test is not a requirement for a signature in the grade book. If the student fails the progress test 4 times, he/she needs to take the whole course over again. In case he/she doesn't take the progress test or fails it 4 times, an additional term is possible if the student representative writes an official request to the respective Vice Dean. The Course leader makes the final decision.</p> <p>In order to take the final exam, a student must gain a minimum of 16 points by attending lectures and, practicals and through activities during practicals, and at least 20 points from continuous knowledge assessments. The final exam consists of 10 oral questions and in total brings up to 40 points (a minimum of 24 points to pass). The total sum of points achieved from the above-mentioned elements is expressed in the final mark (1 – 5), 1 being a fail.</p> <table border="1" data-bbox="475 745 1315 1025"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F) insufficient</td> </tr> <tr> <td>60-68</td> <td>2 (E) sufficient</td> </tr> <tr> <td>69-76</td> <td>2 (D) sufficient</td> </tr> <tr> <td>77-84</td> <td>3 (C) good</td> </tr> <tr> <td>85-92</td> <td>4 (B) very good</td> </tr> <tr> <td>93-100</td> <td>5 (A) excellent</td> </tr> </tbody> </table>			Points	Grade	up to 59	1 (F) insufficient	60-68	2 (E) sufficient	69-76	2 (D) sufficient	77-84	3 (C) good	85-92	4 (B) very good	93-100	5 (A) excellent				
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Senger, P. L. (2012): Pathways to Pregnancy and Parturition. 3 rd edition. Current Conceptions, Inc.	1	-																			
Jackson, P. G. G. (2004): Handbook of Veterinary Obstetrics. Saunders W. B. Company.	1	-																			
Constable, P. D., K. W. Hinchcliff, S. H. Done, W. Grünberg, O. M. Radostits (2017): Veterinary medicine : a textbook of the diseases of cattle, horses, sheep, pigs and goats. St. Louis, Mo. : Elsevier. Pp. 1904-1998.	1	-																			
Green, M. (2012): Dairy herd health. CAB International. Pp. 117-168.	1	-																			
2.12. Optional literature (at the time of submission of the study programme proposal)	<ul style="list-style-type: none"> - Jonston, Kustritz, Olson (2003): Canine and Feline Theriogenology. Saunders Company Ltd. - Simpson, G. (2008): BSAVA Manual of Small Animal Reproduction and Neonatology. British Small Animal Association. Gloucester - Blanchard, T. L et al., (2003): Manual of Equine Reproduction. Mosby. - BSAVA Manual of Canine and Feline Abdominal Surgery. Williams and Niles (eds.), BSAVA, 2005 - Gary Landsberg, Wayne L. Hunthausen, Lowell J. Ackerman (2003): 5.Handbook of Behavioural Problems of the Dog and Cat. Saunders W. B. Company - Angus O. McKinnon (1993): Equine Reproduction. LEA & FEBIGER - Gordon, I. (1997): Controlled Reproduction in Pigs. CAB International. 																				

	<ul style="list-style-type: none"> - JC Samper (2000): Equine Breeding Management and Artificial Insemination. Saunders - The Merck Veterinary Manual, 10th edition, (2010), Merck & Co. - Hafez (1993): Reproduction in Farm Animals. Lea and Febiger. - Pugh (2002): Sheep and Goat Medicine. Saunders - Smith and Sherman (2009): Goat Medicine. Wiley Blackwell - Solaiman (2010): Goat Science and Production. Wiley Blackwell - Paterson, B. (2001): Colour Atlas of Clinical Anatomy of the Dog and Cat. Mosby - Wagner H. (1995): The Biology and Medicine of Rabbits and Rodents. Williams & Wilkins - Baker L. (2000): Colour Atlas of Cytology of the Dog and Cat, Mosby - Blowey, R., P. Edmondson (2010): Mastitis Control in Dairy Herds 2nd ed. CAB International. - Hogeveen, H. (2005): Mastitis in dairy production. Wageningen Academic Publisher
2.13. Quality assurance methods that ensure the acquisition of exit competences	Regular classes' attendance-checking, continuous student activity assessment during the entire semester; continuous knowledge checking (progress tests), regular student consultation, students' questionnaire.

SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY I

1. GENERAL INFORMATION			
1.1. Course teacher	Ass.prof. Tomislav Babić: Phd;/Ass. Prof. Marko Pećin; Phd	1.6. Year of the study programme	7 th (the seventh)
1.2. Name of the course	Surgery, orthopaedics and ophthalmology I	1.7. Credits (ECTS)	7
1.3. Associate teachers	Ass. prof. Tomislav Babić, PhD; Acad.Dražen Matičić, PhD; Prof. Boris Pirkić; PhD;. Ass. Prof. Mario Kreszinger, PhD; Prof. Berislav Radišić, PhD; Prof. Dražen Vnuk; PhD; Ass. Prof. Ozren Smolec, PhD, Ass. Prof. Nika Brkljača Bottegaro; PhD, Ass. Prof. Marko Pećin, PhD, Andrija Musulin; PhD, Valentina Plichta, DVM,	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+0+60
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	25
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	1 Introduction to surgery, organisation of work at the clinics. Premises and equipment of the surgical clinics 2 Surgical instruments 3 Procedure, approach, inhibition and refutation of surgical patients 4 History and surgical propedeutics 5 Principles of surgical asepsis and antisepsis. Sterilization and disinfection. 6 Introduction to anaesthesiology. Premedication and sedation. Anaesthesia classification. Local and regional anaesthesia. Intravenous anaesthesia. 7 Inhalatory anaesthesia. 8 Shock: Diagnostics and treatment 9 Therapy with liquids and acid-base equilibrium 10 Disorders of coagulative mechanism and haemostasis 11 Injuries and wounds; Definition, aetiology and classification. Healing and basic principles of treatment. 12 Surgical procedures of burns, congelations and injuries caused by electricity, radiation and chemicals 13 Surgical techniques of knotting 14 Materials for stitching 15 Bandages, compresses, drainage 16 Infections and the use of antibiotics in surgery 17 Essential reconstruction surgeries (stitches, lobes, grafts)		
2.2. Course enrolment requirements and entry competences required for the course	Upon gaining of provided skills and knowledge a student is capable of taking history, treating and restraining the animal in a safe and a human way, teaching the others the same techniques, and performing the whole clinical examination. The student is ready to give his/her opinion of the other additional diagnostic examinations which are to be done on the surgical patient. In postoperative period a student can determine the way of treatment (pain control, treatment with antibiotics, physical therapy and other was of treatment). By this programme a student acquires knowledge of performing the surgical and anaesthesiologic protocol and taking records in the book of a patient in a way understandable to his/her profession and the public. He/she is well educated to		

	<p>apply correctly the principles of sterilization of surgical equipment and principles of aseptic surgery. The student is capable to apply safely the sedation, local and general anaesthesia and to estimate and control the pain. He/she is ready to recognise states indicating appropriateness of euthanasia and make it in a human way understanding the emotional state of the owner. The student can apply techniques of first aid 25 points (first exercises – thematic – participation is not evaluated, second exercises –thematic – participation is not evaluated, third exercises – 5 points max, fourth exercises -5 points max., fifth exercises – thematic –participation is not evaluated, sixth exercises – thematic –participation is not evaluated, seventh exercises -5 points max., eighth exercises – 5 points max., ninth exercises -5 points max) = keeping records of anaesthesiologic protocols in an orderly manner</p> <p>25 points (first exercises – thematic – participation is not evaluated, second exercises –thematic – participation is not evaluated, third exercises – 5 points max, fourth exercises -5 points max., fifth exercises – thematic –participation is not evaluated, sixth exercises – thematic –participation is not evaluated, seventh exercises -5 points max., eighth exercises – 14 points max., ninth exercises -5 points max) = active participation in the work with patients</p> <p>The number of points students must gain in order to earn minimal 5 points is 37,5. Participation of students at exercises will be checked continuously.</p>
<p>2.3. Learning outcomes at the level of the programme to which the course contributes</p>	<p>To be able independently take history, treating and restraining animal in safe and a human way and performing the whole clinical examination.</p> <p>To be ready to give his/her opinion of the other additional diagnostic examinations which are to be done on the surgical patient.</p> <p>To be able to determine the way of treatment in postoperative period (e.g. pain control, treatment with antibiotics, physical therapy and other what was required).</p> <p>To be able to perform the surgical and anaesthesiologic protocol and taking records in the book of a patient in a way understandable to his/her profession and the public.</p> <p>To be able to apply correctly the principles of sterilization of surgical equipment and principles of aseptic surgery.</p> <p>To be able to apply safely the sedation local and general anaesthesia and to estimate and control the pain.</p> <p>To be able to recognise states indicating appropriateness of euthanasia and make it in human way understanding the emotional state of the owner.</p>
<p>2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</p>	<p>to take history, treating and restraining the animal in a safe and human way and perform the whole clinical examination;</p> <p>to propose the other additional diagnostic examination which are needed to get objective status of the surgical patient;</p> <p>to determine the way and content of treatment in postoperative period of patient;</p> <p>to perform to surgical and anaesthesiologic protocol and taking record in the book of patient in a way understandable to his/her profession and the public;</p> <p>to apply safely the sedation, local and general anaesthesia and to estimate the control of the pain;</p> <p>to recognise states indicating appropriateness of euthanasia and make it in a human way understandable to the emotional state of the owner;</p> <p>to apply techniques of first aid giving in case of bleeding, wounds, burns and congelations;</p> <p>to perform techniques involving workup and bandaging the wounds, immobilisation and arresting bleeding;</p> <p>to assist during surgical procedures, honing the principles of aseptic surgery;</p> <p>to be able to conservatively and surgically workup small wounds;</p> <p>to be acquainted with basic techniques of stitching of organs and tissues and to choose adequate stitching material;</p>

2.5. Course content broken down in detail by weekly class schedule (syllabus)	Introduction to surgery, organisation of work at the clinics. Premises and equipment of the surgical clinics; Surgical instruments; Procedure, approach, inhibition and refutation of surgical patients; History and surgical propedeutics; Principles of surgical asepsis and antisepsis. Sterilization and disinfection; Introduction to anaesthesiology. Premedication and sedation. Anaesthesia classification. Local and regional anaesthesia. Intravenous anaesthesia; Inhalatory anaesthesia; Shock: Diagnostics and treatment; Therapy with liquids and acid-base equilibrium; Disorders of coagulative mechanism and haemostasis; Injuries and wounds; Definition, aetiology and classification. Healing and basic principles of treatment; Surgical procedures of burns, congelation and injuries caused by electricity, radiation and chemicals; Surgical techniques of knotting; Materials for stitching; Bandages, compresses, drainage; Infections and the use of antibiotics in surgery; Essential reconstruction surgeries (stitches, lobes, grafts)					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	attending lectures attending exercises participation at exercises continuous knowledge checking final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,42	Research		Practical training	0,84
	Experimental work		Report		Activity during practical training	0,7
	Essay		Seminar essay		(other)	
	Tests	2,24	Oral exam	1,4	(other)	
	Written exam	1,4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>Upon gaining of provided skills and knowledge a student is capable of taking history, treating and restraining the animal in a safe and a human way, teaching the others the same techniques, and performing the whole clinical examination. The student is ready to give his/her opinion of the other additional diagnostic examinations which are to be done on the surgical patient. In postoperative period a student can determine the way of treatment (pain control, treatment with antibiotics, physical therapy and other was of treatment). By this programme a student acquires knowledge of performing the surgical and anaesthesiologic protocol and taking records in the book of a patient in a way understandable to his/her profession and the public. He/she is well educated to apply correctly the principles of sterilization of surgical equipment and principles of aseptic surgery. The student is capable to apply safely the sedimentation, local and general anaesthesia and to estimate and control the pain. He/she is ready to recognise states indicating appropriateness of euthanasia and make it in a human way understanding the emotional state of the owner. The student can apply techniques of first aid giving in case of bleeding, wounds, burns or congelations. The techniques involve workup and wrapping of wounds, immobilisation and arresting bleeding. He/she can conservatively and surgically workup small wounds. He/she is acquainted with basic techniques of stitching of organs and tissues and with the choice of stitching materials.</p> <p>25 points (first exercises – thematic – participation is not evaluated, second exercises –thematic – participation is not evaluated, third exercises – 5 points max, fourth exercises -5 points max., fifth exercises – thematic –participation is not evaluated, sixth exercises – thematic –participation is not evaluated,</p>					

seventh exercises -5 points max., eighth exercises – 5 points max., ninth exercises -5 points max) = keeping records of anaesthesiologic protocols in an orderly manne.

25 points (first exercises – thematic – participation is not evaluated, second exercises –thematic – participation is not evaluated, third exercises – 5 points max, fourth exercises -5 points max., fifth exercises – thematic –participation is not evaluated, sixth exercises – thematic –participation is not evaluated, seventh exercises -5 points max., eighth exercises – 14 points max., ninth exercises -5 points max) = active participation in the work with patients

The number of points students must gain in order to earn minimal 5 points is 37,5. Participation of students at exercises will be checked continuously. During the semester, the continuous knowledge checking will be performed in oral form. The very checking will not be announced in front and shall be performed during the excersise hours. Iti s expected that students attent excersises prepared for the topic of excersise. Each student will be asked 6 questions, on which they can achieve 0 – 4 points per each question. The writen materials will be provided to students as mandatory literature for students of the subject : „ Surgery, orthopaedics and ophtalmology I „-

The continuous knowledge checking will beperformed in formo f 3 entireties:

The surgical asepsis and surgical instruments (4. and 5. chapters of the textbook „ The veterinary surgery and anaesthesiology“ edited by Maticić & Vnuk , in further text „Textbook“)

The stitching materials and basic techniques of stitching of organs and tissues (the 6. and 7. chapter of the „Textbook“)

And finally the bondages, compresses and drainage and infection of surgical patients, containing antimicrobe prophylaxis (chapter 8. and 18. of the „Textbook“)

Within this element of valuation it is possible to obtain maximum 32 points, (24 points x coefficiant 1.3333)

The minimum amount of the points for the student that wants to gain the right to complete the cours of studies of „Surgery, orthopaedics and ophtalmology I“ is 20 points (15 points x coefficient 1,3333).

Each student collect the points answering on the questions that are asked from the theaching person during the excersises time. There is not possible option of correcting or compensating those points.

In the case that student has not accomplished the minimal number of points during the semester, loses the right on the signature of the course advisor that verifies hers/his apprenticeship of the course: „Surgery, orthopaedics and ophtalmology I“. that means that student can not participate in the preliminar exam.

If the student has been absent from the oral continuous knowledge checking during the semester, this person can be orally examined only with the justified cause.

Before the final exam students will have chance to make up for exercises and the make up preliminary exam in case of their excused absence.

Minimal conditions for passing the first, second, third and forth evaluation element are summed up and they are worth 36 points all together.

The final exam starts with a student’s short analysis of results gained from the first four types of activities of attending lecture.

Questions in the final exam will be put in a way that a student can answer in written and oral form. In the written form there will be 5 questions, 3 of which must be answered correctly in order to take the oral exam (Student has to gain minimal 12 points). The maximum number of points that can be gained at the final exam is 40 points, where 4 points = 1 correct answer. The student must show at least a sufficient knowledge at the final exam, with no regard to gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 12 (12 points minimal at written as well at oral exam). In case a student does not satisfy at the final part of the exam, the lecturer determines time for re-examination.

	<p>Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements, according the following table:</p> <p>The final grade from a course programme is expressed in quantity, by a numeric point-system value and by a grade adequate to its value in points, from 1 to 5. Student is marked by grade 1 in case she/he did not master the programme course successfully, in other words grade 1 means insufficient standing.</p>		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	1. Theresa Fossum - Small Animal Surgery (2018.)		
	2. Jorg A. Auer; John A. Stick – Equine Surgery (2018.)		
	3. Ames N.K. – Noordsy's Food Animal Surgery (2014.)		
	4. Grimm K.A., et al – Veterinary Anesthesia and Analgesia (2015.)		
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY II

1. GENERAL INFORMATION			
1.1. Course teacher	Boris Pirkić, Full Professor, PhD, DMV	1.6. Year of the study programme	4
1.2. Name of the course	Surgery, Orthopaedics and Ophthalmology II	1.7. Credits (ECTS)	5,5
1.3. Associate teachers	Dražen Matičić, Full Professor, PhD, DMV, Berislav Radišić Full Professor, PhD, DMV Dražen Vnuk, Full Professor, PhD, DMV Mario Kreszinger, Assoc., Professor, PhD, DMV Tomislav Babić, Assoc. Professor, PhD, DMV Nika Brkljača Bottegaro – Assoc. Profwssor. PhD, DMV Ozren Smolec, Assoc. Professor, PhD, DMV Mako Pećin, Assoc. Professor, PhD, DMV Andija Musulin, Assoc. Professor, PhD, DMV	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+0+45
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Objective is to introduce the student with the basic knowledge in ophthalmology, abdominal and thoracic surgery, and oncology of domestic animals.		
2.2. Course enrolment requirements and entry competences required for the course	Upon gaining of provided skills and knowledge a student is capable of recognising particular diseases of head and neck in small and large animals (dehornisation in bovine) and starting the basic treatment. The student is acquainted with the diseases of chest, bases of their treatment and stabilisation of the patient with the chest diseases as well as with indication for referring such patients to referral clinics. He/she is trained to recognise particular types of hernia and basis of their treatment. The student is acquainted with indications for castration in particular animal species, with the way of performing the castration and post castration complications. He/she can recognise diseases of digestive system and of urinary and sex organs in dogs and cats, undertake the stabilisation of the patient and estimate indication for its referring to a referral clinic. The student is acquainted with the basic laparotomy in ruminants and possibilities of treatment of diseases of digestive system. He/she can recognise diseases of abdomen in horses evident in colica, approach a team treatment of the colica, undertake the stabilisation of the patient and estimate indication for a surgical treatment and its referring to a referral clinic. A student is acquainted with basic postulates of surgical approach and techniques of treatment of oncologic patients, and with a necessity of multidiscipline consideration of treatment modality. Upon gaining of knowledge and skills the student will be able to recognise diseases of eye in small and large animals treated during the teaching lessons, to start the		

	treatment and treat them in emergency case, to estimate indication for a surgical treatment and for its referring to a referral clinic.					
2.3. Learning outcomes at the level of the programme to which the course contributes	In the 8 th semester students broaden their knowledge and skills gained in the previous semester in order to improve the quality of their competence.					
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Student will be able to:</p> <p>recognize certain diseases of head and neck of small and large animals, as well as undergo basic treatment</p> <p>recognize thoracic diseases and undergo basic treatment</p> <p>stabilize thoracic patient and point him to referral clinic</p> <p>recognize various types of hernias and decide the type of treatment</p> <p>recognize indications for castration in various animal species</p> <p>recognize the patient with alimentary and urogenital disease, type of treatment and indication for pointing him to referral clinic</p> <p>deciding the indication for laparotomy in ruminants</p> <p>recognize the abdominal disease in a horse, with colic pain as the cardinal symptom</p> <p>discuss the basic postulates of surgical diagnostics and treatment of oncologic patient</p> <p>recognize the eye diseases of small and large animals</p> <p>undergo basic treatment of eye disease, as well as emergency treatment, and pointing to referral clinic</p>					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures:</p> <p>Surgery of head and neck at large animals ((trepanation, dehornisation etc.)</p> <p>Surgery of head and neck at small animals</p> <p>Surgical diseases of chest</p> <p>Hernia</p> <p>Castrations</p> <p>Surgical treatment of diseases of digestive system in dogs and cats</p> <p>Surgical treatment of diseases of rectum and anus</p> <p>Surgical treatment of diseases of urinary and sex organs</p> <p>Surgical treatment of diseases of abdomen in ruminants</p> <p>Surgical treatment of colica in horses</p> <p>Surgical oncology</p> <p>Diseases of eyelids, conjunctiva and lacrimal apparatus</p> <p>Diseases of cornea</p> <p>Diseases of middle ocular coat and lens</p> <p>Glaucoma</p> <p>Diseases of retina, vitreous body, optic nerve and eye orbit</p> <p>Practical training:</p> <p>1. Examination of the eye</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is	Class attendance	0,99	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	1,76	Oral exam	2,2	(other)	

equal to the ECTS value of the course)	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>Participating actively at the exercises students can gain 75 points max., what brings them 10 points in final. Points for performing the following tasks: 25 points = keeping records in the book of a patient in an orderly manner 25 points = keeping records of anaesthesiologic protocols in an orderly manner 25 points = active participation in the work with patients</p> <p>The number of points students must gain in order to earn minimal 5 points is 37,5. Student's participation at the exercises will be checked continuously During the semester a student must attend 30 exercise hours (out of total 45 hours) in order to gain minimal 8 points during the semester. The maximal number of gained points from this evaluation element is 12.</p> <p>During the semester there will be three (3) preliminary exams organised at the time of exercises each containing eleven (11) problems or questions. Each correctly solved problem or correctly answered question is worth one (1) point. A student must gain the total of 21 points from preliminary exams (minimal 7 from each preliminary exam) in order to earn minimal 20 points. The maximal number of points a student can gain from this evaluation element is 32 points. A student who does not gain minimal 21 points during the semester from preliminary exam has a right to take a makeup preliminary exam covering the units from all programme exercises. The makeup preliminary exam will be organised upon completion of the teaching in the semester. The total number of points at the preliminary exam is 32 (1 point multiply with 0,9696). A student who passes the makeup preliminary exam with more than half of correct answers has a right to take the final exam.</p> <p>Before the final exam students will have chance to make up for exercises and the makeup preliminary exam in case of their excused absence.</p> <p>Minimal conditions for passing the first, second, third and fourth evaluation element are summed up and they are worth 36 points all together.</p> <p>The final exam starts with a student's short analysis of results gained from the first four types of activities of attending lecture. Questions in the final exam will be put in a way that a student can answer in written and oral form. In the written form there will be 5 questions, 4 of which must be answered correctly in order to take the oral exam. The maximum number of points that can be gained at the final exam is 40 points, where 4 points = 1 correct answer. The student must show at least a sufficient knowledge at the final exam, with no regard to gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 12 (12 points minimal at written as well as oral exam). In case a student does not satisfy at the final part of the exam, the lecturer determines time for re-examination.</p>					
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library		Availability via other media	
	Teaching materials available on Clinical web site				web	
2.12. Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> - Theresa Fossum - Small Animal Surgery (2018) - Jorg A. Auer, John A. Stick – Equine surgery (2018.) - Noordsy J. L.; Ames N.K. – Food animal surgery (2006.) - Slatter Douglas – Fundamentals of veterinary ophthalmology (2017.) 					
2.13. Quality assurance methods that ensure the acquisition of exit competences						
2.14. Other (as the proposer wishes to add)						

TOXICOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Andreja Prevendar Crnić, Ph.D., DVM	1.6. Year of the study programme	4 rd
1.2. Name of the course	Toxicology	1.7. Credits (ECTS)	3.5
1.3. Associate teachers	Prof. Emil Srebočan, Ph.D., DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	24+6+24
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	20
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 2 on-line instructions 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	With the knowledge gained at the Toxicology course students will be educated to recognise intoxication in particular animal, approach treating the intoxicated animal, assess the successfulness of treatment, and provide for other possible harmful effects caused by intoxication. Professional sampling and transport of samples for toxicological analysis. Evaluation of the results of chemical toxicological tests in the case of residues according to legislation.		
2.2. Course enrolment requirements and entry competences required for the course	Completed exams in Biochemistry, Physiology of domestic animals I and Physiology of domestic animals II; Pathophysiology I and Pathophysiology II; General veterinary pathology and Special veterinary pathology; Pharmacology.		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - recognize poisoning - undertake therapeutic measures - evaluate the success of the therapeutic measures - evaluate possible hazardous consequences produced by the poisoning 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - recognize poisoning - undertake therapeutic measures - evaluate the success of the therapeutic measures - evaluate possible hazardous consequences produced by the poisoning - professional sampling and transport of samples for toxicological analysis - evaluation of the results of chemical toxicological tests in the case of residues according to legislation 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 Introduction (technical terms, toxin effects mechanisms, intoxication diagnostics, procedure with intoxicated animal, antidotes, calculation in toxicology, taking and sending of samples to chemical-toxic lab test); 2 Pesticides (insecticides, rodenticides, limacides, herbicides, fungicides); 3 Metals (mercury, lead, copper, zinc, iron, arsenic, selenium, cadmium); 4 Industrial pollutants (cyanides and cyanogen plants, fluorine, PCB, dioxins, and other POPs); 5 Nitrogen compounds (urea, ammonia and ammonium salts, nitrates, nitrous compounds); 6 Mycotoxins (hepatotoxins, nephrotoxins, trichitecenes, estrogens, fumonisines); 7 Others (sodium chloride, ethylene glycol, grapes, chocolate); 8 Biological material sampling (taking and sending of samples to toxic lab); 9 Clinical toxicology (bite of poisonous snakes in animals); 10 Sting of hymenopterous insects in animals; 11 Sting or bite of ticks and spiders in animals 12 Nanotoxicology.		

2.6. Format of instruction:	X lectures X seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments X multimedia and the internet X laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments: -																	
2.8. Student responsibilities	Attending lectures, continuous assessment and final exam.																			
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.63	Research	-	Practical training															
	Experimental work	-	Report	-	Activity	0,35														
	Essay	-	Seminar essay		(other)	-														
	Tests	1.12	Oral exam	1.4	(other)	-														
	Written exam		Project	--	(other)	-														
2.10. Grading and evaluating student work in class and at the final exam	<p>Attending lectures 24 HOURS 3 – 6 points 1 double period is worth 0.5 point (1 period = 0,25 point) In order to gain minimal 3 points a student must attend 6 lectures out of 12</p> <p>Attending seminars 6 HOURS 4 – 6 points 1 seminar is worth 1 point In order to gain minimal 4 points a student must attend 4 seminars out of 6</p> <p>Attending exercises 24 HOURS 4 – 6 points 1 double period is worth 0.5 point (1 period = 0.25 point) In order to gain minimal 4 points a student must attend 8 exercises out of 12</p> <p>Participation at exercises 5 – 10 POINTS Participation at seminars will be evaluated during the presentation of seminar works with 2.5 – 5 points. Participation at exercises will be evaluated with short oral testa with 2.5- 5 points.</p> <p>Continuous knowledge checking 20 – 32 points 1st PRELIMINARY EXAM - 16 points max. 2nd PRELIMINARY EXAM - 16 points max. Checking of knowledge with preliminary exams will be held after completed thematic units at seminars and practically done at exercises.</p> <p>Final exam WRITTEN AND ORAL 24 – 40 POINTS In order to take the final exam a student must gain minimal 16 points from attending and participation at lectures, exercises and seminars, and minimal 20 points from continuous knowledge checking.</p> <p>Final evaluation points According to the sum of gained points and the following table:</p> <table border="1" data-bbox="475 1697 1316 1989"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>						Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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85-92	4 (B)																			
93-100	5 (A)																			

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	1. Gupta, R.C.: Veterinary Toxicology: Basic and Clinical Principles. Elsevier, 2018		Department
	2. http://www.ivis.org/library.asp , V. Baesley: Veterinary toxicology, 1999		web
	3. Osweiler, G.D.: Toxicology, Williams & Wilkins Philadelphia, Baltimor, 1996		Department
	4. PP presentations of lectures, exercises and laboratory work		LMS
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous knowledge checking		
2.14. Other (as the proposer wishes to add)			

LIST OF OBLIGATORY SUBJECTS – 5th STUDY YEAR

Obligatory Subjects – 5th study year

Diseases and Treatment of Dogs and Cats I

Equine Medicine

Field Service Clinics

Food Hygiene and Technology

Food Hygiene and Quality Control

Infectious Diseases of Domestic Animals

Obstetrics and Reproduction II

Surgery, Orthopaedics and Ophthalmology III

State Veterinary Medicine

Veterinary Epidemiology

Veterinary Legislation and Food Safety Control

DISEASES AND TREATMENT OF DOGS AND CATS I

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. prof. Hrvoje Capak	1.6. Year of the study programme	5th year
1.2. Name of the course	Diseases and Treatment of Dogs and Cats I	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	<p>Prof. Dražen Matičić, Prof. Boris Pirkić, Prof. Dražen Vnuk; Assist. Prof. Marko Pećin, Assist. Prof. Andrija Musulin, Petar Kostešić, PhD, Valentina Plichta, DVM, Mirta Vučković, DVM, Marija Mamić, DVM</p> <p>Assist. Prof. Jelena Šuran</p> <p>Assoc. Prof. Andreja Gudan Kurilj, Assoc. Prof. Marko Hohšteter, Assist. Prof. Ivan-Conrado Šoštarić - Zuckermann, Lidija Medven Zagradišnik, PhD, Doroteja Huber, PhD, Ivana Mihoković, DVM</p> <p>Prof. Damir Stanin, Assist. Prof. Zoran Vrbanac, DACVSMR, DECVSMR; Assoc. Prof. Zrinka Štritof, Assist. Prof. Josipa Habuš, Assist. Prof. Vladimir Stevanović, Matko Perharić, PhD</p> <p>Assoc. prof. Hrvoje Valpotić, Assist. Prof. Diana Brozić</p>	1.8. Type of instruction (number of hours L+S+E+ e-learning)	Exercises 45 hours
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	15-20
1.5. Status of the course	Obligatory elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	<p style="text-align: center;">SURGERY ORTHOPEDICS AND OPHTHALMOLOGY</p> <p>Students widen their ophthalmology knowledge and skills acquired in eighth semester. Practical exercises are focused at ocular examination (tonometry, biomicroscopy and fundoscopy), and also students can observe nasolacrimal</p>		

	<p>canal irrigation in dogs. Students start during exercise practical dentistry course. First, they repeat oral cavity anatomy and physiology. Afterward, they learn dentistry instruments and equipment and principles of dentistry diagnostic. They will be able to recognize which condition they can treat and which they have to send to referral clinic. Students will know and principles of periodontal diseases. After listening of this subject, students will know to determine and mark each tooth and to examine oral cavity. They must recognize and treat some diseases, primary cremor dentium, paradontosis and gingivitis. Principles of teeth extraction will be presented. Students had anesthesia in seventh semester, but they have also clinical cases where it is necessary to perform anesthesia to the end of study. In this subject, critical points of canine and feline anesthesia, preanesthetic exam of patients and anesthesia of emergency patient will be presented. Student will be ready to perform less complicated cases of anesthesia under supervision of teacher. Basic principles of fracture management and practical work with implants at plastic models of bone will be presented. Students will have basis to attend specialised osteosynthesis course in the future.</p> <p>INFECTIOUS DISEASES OF DOGS AND CATS</p> <p>Students will widen acquired knowledge about differential diagnosis and infectious disease treatment in dogs and cats. Students will also learn to perform objective diagnosis of infectious diseases by simple methods available at daily basis. Students will also learn about new drugs, registered for treatment of infectious diseases (immunomodulatory drugs and antiviral drugs) and general prophylaxis and immunoprophylaxis.</p> <p>PATHOLOGY</p> <p>The most often dermatological diseases and skin tumors will be presented to students and the importance of cytological an pathohistological diagnosis in final diagnosis will be focused as factor for determination of prognosis and therapeutic efficiency. Tumor and skin biopsy samples collecting will be repeated as important step to achieve diagnosis.</p> <p>RADIOLOGY (X-ray, Computed Tomography) AND ULTRASOUND</p> <p>Students will be able to recognize and describe the most often diagnosis of bones and joints, and thoracic and abdominal diseases using different diagnostic imaging modalities (radiography, basic CT and ultrasonography).</p> <p>CLINICAL PHARMACOLOGY</p> <p>Students will repeat acquired knowledge of pharmacology at clinical cases and it will be also add some chapters which were not sufficiently studied in colegium Pharmacology. The focus will be put on rational use of antibiotic and antiparasitic and correct drug use in cats.</p>
2.2.Course enrolment requirements and entry competences required for the course	Enrolled tenth semester
2.3.Learning outcomes at the level of the programme to which the course contributes	

<p>2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</p>	<ul style="list-style-type: none"> -to perform ocular examination and determine indication of nasolacrimal canal irrigation -to diagnose and treat specific diseases of oral cavity -to conduct less demanding anesthesia in dogs and cats -to recognize specific implants for osteosynthesis and to know indication for their use -to recognize specific histopathological samples of dermatological diseases and the most often tumors in dogs and cats - to perform objective diagnosis of infectious diseases by simple methods available at daily basis and to treat infectious diseases using of different drugs -individual approach to general prophylaxis and immunoprophylaxis -to recognize the most often diagnosis of bones and joints, and thoracic and abdominal cavity diseases using different diagnostic imaging modalities -to rational use antibiotics and antiparasitics and to use correctly drugs in cats -to evaluate nutritional status, food and feeding procedure and to correct meal during dietary management of specific disease
<p>2.5.Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>SURGERY ORTHOPEDICS AND OPHTHALMOLOGY (16 hours)</p> <p>1.Tonometry 2.Biomicroscopy and funduscopy 3. Nasolacrimal canals irrigation in small animals 4. Anatomy and physiology of oral cavity 5.Instruments and equipment for dentistry 6. Diagnostic in dentistry and interpretation of radiographs of oral cavity 7.Basic of periodontal diseases 8. Principles of teeth extraction 9.Special consideration about canine and feline anesthesia 10. Anesthesia of emergency patients 11. Principles of osteosynthesis- practical approach</p> <p>INFECTIOUS DISEASES OF DOGS AND CATS (6 hours)</p> <p>1.Infectious gastroenteritis of dogs and cats 2. Retroviral infections of dogs and cats (new therapy modalities) 3. Rapid diagnostic assay in dogs and cats 4. Immunomodulators and antiviral agents 5. General prophylaxis of infectious diseases 6. Immunoprophylaxis</p> <p>RADIOLOGY AND ULTRASOUND (6 hours)</p> <p>1.Fractures, arthrosis, elbow dysplasia, OCD, hip dysplasia, pattelar luxation and spondylosis deformans 2. Diaphragmatic hernia, pneumonia, mitral insuficiency, dilatative cardiomiopathy, hypertrophic cardiomiopathy in cats 3. Metastasis, pyometra, gravidity, hernia, ileus, urolithiasis, intraabdominal tumors</p> <p>PATHOLOGY (6 hours)</p> <p>1.Citology in dermatology 2. Definition of morphology of primary and secondary skin lesions 3. Patomorphology and patohistology of the most common dermatologic diseases: atopic dermatitis, bacterial, viral and parasitic dermatitis 4. Tumors definition and morphology (histopathologic examination, tumor grading and tumor margins) 5. The most common skin tumors (histiocytoma, mast cell tumor, lymphoma) 6. The mammary gland</p>

	<p>tumors (incidence, pathohistologic tumor classification and determination of malignancy grade)</p> <p>CLINICAL PHARMACOLOGY (5 hours)</p> <p>1.Treatment of staphylococcal dermatitis 2. Treatment of canine otitis externa 3. Antiparasitic drug in dogs- principles of use 4. Use of antibiotics in cats- the most common problems 5. Pharmacotherapy in cats (problems with NSAID use in cats, insecticides in cats- piretrins)</p> <p>CLINICAL NUTRITION OF DOGS AND CATS (6 hours)</p> <p>1.Evaluation of nutritional status (body condition, laboratory tests) 2.Food evaluation (quantity, different types) 3.Evaluation of feeding 4. Meal correction 5. Dietary management of special diseases 6. Basic principles of feeding in different age phases</p>						
2.6.Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:				
2.8.Student responsibilities	Class attendance, active participation in exercise, tests, written exam						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	18%	Research		Practical training		
	Experimental work		Report		Active participation in exercise	10%	
	Essay		Seminar essay		(other)		
	Tests	32%	Oral exam		(other)		
	Written exam	40%	Project		(other)		
2.10. Grading and evaluating student work in class and at the final exam	<p>Class attendance</p> <p>A student has to attend 28 hours of exercise (totally 45 hours) to collect minimal 11 points. The maximal value is 18 points, if a student attends to each exercise. A attendance of one hour of exercise brings 0,4 point (18/45). Attendance in exercise (minimally 28 hours) is criterium for collection of index signature.</p> <p>Active participation in exercise</p> <p>Active participation in exercise is continuously evaluated during 12 practical exercises with grades from 1 to 5. Maximal value is sum of grades during 12 exercises (12 x 5) 60 and for this maximal value student can collect 10 points. Student must collect minimally sum of 30 to collect 5 points. $10/60 = 0,1667$. Sum of grades must be multiplied with coefficient 0,1667 to calculate final score for active participation in exercise. Student which did not collect minimal sum of grades can not collect index signature and must attend next year subject gain.</p> <p>Tests</p> <p>Student can collect in continuous assesment maximal 32 points. Student must collect minimal 20 points to be able to attend final exam, but not to</p>						

	<p>collect index signature. The continuous assesment test is consisted of 32 questions. One correct answer is one point. Questions are from Pathology (8), Clinical pharmacology (8), Clinical nutrition (8) and Radiology and ultrasound (8). Time of continuous assesment test will be arranged with subject coordinators.</p> <p>Final exam</p> <p>The final exam can get maximally 40 points to student. A written form of exam is consisted of 40 questions (30 Surgery orthopedics and ophthalmology and 10 infectious disease). Each correct answer gets 1 points to student. Student must collect minimal 24 points or 60% of answers from one subject (18 from Surgery orthopedics and ophthalmology and 6 from infectious disease). In the case that student did not collect minimal value from one subject, student will attend next time only to exam from this subject.</p>		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availa bility via other media
	Tobias, K.M., S.A. Johnston, (2012): Veterinary surgery small animal. Elsevier, St.Louis.		
	McKelvey D., K.W.Hollingshead (2003): Veterinary anesthesia and analgesia. Mosby, St.Louis.		
	Greene, E. G. (2012): Infectious diseases of dog and cat, fourth edition, Elsevier inc., St Louis, Missouri.		
	Pibot, P., V.Biourge, D. Elliot (2006): Encyclopedia of Canine Clinical Nutrition. Aniwa SAS, France.		
	Case, L. P., D. P. Carey, D. A. Hirakawa, L. Daristotle (1995): Canine and Feline Nutrition (Second Edition). Mosby Inc., St. Louis.		
	Kealy K. J., H.McAllister, J.P.Graham (2011): Diagnostic radiology and ultrasonography of the dog and cat. Elsevier Saunders.		
	Nyland T.G., J.S.Mattoon (2002): Small animal diagnostic ultrasound. Saunders Elsevier.		
	Thrall D.E. (2013.): Textbook of Veterinary Diagnostic Radiology. Saunders. St. Louis, Missouri.		
	Cowell R.L., R.D.Tyler, J.H.Meinkoth, D.B. DeNicola (2008): Diagnostic Cytology and Hematology of the Dog and Cat / 3 rd ed., Elsevier Health Sciences.		
	Zachary J.F., M.D. McGavin (2011): Pathologic Basis of Veterinary Disease, Edition 3 Mosby .		
	Einstein R., R.S. Jones, A.Knifton, G.A. Starmer (1994): Principles of Veterinary Therapeutics. Lohman Scientific and Technical, Lohman Group UK Ltd.		
	Barragry T.B. (1994): Veterinary Drug Therapy, Lea & Febiger, Philadelphia.Tokyo.		
	Bonagura J.D. (2000): Kirk's Current Veterinary Therapy XIII Small Animal Practice W.B. Saunders		

	Comp., Philadelphia Tokyo.		
	Bonagura J.D. (2009): Kirk's Current Veterinary Therapy XIV Small Animal Practice, David C. Twedt DW.B. Saunders - Elsevier Comp., Philadelphia Tokyo.		
2.12.Optional literature (at the time of submission of study programme proposal)			
2.13.Quality assurance methods that ensure the acquisition of exit competences	Student evaluation		
2.14.Other (as the proposer wishes to add)			

EQUINE MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Iva Getz, PhD	1.6. Year of the study programme	5 th (X semester)
1.2. Name of the course	EQUINE MEDICINE	1.7. Credits (ECTS)	7
1.3. Associate teachers	Ljubo Barbić, Full Prof., Frane Božić, Full Prof., Juraj Grizelj, Full Prof., Mario Kreszinger, Full Prof., Tomislav Mašek, Full Prof., Boris Pirkić, Full Prof., Andreja Prevendar-Crnić, Full Prof., Nikica Prvanović-Babić, Full Prof., Berislav Radišić, Full Prof., Ivana Kiš, Assoc. Prof., Marko Hohšteter, Assoc. Prof., Nika Brkljača -Bottegaro, Aassist. Prof., Hrvoje Capak, Assist. Prof., Jelena Gotić, Assist. Prof., Darko Grden, Assist. Prof., Ivan Folnožić, Assist. Prof., Franjo Martinković, Assist. Prof., Vladimir Stevanović, Assist. Prof., Ivan-Conrado Šoštarić-Zuckermann, Assist. Prof., univ. mag. Branimir Škrilin, DVM, Matko Perharić. DVM, Ivan Butković, DVM, Dorotea Huber, DVM, Lidija Medven Zagradišnik, DVM Juraj Šavorić, DVM, Mirta Vučković, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	9+36+45
1.4. Study programme (undergraduate, graduate, integrated)	Integrated Undergraduate and Graduate University Study of Veterinary Medicine in English	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Subject is offered as elective in tenth semester involved in specialized education in track "Farm animals and horses". The content is presented to students mainly in the form of seminars and exercises and is supplementation to completed fundamental preclinical and general clinical education. Practical exercises are held on clinical patients and on the stud farms. Students are trained to diagnose and cure the most common problems and diseases in the horses. This course qualifies involved students with competent knowledge in the field of equine medicine.		

2.2. Course enrolment requirements and entry competences required for the course	
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>The course contributes to higher competences in the field of equine medicine, continuing education and extended program of integrated undergraduate and graduate board of reproduction and breeding management, internal disease, surgery, orthopaedics and ophthalmology with procedures of X-ray and ultrasound diagnosis, infectious diseases, equine veterinary pathology, nutrition and dietetics, clinical pharmacology and toxicology and parasitology. This course presents an important part in education of new generation of students and they will obtain knowledge and skills in equine medicine on a more elaborate level than so far.</p>
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>REPRODUCTION AND OBSTETRICS</p> <ol style="list-style-type: none"> 1. Monitoring of follicular dynamics in mares by ultrasound examination, hormonal examination and getting know with hormonal references during cycle of mare. Optimal time of mating and insemination in mare. Artificial insemination of mares with fresh, chilled diluted and frozen semen, different regimes (treatments) for applications of hormonal preparations (light and progestagen treatments, prostaglandins in oestrus cycle, use of GnRH, hCG) - advantages and disadvantages; Endometrium evaluation (cytology, bacteriology, biopsy). Swabbing technique and evaluation of cytological result, sending and analysing method followed by EU conditions, endoscopic examination of uterus. 2. Specifics of Andrology examination in stallions, special spermology, collection and evaluation of stallion semen. 3. Early ultrasound and laboratory diagnosis of pregnancy, monitoring of fetal development using Doppler, diagnostics and reduction of twins, diagnosis and monitoring of high-risk pregnancy; Irregularities in the structure of the sexual organs (congenital and acquired). Embryonic loss, abortions, twin pregnancy, endometritis and endometriosis, functional disorders of ovarian function and ovulation; 4. Vitality foal determination at birth (APGAR), intensive care of newborns, foal watch and nursing of orphaned foals, procedures and treatment of newborns with weak vitality, procedures and treatment of prematurely born foals, treatment of specific newborn; Retention of meconium, septicemia, diarrhea, neonatal isoerythrolysis and other. <p>INTERNAL DISEASES</p> <ol style="list-style-type: none"> 5. Students will expand their knowledge in gastrointestinal diseases (endoscopic approach, colics, colitis X, ulceration of the digestive tract), respiratory diseases. Diseases of cardiovascular system, diseases of blood and blood forming organs, urological diseases (urolithiasis), dermatological and neurological diseases. Special emphasis will be put on gastrointestinal endoscopy, diagnostic and therapeutical approach to equine colic, also tracheal aspirate-indications, techniques and interpretation and bronchoalveolar lavage technique will be explained. <p>SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY</p>

	<p>6. Students in practical work tend to be able to approach to injured horse and treatment of wounds in the field conditions. Also, student is acquired with sedation, general intravenous and local anaesthesia in the field conditions education in abdominal surgery obtain that students can routinely recognise colic discomfort, application of diagnostics methods (sonding, rectal examination, puncture of abdomen) and treatment of colics in the field conditions and also decision making for referral clinic treatment, if needed. It is essential that student know to determine which medication have to apply for pain suppression and gut protect injuries during colic discomfort. Students are able to perform postoperative nursing.</p> <p>7. In purpose of lameness diagnostics knowledge of surgical propedeutics, diagnostics, anaesthesia and special methods of lameness diagnostics (ultrasound, CT, MR, arthroscopy, tendoscopy and scintigraphy) are essential. Also, they have to master pathogenesis, diagnostics and treatment of soft tissues in limbs especially flexor tendons in sport horses. Additionally students will be acquired with pathology and therapy of joint diseases which includes osteochondrosis (OCD). Hoof diseases are the part of the equine medicine education its pathogenesis and treatment of the hoof corium.</p> <p>8. In ophthalmology course students will be acquired with the most common eye diseases and medications applied in treatment of eye diseases.</p> <p>9. In equine dentistry student will be acquired with equine oral physiology, performing prophylactic teeth correction in the field condition and treatment of basic pathological process in the oral cavity.</p> <p style="text-align: center;">INFECTIOUS DISEASES</p> <p>10. During the practical work students will learn how to obtain the most suitable clinical samples required for objective diagnostic procedures of infectious diseases of horses. Furthermore they will be provided with information about referral diagnostic methods and referral laboratories for particular infectious disease of the horses. The acquired knowledge will prepare students for correct interpretations of the diagnostics tests results and knowledge about general prophylaxis will give to them sustained knowledge for implementation of control measures in prevention of infectious diseases. Finishing the course students will be also able to make appropriate immunization schedules for horses.</p> <p style="text-align: center;">X-RAY AND ULTRASOUND</p> <p>11. During practical work students will be trained for independent radiography of the extremities in horses and setting radiographic diagnosis.</p> <p style="text-align: center;">PARASITOGY</p> <p>12. Students are introduced to the development, morphology and determination of internal parasites as an etiological factor in the development of clinical signs in the most common invasive diseases of horses. They are also trained to perform a parasitological examination and determine the most common horse parasites in which prevention and treatment are an integral part of animal health care. In those invasive diseases for which diagnosis is possible in a specialized laboratory, they are able to properly take the material after the</p>
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	<p>suspicion and deliver it to a specialized laboratory with all the necessary information.</p> <p>PATHOLOGY – SELECTED CHAPTERS</p> <p>13. Students will expand their knowledge of the horse necropsy technique and recognition of pathological changes in diseases that are relatively common in horses and foals.</p> <p>CLINICAL PHARMACOLOGY</p> <p>14. During the conservatorium students will be introduced to the typical diseases of this noble species of animals and the possibility of their treatment.</p> <p>CLINICAL TOXICOLOGY</p> <p>15. Students will be able to recognize poisoning, approach the treatment of poisoned animals, assess the success of treatment and to sample material for diagnostic tests in an appropriate manner, primarily for toxicological analysis.</p> <p>NUTRITION AND DIETETICS IN HORSES</p> <p>16. Introducing future veterinarians with feeding as an important factor in preventing the emergence of a significant number of diseases and as a possible additional therapy in the treatment of the sick horses.</p>
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>OBSTETRICS AND REPRODUCTION</p> <p>1. Breeding management of mares: Oestrus and its detection, Endocrinology of the equine oestrous cycle. Monitoring of follicular dynamic in the mare with ultrasound examination. Optimal timing of mating and insemination in mare. 2. Assessment of mare fertility,. Contagious equine metritis: Recommendations for disease prevention and control during the breeding season. Examination and swabbing mares and stallions for CEM 3. Assessment of stallion fertility and breeding activity. Collecting and evaluating stallion semen. 3. Artificial insemination in mares with diluted, chilled and frozen semen: timing and techniques. 4. Management of the postpartum mare 5. Gynaecological surgery in mares 6. Pregnancy diagnosis - early ultrasound examination and resolving problems during pregnancy 7. Infertility in mares: embryonic loss, twin pregnancy, endometritis and endometriosis, ovulation failures 8. Neonatal care 9. Foal illnesses.</p> <p>SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY</p> <p>1. The first aid approach to to equine trauma; 2. Application of sedation, general intravenous and local anaesthetics in field conditions; 3. Acute abdomen (approach to urgent equine colics discomfort); 4. Postoperative care and complications related to abdominal surgery; 5. Apply of flexion tests and diagnostics anaesthesia in purpose of lameness diagnostic: 6. The most common pathological process and treatment of distal parts of limbs (patology of equine hooves, phalanges, metacarpal/metatarsal phalangeal joints carpus, tarsus and knee joints: 7. Treatment of soft tissues: flexor tendons, ligaments, bursae; 8. The basic principles in treatment of palpebral and corneal injuries and inflammation of tunica media 9. The basic of equine dentistry and teeth correction.</p> <p>INTERNAL MEDICINE</p>

	<p>1. Gastrointestinal diseases (gastrointestinal endoscopy; diagnostic and therapeutic approach to equine colic, colitis X; gastric and duodenal ulcers in horses and foals). 2. Respiratory diseases (tracheal aspirate-indications, techniques and interpretation; bronchoalveolar lavage; obstructive pulmonary disease; exercise induced pulmonary hemorrhage; bronchodilators and corticosteroids in aerosol form; immunomodulators in respiratory diseases therapy). 3. Diseases of cardiovascular system (arrhythmias; congenital cardiac defects; valvular diseases; endocarditis; pericarditis). 4. Diseases of blood and blood forming organs (anemia; polycythemia; thrombocytopenia; hemostasis; vasculitis; lymphoproliferative and myeloproliferative diseases). 5. Urological diseases (urolithiasis). 6. Dermatological diseases. 7. Neurological diseases (painful back, vestibular syndrome).</p> <p>INFECTIOUS DISEASES</p> <p>1. Review of the incidence of infectious diseases of horses and making of differential diagnosis based on epizootiological data and clinical symptoms; 2. Procedures in of horse infectious diseases diagnostics – sampling of adequate diagnostic material for microbiological, molecular and immunological diagnostic methods; 3. Treatment of infectious diseases of the horses; 4. General prophylaxis of infectious diseases of the horses; 5. Immunoprophylaxis of infectious diseases of the horses - immunization schedules.</p> <p>X-RAY AND ULTRASOUND</p> <p>1.The procedures of X-ray and ultrasound diagnosis. Diagnosis of pathological conditions of the distal phalanx. 2. Diagnosis of navicular disease 3. Pathology of metacarpophalangeal joint and carpus 4. Pathology of metacarpophalangeal joint and tarsus 5. Pathological condition of stifle 6. Chronic obstructive pulmonary disease (heaves) and pneumonia;</p> <p>PARASITOGY</p> <p>1.The common parasites of GI tract – coprological examination, dehelmentization and treatment 2. Samples shipment and laboratory diagnosis 3. Dehelmentization schedule of foals and young horses 4. Dehelmentization schedule of adult horses</p> <p>PATHOLOGY – SELECTED CHAPTERS</p> <p>1. Incidence of diseases and causes of death in horses, specifics of dissection of horses; 2. Pathomorphological changes in disorders of the stomach and intestines position in horses; 4. Pathomorphological changes in metabolic diseases of horses.</p> <p>CLINICAL PHARMACOLOGY</p> <p>1.Treatment of colic in horses (spasmolytics, nonsteroidal anti-inflammatory drugs) 2. Pharmacoterapeutic basics: prevention and treatment of laminitis (aseptic inflammation of the hoof dermis) 3. Prevention and treatment of chronic obstructive pulmonary disease of horses (anti-inflammatory drugs, bronchodilators).</p> <p>CLINICAL TOXICOLOGY</p>
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	<p>1. Clinical cases of pesticide poisoning in horses (case study) 2. Clinical cases of poisoning horses with herbs 3. Clinical cases of hymenoptera stings and snake bites.</p> <p>NUTRITION AND DIETETICS IN HORSES</p> <p>1. Dietetics in horses 2. Feeding in the prevention of disease 3. Therapeutic feeding.</p>					
2.6. Format of instruction:	X lectures X seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning X field work	X independent assignments X multimedia and the internet X laboratory X work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Students are obliged to participate lectures, seminars and exercise.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	1.26	Research		Practical training	
	Experimental work		Report		activity (other)	0.7
	Essay		Seminar essay		(other)	
	Test	2.24	Oral		(other)	
	Written exam	2.8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	All forms of instruction are obligatory to students. The students are evaluated according to activity and written and presented seminars. Course will be finished with written exam.					
	Activity					
		3 signatures (check list)		1 field exercise		1 answer
		4 signatures (check list)		1 field exercise		1 answer
		4 signatures (check list)		2 field exercises		1 answer
		5 signatures (check list)		2 field exercises		1 answer
5 signatures (check list)		2 field exercises				

		2 answers		10	
		6 signatures (check list) 2 field exercises 2 answers			
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media		
	The Merck Veterinary Manual		http://www.merckvetmanual.com/mvman/index.jsp		
	Noakes, D. E., T. J. Parkinson and G. C. W. England (2009): Veterinary reproduction & obstetrics, 9th edition. W. B. Saunders Company Ltd.	3			
	Gordon, I. (1996): Controlled reproduction in Horses. CAB International, University Press, Cambridge.	2			
	McKinnon, A. and J. L. Voss (1992): Equine reproduction. Lea & Febiger, Philadelphia.	2			
	Lumb and Jones (1996.): Veterinary anesthesia, 3rd ed., Williams and Wilkins, Baltimore.	2			
	Auer, J. A, Stick J. A. (1999): Equine surgery, W. B. Saunders company, 2nd ed. Philadelphia, London, Toronto, Montreal, Sydney, Tokyo	2			

	Ross M. W., Dyson S. J.(2003): Diagnosis and management of lameness in the horse, Saunders company, Philadelphia.	2	
	Radostits, O.M., C.C. Gay, D. C. Blood, K. W. Hinchcliff: Veterinary Medicine, A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses, 9th edition, W. B. Saunders, 2000.	3	
	Sellon, D., M. Long: Equine infectious diseases. W. B. Saunders 2007.	2	
	Reef, Virginia (1998): Equine diagnostic ultrasound. W. B. Saunders company.	3	
	Osweiler, G. D.: Toxicology, Williams & Wilkins Philadelphia, Baltimor, 1996.	2	http://www.ivis.org/library.asp
2.12. Optional literature (at the time of submission of study programme proposal)	<p>MAKEK, Z., I. GETZ, N. PRVANOVIĆ, A. TOMAŠKOVIĆ, J. GRIZELJ (2009). Rasplodivanje konja. Veterinarski fakultet, Zagreb.</p> <p>CERGOLJ, M., M. SAMARDŽIJA (2006): Veterinarska andrologija. Veterinarski fakultet Sveučilišta u Zagrebu.</p> <p>MATIČIĆ, Ž, CAPAK D. (1999.): Oftalmologija domaćih životinja, Veterinarski fakultet, Zagreb</p> <p>CAPAK, D., D. MATIČIĆ (2002): Veterinarska kirurška onkologija. U: Veterinarska onkologija. Ur. Željko Grabarević. DSK-FALCO, Zagreb.</p> <p>SLAVKO CVETNIĆ: Opća epizootologija. Školska knjiga – Zagreb, 1993.</p> <p>SLAVKO CVETNIĆ: Virusne bolesti životinja. Školska knjiga – Zagreb, 1997.</p> <p>SLAVKO CVETNIĆ: Bakterijske i gljivične bolesti životinja. Medicinska naklada – Zagreb, 2002.</p> <p>ŠEHIĆ, M.(2000): Osteoartropatije u domaćih životinja. Skaner studio Zagreb.</p>		

	<p>M. DONALD MCGAVIN, JAMES F. ZACHARY: Specijalna veterinarska patologija. Prema četvrtom američkom izdanju. Urednik hrvatskog izdanja: Željko Grabarević. Stanek d.o.o., Varaždin, 2008.</p> <p>RUŽA SABOČANEC, KRIŽAN ČULJAK: Osnove obdukcijske tehnike životinja. Zagreb, 1995.</p>
2.13. Quality assurance methods that ensure the acquisition of exit competences	<p>Students will be monitored during complete education process. During their practical training they have check list of obligatory procedures. They have obligatory seminars, test and final written exam.</p>
2.14. Other (as the proposer wishes to add)-	

FIELD SERVICE CLINICS

1. GENERAL INFORMATION			
1.1. Course teacher	Full prof. Nikica Prvanović Babić, PhD, DVM	1.6. Year of the study programme	5 th
1.2. Name of the course	Field Service Clinics	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	Multidisciplinary and case oriented nature of this subject would include variable team of clinical veterinary surgeons, depending of case load. Clinical surgeons would involve all teaching staff from Clinic for obstetrics and reproduction, Clinic for internal diseases, Clinic for surgery, orthopaedics and ophthalmology and Department for microbiology and infectious diseases with clinics. In absence of full prof. Prvanović Babić, PhD, DVM course leader as her replacement would be asst. prof. Darko Grden, PhD, DVM.	1.8. Type of instruction (number of hours L + S + E + e-learning)	0+0+60+0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	In addition to the general objectives and tasks of educating future veterinary surgeons, a special objective within this course to enable students to do professional work in the diagnosis, curing and prevention of animal diseases in the field.		
2.2. Course enrolment requirements and entry competences required for the course	Attended all cases I - IX. semester		
2.3. Learning outcomes at the level of the programme to which the course contributes	Acquiring the skills needed to perform the independent veterinary practices in the field condition.		

2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Independently perform all diagnostic procedures including methods of clinical examination in conditions of field work. Taking samples from the live patients or cadavers which would enable material for all types of laboratory tests. Perform all obstetrical procedures that can be performed well in the conditions of fieldwork and routine gynecological and andrological exams for all aspects of clinical reproductive practice. Perform all surgical procedures adapted to conditions of fieldwork and thorough clinical examination of all kinds of internal diseases on farm.			
2.5.Course content broken down in detail by weekly class schedule (syllabus)		Lecturers	content	methodological units
		Full prof.. Nikica Prvanović Babić, PhD, DVM Asst. prof. Darko Grden, PhD, DVM		Introductory lecture - clinical lecture
		Teachers and assistants from Item:		Veterinary practices and farms in areas:
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	STRUŽEC
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	BJELOVAR
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	JASTREBARSKO
		Internal surgery obstetrics	Performing practical training on patients under field conditions	RAKOVEC

	Infectious diseases		
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KARLOVAC
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KRIŽ
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ČAZMA
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	OZALJ
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	STRUŽEC
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ROVIŠĆE
	Internal surgery obstetrics	Performing practical training on patients under field conditions	JASTREBARSKO

	Infectious diseases		
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	LONJICA
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KARLOVAC
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KRIŽ
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ČAZMA
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	OZALJ
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	STRUŽEC
	Internal surgery obstetrics	Performing practical training on patients under field conditions	BJELOVAR

		Infectious diseases		
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	JASTREBARSKO
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	GRADEČ
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KARLOVAC
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KRIŽ
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ČAZMA
		Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	OZALJ
		Internal surgery obstetrics	Performing practical training on patients under field conditions	STRUŽEC

	Infectious diseases		
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ROVIŠĆE
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	JASTREBARSKO
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	VRBOVEČKA DUBRAVA
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KARLOVAC
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	KRIŽ
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	ČAZMA
	Internal surgery obstetrics Infectious diseases	Performing practical training on patients under field conditions	OZALJ

	Internal surgery obstetrics Infectious diseases		Performing practical training on patients under field conditions			STRUŽEC
	Internal surgery obstetrics Infectious diseases		Performing practical training on patients under field conditions			BJELOVAR
	Internal surgery obstetrics Infectious diseases		Performing practical training on patients under field conditions			JASTREBARSKO
2.6.Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input type="checkbox"/> x independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities	Keeping high biosecurity and animal welfare standards according to previous knowledge from clinical subjects and according to strict instructions from course leaders					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,63	Research		Practical training	
	Experimental work		Report		Activity	0,35
	Essay		Seminar essay		(other)	
	Tests	1,12	Oral exam	1,4	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	descriptive assessment					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	

	Complete obligatory literature for all clinical subjects i.e. Reproduction of domestic animals, internal diseases of domestic animals , surgery, orthopedics and ophtalmology of domestic animals and infectious deseases of domestic animals (please see course description for each subject)		
2.12.Optional literature (at the time of submission of study programme proposal)	Complete additional literature for all clinical subjects i.e. reproduction of domestic animals, internal diseases of domestic animals , surgery, orthopedics and ophtalmology of domestic animals and infectious deseases of domestic animals (please see course description for each subject)		
2.13.Quality assurance methods that ensure the acquisition of exit competences	All students would be evaluated for each case. Complete case load would be documented in student notebook, that needs to be presented any time during field work and after it, when requested. All data in student notebook should be verified and signed by clinical teacher responsible for that specific case and practical work.		
2.14.Other (as the proposer wishes to add)			

FOOD HYGIENE AND TECHNOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	assoc. prof. Nevijo Zdolec, PhD	1.6. Year of the study programme	5th year, IX. and X. semester
1.2. Name of the course	Food Hygiene and Technology	1.7. Credits (ECTS)	12.5
1.3. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, assoc. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	60+105+0
1.4. Study programme (undergraduate, graduate, integrated)	intergrated	1.9. Expected enrolment in the course	
1.5. Status of the course	obligatory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	In addition to the general aim and tasks, the education of future doctors of veterinary medicine has a special aim. It is the task of lecturers to teach the students how to perform independently all expert activities, and to apply the scientifically verified standards of hygiene and technology within the frameworks of the veterinary inspection and evaluation of food safety and quality. Of course, this is possible only by means of education in the field of application of process methods (technology) in the production of food products of high quality and hygiene standards, all in the context of improvement of veterinary public health.		
2.2. Course enrolment requirements and entry competences required for the course	A condition for attending the course: attended and passed all courses in the first three years of study. Attended all courses from the fourth year of study and passed exams in the subject: Internal Medicine (VII semester) and Game management and breeding (VII semester).		
2.3. Learning outcomes at the level of the programme to which the course contributes	Course Food Hygiene and Technology is an important segment of veterinary public health, which allows students to engage with the acquired knowledge in tasks and activities of veterinarians in the area of food inspection, official controls and systematic monitoring of the safety of food of animal origin. Students are trained to carry out veterinary inspections and controls of food, from its production, processing and transport.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	By the completion of the course students should be able to: <ul style="list-style-type: none"> - explain the structure, purpose and methods of veterinary inspection, control and monitoring of production, processing and distribution of food of animal origin - identify hazards and risks in the production and distribution of food of animal origin - interpret the results of food quality assessment and food safety - distinguish the type of food according to the production process - define acceptability factors of food for human consumption - incorporate legislation in the preparation and analysis reports in the field of hygiene and technology of food of animal origin 		

	<p>- evaluate production hygiene procedures in the facility and process control indicators</p>
<p>2.5.Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>Lectures: 1. Introduction; Food hygiene and veterinary public health. 2. Slaughter processing. 3. Animal welfare in slaughterhouses. 4. Meat biochemistry and meat conditions. 5. Risk based meat inspection (MSAS). 6. Biological hazards - foodborne microorganisms and parasites. Alimentary infections and intoxications. 7. Biological hazards – sampling and analyses, standards, assessment. 8. Chemical-toxicological hazards in food chain. 9. Chemical-toxicological hazards in food chain – sampling and analyses, standards, assessment. 10. Prerequisite programmes. 11. HACCP. 12. Official controls. 13. Meat quality and meat preservation. 14. Additives. 15. Carcass grading and meat processing. 16. Thermally processed meat products. 17. Thermally non-processed meat products. 18. Food fraud. 19. Milk and dairy products (trends in milk production, udder health, milking, legislation, controls). 20. Veterinary controls in milk production (hygiene, dairy microbiology and zoonoses, mastitis, quality and health requirements). 21. Chemical composition of milk (sensory and physico-chemical properties of milk, types of milk, nutritional value of milk and dairy products). 22. Hygiene and technology of production of dairy products (transport, processing). Heat treatment and microbiological risks. 23. Hygiene and technology of production of dairy products (fermented dairy products, condensed milk and milk powder, cream, butter). 24. Quality of dairy products. Packing material and packing of milk and dairy products. Additives. 25. Hygiene and technology of cheese production. HACCP in milk production. 26. Veterinary inspection of fish (quality and freshness assesment of fish, crabs and shellfish. Stunning of fish. Parasitic invasion in fish. Patogenic microorganisms. 27. Composition and quality of fish, crabs and shellfish (Structure and composition of fish. Classification and categorisation of fish, crabs and shellfish. <i>Post mortem</i> changes and fish spoilage. Bloogenic amines and bio toxins in fish. 28. Hygiene and technology of production of fish products (Processing and veterinary-sanitary inspection in fish and fish product trade. Hygienic and technological standards of production and evaluation of quality of fish products). 29. Eggs (Hygiene and technology of egg production and processing). Honey (Production and quality of honey). 30. Other foodstuffs of animal origin and future food safety guidelines.</p> <p>Exercises: - Transport to slaughter, Ante mortem examination, welfare in slaughterhouse, slaughterhouse constructing and equipment, slaughter processing, - Meat inspection, Animal waste in slaughterhouse - Food sampling; Sensorial analysis - Water holding capacity, Meat pigments - Meat freshness assessment - Microbiological examination of food. Interpretation of results. Microbiological cleanliness of surfaces. - Determination of pork fat quality - Antimicrobial resistance of food bacteria</p>

	<ul style="list-style-type: none"> - Additives and spices. Sensorial, chemical and microbiological analysis of meat products - Milk freshness and fat content - Density of milk. Milk adulteration - Hygienic quality of milk - Sensorial, chemical and microbiological analysis of dairy products - Eggs - Fish and fish products - HACCP - Microbiological standards - Field work at pig, cattle and poultry slaughterhouse - Field work at meat, milk and egg processing facilities 				
2.6.Format of instruction:	x lectures <input type="checkbox"/> seminars and workshops x exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning x field work		x independent assignments <input type="checkbox"/> multimedia and the internet x laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:
2.8.Student responsibilities	Students are required to attend all forms of teaching the subject.				
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	2.25	Research		Practical training
	Experimental work		Report		Activity 1.25
	Essay		Seminar essay		(other)
	Tests	4	Oral exam	5	(other)
	Written exam		Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	ACTIVITIES	MINIMAL SCORE		MAXIMAL SCORE	
	Lecture attendance	3		6	
	60 hours of lectures (coefficient: 0,1)	Student must attend 30 hours of lectures in order to gain 3 points		60 x 0,1 = 6 points	
	Exercise attendance	8		12	
	105 hours of exercises (coefficient: 0,114)	student must attend 72 hours of exercises in order to gain 8 points		105 x 0,114 = 12 points	
	Activity at exercises	5		10	
	Oral questions (2,5 points each)	2 answers (1 per semester) in order to gain 5 points		4 answers x 2,5 = 10 points	

	Continuous knowledge checking	20	32
	<p>2 preliminary written exams, 8 questions each.</p> <p>1 question = 2 points</p> <p>16 questions x 2 = 32 points</p> <p>The student must attend the first organized term of the test. In case of justified absence (medical proof), the student can access the remedial test.</p> <p>The first preliminary test (end of the IX sem) covers teaching units referring to veterinary control in meat production (4 questions) and lab excersises (4 questions). The second preliminary test (X sem) covers veterinary inspection, control and examination of milk, fish, eggs, honey and other foodstuffs and technological processing in production of milk, fish, eggs, honey and other</p>	<p>A student must give correct answers to 10 questions in order to gain 20 points</p>	<p>16 correct answers x 2 = 32 points</p>

	foodstuff (4 questions) and lab excersises (4 questions).		
	Final exam	24	40
	Oral exam, 10 questions. 1 question = 4 points 10 questions x 4 = 40 points	A student must give correct answers to 6 questions in order to gain 24 points	10 correct answers x 4 = 40 points

2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availabi lity via other media
	Borda. D., A. I. Nicolau, P. Raspor (2018): Trends in Fish Processing Technologies. CRC Taylor & Francis, SAD		pdf
	Chandan, C.R., A. Kilara, N. P. Shah (2008): Dairy Processing & Quality Assurance. A John Wiley & Sons, Ltd., Publication, 2008		pdf
	D.S. Collins, R. J. Huey (2015): Gracey's Meat hygiene. 11th edition. A John Wiley & Sons, Ltd., Publication, 2015.	1	pdf
	G.C. Mead (2004): Poultry meat processing and quality. CRC Press. 2004.		pdf
	Ray, B., A. Bhunia (2014): Fundamental Food Microbiology. 5th edition. CRC Taylor & Francis, SAD	1	
	Sutherland J. P., A. H. Varnam, M. G. Evans (1986): A colour Atlas of FOOD QUALITY CONTROL. A Wolfe Science Book.	1	
	Zdolec, N. (2016): fermented Meat Products: Health Aspects. CRC Taylor & Francis, SAD	10	pdf

2.12.Optional literature (at the time of submission of study programme proposal)	<p>Ninios, N., J. Lunden, H. Korkeala, M. Fredriksson-Ahoma (2014): Meat inspection and control in the slaughterhouse. Wiley Blackwell.</p> <p>REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety</p> <p>REGULATION (EC) No 852/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the hygiene of foodstuffs</p>
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	REGULATION (EC) No 853/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down specific hygiene rules of food of animal origin REGULATION (EU) 2017/625 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products
2.13. Quality assurance methods that ensure the acquisition of exit competences	Assessment during exercises.
2.14. Other (as the proposer wishes to add)	

FOOD HYGIENE AND QUALITY CONTROL

1. GENERAL INFORMATION			
1.1. Course teacher	prof. Željka Cvrtila, PhD	1.6. Year of the study programme	5
1.2. Name of the course	Food Hygiene and Quality Control	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, ass. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	11+30+4
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory elective subject	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	To inform the students about the trends in chemistry, toxicology and analytics as constituents of veterinary control in the protection of foodstuff hygienic quality and health safety. By means of lectures, exercises and seminars the students should acquire skills for independent interpretation of the obtained results of chemical analysis and bioresidue findings for the purpose of food quality and health safety evaluation. Furthermore, the aim of the subject is to make the students familiar with the methods of determination and isolation of microorganisms causing food spoilage and poisoning (alimentary infections and intoxications).		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of orientation "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	In the frame of veterinary public health and food safety to accept techniques for control of the quality and safety of food hygiene and understand the application of laboratory results in the evaluation of food safety.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> -define quality of foodstuffs -to determine the chemical composition of food of animal origin -perform sensory and microbiological analysis of foods, and in terms of improving quality and hygienic -interpret the results of sensory, chemical and microbiological food ingredients searches -explain the meaning of spices and additives in processed foods -evaluate the safety of foods on the basis of the tests performed 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures 11 hours</p> <p>Foodstuff quality (Definition of quality. Quality parameters. Foodstuff quality control. Nutritional tables) – 2 hours; Chemical composition of meat, fish, milk, eggs and their changes in the course of processing – 2 hours Chemical analysis of foodstuffs – 2 hour Microbiological analysis of foodstuffs I part – 2 hours</p>		

	<p>Microbiological analysis of foodstuffs II part – 2 hours Health safety of foodstuffs (Hygienic quality, accuracy of chemical composition, accuracy of declaration).– 1 hour</p> <p>Exercises 30 hours Sampling and representative quality of samples in chemical analysis of foodstuffs – 1 hour Determination of total, connective-tissue and muscle proteins. Determination of water and fat in foodstuffs. Ash. – 4 hours Chemical analysis of foodstuffs – 4 hours Chemical analysis of foodstuffs – field exercises – 6 hours Screening methods in analysis of food – 3 hours Microbiological analysis of foodstuffs I - 3 hours Microbiological analysis of foodstuffs II -2 hours Microbiological analysis of foodstuffs III – 3 hours Microbiological analysis of foodstuffs IV – 1 hour Microbiological analysis of foodstuffs V – 1 hour Microbiological analysis of foodstuffs VI – 2 hour</p> <p>Seminars 4 hours Sensoric (organoleptic) properties of foodstuffs Additives and spices in meat processing</p>				
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:		
2.8.Student responsibilities	Students are required to attend all forms of teaching the subject.				
2.9.Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	0.63	Research		Practical training
	Experimental work		Report		Activities
	Essay		Seminar essay		(other)
	Tests	1.12	Oral exam		(other)
	Written exam	1.4	Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	KOEFICIJENT	MINIMAL NUMBER OF POINTS	MAXIMUM NUMBER OF POINTS	
	Attending lectures	0.55	3	6	
	The total of 11 lecture hours	6:11=0.55	3:0.55=5.45 (5) The student must attend 5 lecture hours in order to gain minimal 3 points Each particular lecture hour is summed as 0.55 point	The student must attend 11 lecture hours in order to gain	

				maximal 6 points
	Attending exercises	0.2	4	6
	Total of 30 exercise hours	6:30=0.2	4:0.2=20 (20) The student must attend 20 exercise hours in order to gain minimal 4 points Each particular exercise hour is summed as 0.2 point	
	Attending at seminars	1.5	4	6
	Total of 4 seminars hours	6:4=1.5	4:1.5=2.67 (3) The student must attend 3 seminars hours in order to gain minimal 4 points Each particular seminar hour is summed as 1.5 point	
	Activity at exercises and seminars		5	10
	Seminare prepared and held = 3 points Oral answers to exercises = 4 points (4x1) Oral answers to seminars= 3 points (3x1)		5:1=5 The student gain minimal 5 points (oral answers at exercises and seminars)	
	Continuous knowledge checking		20	32
		During the course, continuous knowledge will be evaluated by 1 preliminary written exams (8 questions; 4 questions – chemistry of food and 4 questions food microbiology). The minimal number of points a student must gain is 20 (5 questions). In case a student answers less than 5 questions correctly at a		

			preliminary exam, he/she must retake the preliminary.	
	Final exam		24	40
			The final exam comprises all results gained from attending lessons. The exam is written. At the exam a student answers 20 questions. One correct answer is worth 2 points. Minimal number of points is 24.	
	Final evaluation		60	100
			Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements, according the following table.	
		Points Grade		
		up to 59	1 (F)	
		60-68	2 (E)	
		69-76	2 (D)	
		77-84	3 (C)	
		85-92	4 (B)	
		93-100	5 (A)	
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Jeantet, R., T. Croguennec, P. Schuck, G.Brulé (2016): Handbook of Food Science and Technology 1 - Food Alteration and Food Quality. John Wiley & Sons, Inc., London, UK			
	Jeantet, R., T. Croguennec, P. Schuck, G.Brulé (2016): Handbook of Food Science and Technology			

	2 - Food Process Engineering and Packaging. John Wiley & Sons, Inc., London, UK		
	Belitz H.-D., W. Grosch, P. Schieberle (2009): Food Chemistry 4th revised and extended edition. Springer-Verlag, Berlin, DE.		
	FAO Food and Nutrition Paper No 14/9, FAO Roma, Manual of Food Quality Control.		
	AOAC (1990): Official methods of analysis of the AOAC, 1990. Izd. K. Helbrick, Arlington.		
	International Standard ISO Methods.		
2.12.Optional literature (at the time of submission of study programme proposal)	<p>James, C. S. (1995): Analytical chemistry of foods. Blackie Academic & Professional.</p> <p>Prevot, A., V. Fredette (1966): Manual for the Classification and Determination of the Anaerobic Bacteria. Montreal 1966.</p> <p>Stannard, C. J., S. B. Petitt and F. A. Skinner (1989): . Rapid microbiological Methods for Foods, Beverages and Pharmaceuticals. Blackwell scientific Publications. Oxford, London, Edinburgh, Boston, Melbourne. 1989.</p> <p>Nollet, L. M. L., F. Toldrá (2015): Handbook of Food Analysis – 3rd Edition Vol I. Taylor & Francis Group, Boca Raton, U.S.A.</p>		
2.13.Quality assurance methods that ensure the acquisition of exit competences			
2.14.Other (as the proposer wishes to add)			

INFECTIOUS DISEASES OF DOMESTIC ANIMALS

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Vladimir Stevanović	1.6. Year of the study programme	5 th
1.2. Name of the course	Infectious Diseases of Domestic Animals	1.7. Credits (ECTS)	13,5
1.3. Associate teachers	Full Prof. Zoran Milas; Full Prof. Nenad Turk; Assoc. Prof. Vilim Starešina; Full Prof. Ljubo Barbić; Assoc. Prof. Zrinka Štritof; Assoc. Prof. Suzana Hađina; Assist. Prof. Josipa Habuš; Assist. Prof. Vladimir Stevanović; Matko Perharić, PhD, DVM; Marija Cvetnić, DVM, Iva Zečević, DVM, Iva Benvin, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	75 0 + 105 + 0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	At least 50% of lectures and 67% of exercises
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Study of Infectious diseases of domestic animals includes perception of occurrence, spreading and eradication of infectious diseases, diagnostics and application of measures and procedures in prophylaxis of infectious diseases in order to eradicate them. Cognition on natural focus of infectious diseases, infection containers and causative agents of zoonoses are particularly important in animal health maintenance as well as for lives of stock breeders and veterinarians working with animals. Students are to gain practical knowledge on diagnostics of infectious diseases occurred at one or more animal species by epizootiological, clinical, microbiological, serological, pathalogoanatomical and therapeutic method, as well as by biological experiment. In that way attendants are enabled to be single-handed in practice and to comprehend all the procedures taken elsewhere as support in objective diagnostics. In case of infection it is important for a veterinarian to be competent in using the right procedure while taking the samples for diagnostics and to use the statutory prophylactic measures.		

2.2.Course enrolment requirements and entry competences required for the course	Attended and passed all courses from 1 st , 2 nd and 3 rd year of study; attended all courses from 4 th year of study																												
2.3.Learning outcomes at the level of the programme to which the course contributes	The course Infectious diseases of domestic animals will give understanding of infectious disease outbreaks, transmission and control, diagnostics and preventive and control measures. Emphasis will be given to natural focal infectious diseases, reservoirs and zoonotic pathogens in order to preserve animal health, as well as health of farmers and veterinarians. Students should acquire knowledge and practical skills in diagnostics of infectious diseases of animals only using epizootiological, clinical, microbiological, serological, pathological and therapeutic methods, as well as biological experiments.																												
2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful overcoming of course student will be able to: - recognize factors which are conditioning infection, spreading and completion of infectious disease - diagnose infectious disease or to declare suspicion to infection - select the most appropriate samples and sampling for objective diagnosis of infectious disease - understand and evaluate laboratory test results - select further procedure with infected animal/s - perform etiologic treatment - perform legislation measures for control/eradication of infectious disease - recommend and install control and prevention measures for infectious diseases which are not regulated by the law																												
2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>Course content</p> <p>IX semester</p> <table border="1" data-bbox="544 1341 1385 2045"> <thead> <tr> <th data-bbox="544 1341 647 1417">Hours</th> <th data-bbox="647 1341 1385 1417">Lecture topics</th> </tr> </thead> <tbody> <tr> <td data-bbox="544 1417 647 1451">2</td> <td data-bbox="647 1417 1385 1451">Introduction to epizootiology</td> </tr> <tr> <td data-bbox="544 1451 647 1512">2</td> <td data-bbox="647 1451 1385 1512">Infection, Macro-organism defence mechanisms, Development of active immunity</td> </tr> <tr> <td data-bbox="544 1512 647 1545">2</td> <td data-bbox="647 1512 1385 1545">Source of infection</td> </tr> <tr> <td data-bbox="544 1545 647 1606">2</td> <td data-bbox="647 1545 1385 1606">Routes for spread of infectious diseases, Port of entry for pathogens</td> </tr> <tr> <td data-bbox="544 1606 647 1639">2</td> <td data-bbox="647 1606 1385 1639">Susceptibility to infection</td> </tr> <tr> <td data-bbox="544 1639 647 1673">2</td> <td data-bbox="647 1639 1385 1673">Prevention of infectious diseases</td> </tr> <tr> <td data-bbox="544 1673 647 1706">2</td> <td data-bbox="647 1673 1385 1706">Immunoprophylaxis</td> </tr> <tr> <td data-bbox="544 1706 647 1767">2</td> <td data-bbox="647 1706 1385 1767">Classification of infectious diseases; Stages of an acute infectious disease</td> </tr> <tr> <td data-bbox="544 1767 647 1800">2</td> <td data-bbox="647 1767 1385 1800">Canine viral and bacterial gastroenteritides I</td> </tr> <tr> <td data-bbox="544 1800 647 1834">2</td> <td data-bbox="647 1800 1385 1834">Canine viral and bacterial gastroenteritides II</td> </tr> <tr> <td data-bbox="544 1834 647 1895">2</td> <td data-bbox="647 1834 1385 1895">Feline immunodeficiency virus infection, Feline leukaemia virus infection, Feline infectious peritonitis</td> </tr> <tr> <td data-bbox="544 1895 647 1955">2</td> <td data-bbox="647 1895 1385 1955">Feline parvovirus infection, Feline respiratory disease, Feline infectious anaemia</td> </tr> <tr> <td data-bbox="544 1955 647 2045">2</td> <td data-bbox="647 1955 1385 2045">Canine distemper, Infectious canine hepatitis, Canine infectious respiratory disease, Canine herpesvirus infection</td> </tr> </tbody> </table>	Hours	Lecture topics	2	Introduction to epizootiology	2	Infection, Macro-organism defence mechanisms, Development of active immunity	2	Source of infection	2	Routes for spread of infectious diseases, Port of entry for pathogens	2	Susceptibility to infection	2	Prevention of infectious diseases	2	Immunoprophylaxis	2	Classification of infectious diseases; Stages of an acute infectious disease	2	Canine viral and bacterial gastroenteritides I	2	Canine viral and bacterial gastroenteritides II	2	Feline immunodeficiency virus infection, Feline leukaemia virus infection, Feline infectious peritonitis	2	Feline parvovirus infection, Feline respiratory disease, Feline infectious anaemia	2	Canine distemper, Infectious canine hepatitis, Canine infectious respiratory disease, Canine herpesvirus infection
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	Exercises	
	Hours	Exercise topics
	3	Biosafety
	3	Pathogenesis and clinical manifestations of infectious diseases
	3	Clinical examination in infectious disease
	3	Diagnostics of infectious diseases – epizootiological and clinical methods
	3	Diagnostics of infectious diseases – Pathoanatomical diagnosis, experimental infections as diagnostic method and success of treatment as a diagnostic method
	3	Sampling and submission of laboratory samples
	3	Microbiological, immunological and molecular diagnostic methods I
	3	Microbiological, immunological and molecular diagnostic methods II
	3	Microbiological, immunological and molecular diagnostic methods III
	3	Microbiological, immunological and molecular diagnostic methods IV
	3	Microbiological, immunological and molecular diagnostic methods V
	3	Microbiological, immunological and molecular diagnostic methods VI
	3	Interpretation of serological test results
	3	Infectious diseases surveillance, Reporting of infectious disease
	3	Intensive care and treatment of patients with infectious diseases
	3	Antibiotic therapy
	3	Differential diagnosis of canine and feline infectious gastroenteritis
	3	Differential diagnosis of canine and feline respiratory infections
	3	Immunoprophylaxis of infectious disease in dogs and cats
	3	Vector-borne diseases
	X semester	
	Lectures	
	Hours	Lectures topics
	2	Equine infectious anaemia, African horse sickness
	2	Equine influenza, Equine viral arteritis; Equine viral rhinopneumonitis
	2	West Nile virus infection, Bovine viral diarrhoea – mucosal disease
2	Contagions equine metritis, Infectious abortion caused by Salmonella, Equine coital exanthema	

2	Strangles; <i>Rhodococcus equi</i> infection
2	Bovine enzootic bronchopneumonia (Crowding disease), Infectious bovine rinotracheitis, Malignant catarrhal fever, Infectious bovine keratoconjunctivitis (Pink eye)
2	Viral diarrhoea in calves, Winter dysentery, Lumpy skin disease
2	Enzootic bovine leucosis, Bovine spongiform encephalopathy
2	Classical swine fever, African swine fever
2	Swine erysipelas, Greasy pig disease, <i>Streptococcal and Staphylococcal</i> infections in swine
2	Swine dysentery, Transmissible gastroenteritis of swine, Colibacillosis in piglets, Edema disease
2	Enzootic pneumonia (Mycoplasmal pneumonia), Glässers disease, Pleuropneumonia in pigs
2	Porcine circovirus associated diseases, Porcine reproductive and respiratory syndrome, Inclusion body rhinitis, Progressive atrophic rhinitis
2	Caprine arthritis and encephalitis, Ovine pulmonary adenomatosis; Contagious ecthyma, Sheep and goat pox
2	Bluetongue, Foot rot in sheep, Caseous lymphadenitis
2	Rabies, Aujeszki disease
2	Anthrax, Tetanus, Botulism
2	Enterotoxemia, Black leg, Malignant edema
2	Tularemia, Listeriosis
2	Leptospirosis, Q-fever
2	Brucellosis, Melitococcosis
2	Tuberculosis, Paratuberculosis, Actinomycosis, Botryomycosis
2	Foot and mouth disease; Vesicular stomatitis
2	Ringworm, Warts (Papillomatosis), Eperythrozoonosis
2	Myxomatosis, Rabbit haemorrhagic disease, Pasteurellosis in rabbits
Exercises	
Hours	Exercises topics
3	Differential diagnosis in equine enteric infections and equine respiratory infections
3	Differential diagnosis in equine infectious abortion; Immunoprophylaxis of infectious disease in equine
3	Differential diagnosis in bovine infectious respiratory diseases; Immunoprophylaxis of infectious disease in bovine
	Differential diagnosis in bovine infectious abortion; Differential diagnosis in bovine enteric infections
3	Differential diagnosis of swine infectious abortion; Differential diagnosis in swine enteric infections
3	Differential diagnosis of infectious respiratory diseases of swine; Immunoprophylaxis of infectious disease of pigs

	3	Differential diagnosis of caprine and ovine infectious diseases
	3	Differential diagnosis in neurological infectious disease

2.6.Format of instruction:	x lectures <input type="checkbox"/> seminars and workshops x exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor x clinical exercises	2.7.Comments:

2.8.Student responsibilities	
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2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	2,43	Research		Practical training	
	Experimental work		Report		Class activities	1,35
	Essay		Seminar essay		(other)	
	Tests	4,32	Oral	5,4	(other)	
	Written exam		Project		(other)	

2.10. Grading and evaluating student work in class and at the final exam	<table border="1"> <thead> <tr> <th>TYPES OF ACTIVITIES</th> <th>MINIMAL NUMBER OF POINTS</th> <th>MAXIMAL NUMBER OF POINTS</th> </tr> </thead> <tbody> <tr> <td>Attending lectures</td> <td>4</td> <td>6</td> </tr> <tr> <td>(75 lecture hours)</td> <td>(coefficient 0.08) 4 : 0.08=50</td> <td>(coefficient 0.08) 6 : 0.08 = 75</td> </tr> <tr> <td></td> <td>(a student must attend 50 lecture hours in order to gain minimal 4 points)</td> <td></td> </tr> <tr> <td>Attending exercises</td> <td>4</td> <td>6</td> </tr> <tr> <td>(105 exercise hours)</td> <td>(coefficient 0.057) 4 : 0.057 = 70</td> <td>(coefficient 0.105) 6 : 0.057 = 105</td> </tr> <tr> <td></td> <td>(a student must attend 70 exercise hours in order to gain minimal 4 points)</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			TYPES OF ACTIVITIES	MINIMAL NUMBER OF POINTS	MAXIMAL NUMBER OF POINTS	Attending lectures	4	6	(75 lecture hours)	(coefficient 0.08) 4 : 0.08=50	(coefficient 0.08) 6 : 0.08 = 75		(a student must attend 50 lecture hours in order to gain minimal 4 points)		Attending exercises	4	6	(105 exercise hours)	(coefficient 0.057) 4 : 0.057 = 70	(coefficient 0.105) 6 : 0.057 = 105		(a student must attend 70 exercise hours in order to gain minimal 4 points)							
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	complete answer to a question at exercises = 1 point		
		A student must gain 8 points to earn minimal 8 points	
	Continuous knowledge checking	20	32
	1 oral preliminary exam each preliminary exam: 1 question = 0-4 points 8 questions = 32 points	(coefficient 1) 20 : 1 = 20	(coefficient 1) 32 : 1 = 32
		A student must gain minimal 20 points in order to earn minimal 24 points	
	Final exam	24	40
	Oral exam with 10 questions 1 question = 4 points 10 questions = 40 points	(coefficient 1) 24 : 1 = 24	(coefficient 1) 40 : 40 = 1
		(A student must gain minimal 24 points at the oral exam in order to earn minimal 24 points at final)	
	Total	60	100
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Sellon, D. C., M. T. Long (2014): Equine infectious diseases. 2 nd Ed., Elsevier Saunders, St. Louis, Missouri, SAD.	3	
	Green, C. (2012): Infectious diseases of dog and cat. 4 th edition. Saunders Elsevier	3	
	Constable P., K. W. Hinchcliff, S. Done, W. Gruenberg (2016): Veterinary Medicine, A Textbook of the Diseases of Cattle, Horses,	1	

	Sheep, Pigs and Goats, 11 th Ed., 2 Volume set, W. B. Saunders Ltd.		
	Aiello S. E., M. A. Moses (2016): The Merck Veterinary Manual. 11 th Ed. Wiley, Hoboken, New Jersey, SAD.	2	
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Hagan, W. A. and Bruner, D. W. (1998): Microbiology and Infectious Diseases of Domestic Animals. 8th ed., Comstock, Ithaca.</p> <p>Rolle, M. (2001): Mikrobiologie, Infektions- und Seuchenlehre. 7th Ed., Ferdinand Enke Verlag., Stuttgart.</p> <p>Naglić, T., D. Hajsig, J. Madić, L. Pinter (2005): Specijalna veterinarska bakteriologija i mikologija. Veterinarski fakultet Sveučilišta u Zagrebu i Hrvatsko mikrobiološko društvo, Zagreb.</p> <p>Hajsig, D., Lj. Pinter, T. Naglić, R. Antolović (2012): Veterinarska klinička imunologija. Sveučilišni udžbenik, Veterinarski fakultet Sveučilišta u Zagrebu i Hrvatsko mikrobiološko društvo, Zagreb.</p> <p>Pugh, D. G., N. Baird (2012): Sheep and Goat Medicine, 2nd Ed., Elsevier Saunders, St. Louis, Missouri, SAD.</p> <p>Sykes, J. E. (2013): Canine and feline infectious diseases, 1st Ed., Elsevier Saunders, St. Louis, Missouri, SAD.</p> <p>Cvetnić, Ž. (2013): Bakterijske i gljivične zoonoze. Medicinska naklada, Zagreb.</p> <p>Šeol Martinec, B., V. Herak Perković, urednice hrvatskog izdanja (2013): Veterinarska imunologija, Načela i primjena, prijevod: M. J. Day, R. D. Schultz: Veterinary Immunology: Principles and Practice, 1st. Ed. CRC Press, Taylor & Francis Group, 2010. Medicinska naklada, Zagreb.</p> <p>Cvetnić, S. (1993): Opća epizootiologija; Školska knjiga, Zagreb.</p> <p>Zaharija, I. (1980): Opća epizootiologija; Školska knjiga, Zagreb.</p> <p>Cvetnić, S. (1997): Virusne bolesti životinja; Školska knjiga, Zagreb.</p> <p>Cvetnić, S. (2002): Bakterijske i gljivične bolesti životinja, Medicinska naklada, Zagreb</p> <p>Zaharija, I. (1978): Zarazne bolesti domaćih životinja; Školska knjiga, Zagreb.</p> <p>Jukić, B. (2003): Tropske zarazne bolesti životinja; Veterinarski fakultet Sveučilišta u Zagrebu.</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

OBSTETRICS AND REPRODUCTION II

1. GENERAL INFORMATION			
1.1. Course teacher	Juraj Grizelj, Full Prof	1.6. Year of the study programme	5 (IX semester)
1.2. Name of the course	Obstetrics and Reproduction II	1.7. Credits (ECTS)	5.5
1.3. Associate teachers	Tomislav Dobranić, Full Prof, Marko Samardžija, Full Prof, Iva Getz, Assoc. Prof, Martina Lojkić; Assoc. Prof, Nikica Prvanović Babić Assoc. Prof, Silvijo Vince, Assoc. Prof, Ivan Folnožić, Assist. Prof, Branimira Špoljarić, Assist. Prof, Ivan Butković, DVM, Juraj Šavorić, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+0+45
1.4. Study programme (undergraduate, graduate, integrated)	Integrated Undergraduate and Graduate University Study of Veterinary Medicine in English	1.9. Expected enrolment in the course	25
1.5. Status of the course	Compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	Within the course framework, the students will get acquainted in detail with the pathology of pregnancy and parturition, with causes, clinical picture, diagnostics and therapeutic approach of infertility in domestic animals. Students will also be thoroughly familiarized with pathology of mammary gland in companion animals, principles of contraception, including pregnancy termination, causes, diagnosis and therapy of common diseases of the new-born animals and basic principles of assisted reproduction methods.		
2.2. Course enrolment requirements and entry competences required for the course	Students are required to have pending completion of the course of Obstetrics and Reproduction 1 as an enrolment requirement. As the entry competences they should be able to take the animal's gynaecologic history, perform a gynaecological clinical examination and recognize clinical signs of reproductive cycle, pregnancy, parturition and puerperium. Also to perform a clinical examination of the mammary gland and apply basic principles of clinical examination of males and laboratory semen tests.		
2.3. Learning outcomes at the level of the	-		

programme to which the course contributes							
2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>to explain the irregular ovarian function in domestic animals; to relate the impact of feeding and keeping animals on their reproduction; to use knowledge about inflammatory conditions of uterus and its diagnostics; to check parturient animal and define the pathology of parturition status, propose the proper obstetrical method and/or gynaecological surgery as a method of proper therapeutic approach. to diagnose congenital and acquired abnormalities of the reproductive organs that could cause infertility; to independently choose a method of assisting the difficult parturition; to understand the approach to pregnancy termination.</p>						
2.5.Course content broken down in detail by weekly class schedule (syllabus)	Obstetrics and treatment of dystocia in domestic animals, Infertility in bovine, Infertility in mares, Infertility in sheep and goats, Infertility in swine, Infertility in dogs and cats, Neoplasia of mammary glands, Contraception and pregnancy termination, Pseudopregnancy of bitches and queens, Fibroadenomatous hypertrophy of queens, Veterinary neonatology, Assisted reproduction in veterinary medicine.						
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:				
2.8.Student responsibilities	Students are obliged to attend at least 15 lecture hours and 30 hours of practicals. A minimum of 5 (max 10) points must be gained during practicals, which consists of the completion of a minimum of 3 (max 6) positively evaluated assignments imposed by teacher and based on active participation during practicals (signed off by the teacher), and 2 (max 4) positive answer on short oral exam.						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.99	Research		Practical training	0.55	
	Experimental work		Report		(other)		
	Essay		Seminar essay		(other)		
	Tests	1.7	Oral exam	2.2	(other)		
	Written exam		Project		(other)		
2.10. Grading and evaluating student work in class and at the final exam	<p>By attending lectures the student gains 3-6 points (30 lecture hours; each lecture hour equals 0.1 coefficient). Students must attend at least 15 lecture hours.</p> <p>By attending practicals the student gains 8-12 points (45 hours of practicals; each practicals hour equals 0.11 coefficient). Students must attend at least 30 hours of practicals.</p> <p>The activity at the practicals is evaluated with 5-10 points; the activity will be evaluated through short oral exams and practical assignments.</p> <p>There will be a progress test performed during the semester consisting of 10 questions and performed in written form. The progress test brings 32 points (each question equals 3.2 points), 20 points being the minimum</p>						

required to pass. Taking the progress test during the main term is compulsory (missing the main term needs to be justified).

3 additional progress test terms will be announced, as per agreement with students.

A passing grade for the progress test is a requirement in order to register for the final exam. However, the progress test is not a requirement for a signature in the grade book. If the student fails the progress test 4 times, he/she needs to take the whole course over again. In case he/she doesn't take the progress test or fails it 4 times, an additional term is possible if the student representative writes an official request to the respective Vice Dean. The Course leader makes the final decision.

In order to take the final exam, a student must gain a minimum of 16 points by attending lectures and practicals and through activities during practicals, and at least 20 points from continuous knowledge assessments.

The final exam consists of 10 oral questions and in total brings up to 40 points (a minimum of 24 points to pass). The total sum of points achieved from the above-mentioned elements is expressed in the final mark (1 – 5), 1 being a fail.

<i>Points</i>	<i>Grade</i>
up to 59	1 (F)
60-68	2 (E)
69-76	2 (D)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Noakes, D. E., T. J. Parkinson and G. C. W. England (2009): Veterinary Reproduction & Obstetrics, 9 th edition. W. B. Saunders Company Ltd.	1	-
	Gordon, I. (1997): Controlled Reproduction in Pigs. CAB International.	1	-
	Blanchard, T. L. et al., (2003): Manual of Equine Reproduction. Mosby.	1	-
	Simpson, G. (2008): BSAVA Manual of Small Animal Reproduction and Neonatology. British Small Animal Association. Gloucester	1	-
	Johnston, S. D., M. V. Root Kustritz, P. S. Olson (2001): Canine and Feline Theriogenology. Saunders	1	-

	Jackson, P. G. G. (2004): Handbook of Veterinary Obstetrics. Saunders W. B. Company.	1	-
	Jonston, Kustritz, Olson (2003): Canine and Feline Theriogenology. Saunders W. B. Company.	1	-
2.12.Optional literature (at the time of submission of study programme proposal)	BSAVA Manual of Canine and Feline Abdominal Surgery; Williams and Niles (eds.), BSAVA, 2005 Gary Landsberg, Wayne L. Hunthausen, Lowell J. Ackerman (2003): 5. Handbook of Behavioural Problems of the Dog and Cat, W. B. Saunders Company. McKinnon A. O. (1993): Equine Reproduction, Lea and Febiger. Samper J. C. (2000): Equine Breeding Management and Artificial Insemination. W. B. Saunders Company. The Merck Veterinary Manual 10 th edition (2010): Merck & CO. Hafez (1993): Reproduction in Farm Animals. Lea and Febiger. Pugh (2002): Sheep and Goat Medicine. W. B. Saunders Company. Smith and Sherman (2009): Goat Medicine. Wiley Blackwell. Solaiman (2010): Goat Science and Production. Wiley Blackwell. Paterson, B. (2001): Colour Atlas of Clinical Anatomy of the Dog and Cat, Mosby. Baker, L. (2000): Colour Atlas of Cytology of the Dog and Cat, Mosby		
2.13.Quality assurance methods that ensure the acquisition of exit competences	Regular classes' attendance-checking, continuous student activity assessment during the entire semester; continuous knowledge checking (progress tests), regular student consultation, students' questionnaire.		

SURGERY, ORTHOPAEDICS AND OPHTHALMOLOGY III

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Marko Pećin	1.6. Year of the study programme	5
1.2. Name of the course	Surgery, orthopaedics and ophthalmology III	1.7. Credits (ECTS)	5,5
1.3. Associate teachers	Dražen Matičić, Full Professor, PhD, DMV, Boris Pirkić, Full Professor, PhD, DMV, Berislav Radišić Full Professor, PhD, DMV, Dražen Vnuk, Full Professor, PhD, DMV, Mario Kreszinger, Full Professor, PhD, DMV, Tomislav Babić, Assoc. Professor, PhD, DMV, Ozren Smolec, Assoc. Professor, PhD, DMV Nika Brkljača Bottegaro – Assist. Professor. PhD, DMV, Marko Pećin, Assist. Professor, PhD, DMV, Andrija Musulin, Assist. Professor, PhD, DMV	1.8. Type of instruction (number of hours L + S + E + e-learning)	30+0+45
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The course goals are to introduce basics of small and large animal orthopaedics and basics of small animal neurosurgery in order to prepare students for diagnostic procedures and treatment.		
2.2. Course enrolment requirements and entry competences required for the course	Upon gaining of provided skills and knowledge a student is capable of recognising particular orthopaedics and neurological diseases of small animals and orthopaedics diseases of large animals with enrolment in treatment of toes and hooves diseases.		
2.3. Learning outcomes at the level of the programme to which the course contributes	In the 9 th semester students broaden their knowledge and skills gained in the 7 th and the 8 th semester in order to improve their competences.		

2.4.Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Student can recognise diseases of muscles, tendons and ligaments, and determine the basic treatment. The student is acquainted with the diseases of joints, basics of their treatment and indication for referring patients to a referral clinic. He/she is acquainted with diagnostics and basic ways of treatment the fractures in small animals. The student is trained to give the first aid to a patient, immobilize the fracture and recommend other options of treatment. The students are acquainted with the diagnostic and basic treatment of lameness, diseases of muscles, tendons and tendon sheaths in large animals. He/she is able to recognise paralyses and paresis in pets and large animals and estimate indication for referring patients to a referral clinic. The student is acquainted with diagnostics of hoof and toes diseases in large animals and is trained to treat simple cases and indicate possible need to refer the patient to a referral clinic. He/she is acquainted with the basics of hoof corrections, types of horseshoes and with the basic techniques of toes corrections. The student is trained to perform basic neurological examination, diagnostics of a fracture and luxation of vertebrae and estimate the indication for referring the patients to a referral clinic. The student is trained to diagnose diseases of intervertebral disc and degenerative diseases of vertebral column and is able to estimate indication for referring the patents to a referral clinic.</p>					
2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures:</p> <ol style="list-style-type: none"> 1.Orthopaedic examination of small animals 2.Diseases of muscles, tendons and ligaments 3.Diseases of joints 4.Treatment of bone fractures in small animals 5.Diagnostics of lameness in large animals 6.Diseases of muscles, tendons and tendon sheaths 7.Paralyses and paresis 8.Diseases of hooves 9.Diseases of toes 10.Types of horseshoes and correction of hooves 11.Correction of toes 12.Neurological examination 13.Fractures and luxation of vertebrae 14.Diseases of intervertebral disc 15. Degenerative diseases of vertebral column <p>Exercises:</p> <p>Practical training – small animal orthopaedic exam Practical training – small animal neurologic exam Practical training – large animal orthopaedic exam Practical training – correction of hooves Practical training – correction of toes</p>					
2.6.Format of instruction:	X lectures <input type="checkbox"/> seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities						
2.9.Screening student work	Class attendance	0,94	Research		Practical training	

<i>(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</i>	Experimental work		Report		activity	0,55
	Essay		Seminar essay		(other)	
	Tests	1,76	Oral	2,2	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>Participating actively at the exercises students can gain 75 points max., what brings them 10 points in final. Points for performing the following tasks:</p> <p>25 points = keeping records in the book of a patient in an orderly manner</p> <p>25 points = keeping records of anaesthesiology protocols in an orderly manner</p> <p>25 points = active participation i the work with patients</p> <p>The number of points students must gain in order to earn minimal 5 points is 37,5. Student's participation at the exercises will be checked continuously</p> <p>During the semester a student must attend 30 exercise hours (out of total 45 hours) in order to gain minimal 8 points during the semester. The maximal number of gained points from this evaluation element is 12.</p> <p>During the semester there will be three (3) preliminary exams organised at the time of exercises each containing eleven (11) problems or questions. Each correctly solved problem or correctly answered question is worth one (1) point. A student must gain the total of 21 points from 3 preliminary exams (minimal 7 from each preliminary exam) in order to earn minimal 20 points. The maximal number of points a student can gain from this evaluation element is 32 points. A student who does not gain minimal 21 points during the semester from preliminary exam has a right to take a makeup preliminary exam covering the units from all programme exercises. The makeup preliminary exam will be organised upon completion of the teaching in the semester. The total number of points at the preliminary exam is 32 (1 point multiply with 0,9696). A student who passes the makeup preliminary exam with more than half of correct answers has a right to take the final exam.</p> <p>Before the final exam students will have chance to make up for exercises and the makeup preliminary exam in case of their excused absence.</p> <p>Minimal conditions for passing the first, second, third and forth evaluation element are summed up and they are worth 36 points all together.</p> <p>The final exam starts with a student's short analysis of results gained from the first four types of activities of attending lecture. Questions in the final exam will be put in a way that a student can answer in written and oral form. In the written form there will be 5 questions (20 points), 3 of which must be answered correctly (12 points) in order to take the oral exam. Every question has 4 subquestions and every right answered subquestion values 1 point. Therefore written exam has 20 points in total (5x4). The maximum number of points that can be gained at the final exam is 40 points, where 4 points = 1 correct answer. The student must show at least a sufficient knowledge at the final exam, with no regard to gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 12 (12 points minimal at written as well at oral exam). Minimal number of points on written exam</p>					

	together with oral exam must be 24 (40 max.) points. If student does not gain minimum 12 points on written exam one can not take oral exam. If student does not gain minimum 12 points in oral exam, one fails. In case a student does not satisfy at the final part of the exam, the lecturer determines time for re-examination.		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Teaching materials - written materials		web
	Handout materials		
	Selected chapters from: 1. Theresa Welch Fossum: Small Animal Surgery (all editions) 2. Noordsy J. L.; Ames N.K. – Food animal surgery (2006.) 3. Mike Ross, Sue Dyson-Lamenees in the Horse (2011.) 4. ICAR – atlas bolesti papaka (Atlas of hoof diseases)(2015.), 5. Jorg Auer, John Stick-Equine Surgery (2012.) 6. N.Kent Ames-Noordsy Food Animal Surgery (2014.) 7. Brinker, Piermattei, and Flo's Handbook of Small Animal Orthopedics and Fracture Repair (all editions). 8. Douglas H. Slatter: Textbook of Small Animal Surgery (all editions) 9. Spencer A. Johnston, Karen M. Tobias; Veterinary Surgery: Small Animal (1st/2nd edition).		
2.12. Optional literature (at the time of submission of study programme proposal)	1. Theresa Welch Fossum: Small Animal Surgery, 5E. (2018). 2. Noordsy J. L.; Ames N.K. – Food animal surgery (2006.) 3. Mike Ross, Sue Dyson-Lamenees in the Horse (2011.) 4. ICAR – atlas bolesti papaka (Atlas of hoof diseases)(2015.), 5. Jorg Auer, John Stick-Equine Surgery (2012.) 6. N.Kent Ames-Noordsy Food Animal Surgery (2014.)		
2.13. Quality assurance methods that ensure the acquisition of exit competences	During the semester there will be three (3) preliminary exams organised at the time of exercises each containing eleven (11) problems or questions. Each correctly solved problem or correctly answered question is worth one (1) point. A student must gain the total of 21 points from preliminary exams (minimal 7 from each preliminary exam) in order to earn minimal 20 points. The maximal number of points a student can gain from this evaluation element is 32 points. A student who does not gain minimal 21 points during the semester from preliminary exam has a right to take a makeup preliminary exam covering the units from all programme exercises. The makeup preliminary exam will be organised upon completion of the teaching in the semester. The total number of points at the preliminary exam is 32 (1 point multiply with 0,9696). A student who passes the makeup preliminary exam with more than half of correct answers has a right to take the final exam.		
2.14. Other (as the proposer wishes to add)			

STATE VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Krešimir Severin	1.6. Year of the study programme	5
1.2. Name of the course	State Veterinary Medicine	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	Magdalena Palić, DVM, assistant	1.8. Type of instruction (number of hours L + S + E + e-learning)	15+30+0+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	10%, 2
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The aim of the course is to get students acquainted with importance of veterinary activities through legal acts of the Republic of Croatia related to the area of animal health protection, implementation of veterinary public health measures, improvement of animal reproduction, veterinary protection of the environment, procedure for testing and placing on the market of veterinary medicinal products and inspection supervision in the veterinary field. Also, to students will be introduced the responsibilities, obligations and duties of natural and legal persons in relation to the protection of animals, including the protection of their life, health and welfare, the manner of handling animals, animal protection requirements (the keeping and raising of animals, when transporting them, using them in experiments, at the time of slaughter or humane killing). After completing this course students will be able to correctly interpreted, used, and finally implemented law and sub-law regulations in the area of veterinary activity.</p>		
2.2. Course enrolment requirements and entry competences required for the course	<p>Attended the course of Infectious Diseases in 11th semester.</p>		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> o ability to interpret, use, and implement of formal and material legislation of General Administrative Procedure Act, Veterinary Act, Livestock Act, Act on Veterinary Medicinal Products, Food Act, Animal protection Act and subordinate regulations / legislation based on above mentioned 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> o ability to conduct the following veterinary activities: <ul style="list-style-type: none"> o veterinary checks and controls on husbandries, farms, livestock markets, animal gathering and other facilities o issuing of animal health certificates, certificates for consignments of products of animal origin and feed, o enforce compulsory identification of animals and keep the stipulated records on the identification and registration of movement animals, o implement the stipulated measures for the detection, prevention, combating and control infectious or parasitic diseases, o take diagnostic material of animals, samples of products of animal origin and animal waste matter for the purpose of examining the health of animals 		

	<ul style="list-style-type: none"> o knowledge how to make a record and issue decisions in an administrative procedure related to veterinary activities
<p>2.5.Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>Lectures (6) I. Introduction to Veterinary Legislation and Regulatory Affairs – Introduction lesson. Meaning of administrative measures in animal health protection, implementation of veterinary public health measures, improvement of animal reproduction, veterinary protection of the environment, control of zoonosis and prevention of the occurrence of infectious or parasitic animal diseases. Terminology used in veterinary medicine i.e. veterinary activities. Constitution of Croatia - basic principles. Legal regulations (laws, regulations, orders, directives and instructions). Competence for decision legal acts. Ministry of Agriculture. General Administrative Procedure Act. Principles of administrative procedure. Dealing and administrative caseload processing. Making the official records and decision. Business and official correspondence.</p> <p>Lectures (7), Seminars (18) II. Veterinary Act – Essential provisions, terminology used in this Act. A) Animal health protection measures. Protection of animals from infectious or parasitic diseases. Health status of a herd, holding, compartment, region or state. Infected/endangered area. Measure for detecting and prevention of the occurrence of infectious or parasitic animal diseases. Measure for detecting and prevention of the occurrence of infectious or parasitic animal diseases. Fund and payment of costs in the carrying out of ordered measures. Securing of human and material resources. Notification and reporting of diseases. Programmes for monitoring, control and eradication of particular infectious and parasitic diseases (Equine viral arteritis, Anthrax, Rabies, Aujeszky's disease, Bluetongue, Fish diseases, Bee diseases, Brucellosis of cattle, Brucellosis of sheep and goats, Echinococcosis, Enzootic bovine leucosis, Bovine spongiform encephalopathy, Scrapie, Equine infectious anemia, Chlamydiosis of birds, Classical swine fever, Leptospirosis, Equine viral rhinopneumonitis, Salmonellosis, Foot and mouth disease, Trichinellosis, Tuberculosis of cattle, Vesicular stomatitis, Infectious bovine rhinotracheitis). National contingency plans. B) Veterinary activities implementation system. Veterinary organizations. Establishing procedure. Conditions regarding the arrangement of the facilities, premises, veterinary equipment and professional staff. Procedure for granting public authority. Control bodies. Official records and documents led by veterinary organizations. Veterinary staff. Croatian Veterinary Chamber. Code of veterinary ethics. Giving, extending and revoking licenses. C) Farms, assembling centres, fairs. Facilities for trade and gathering of animals. Registration, approval and conditions for the protection of animal welfare. Establishments conducting business operations with skins and furs. D) Establishments for business activities with reproductive materials. Conditions for approval and registration. E) Veterinary organization and other legal and natural persons for conducting disinfection, disinfestation and deratisation. Registration, requirements and record keeping. F) Identification of bovine, sheep, goats, pigs and ungulates. Central register of domestic animals. Movement document and temporary movement document. Manner of marking. Computer databases. Marking of dogs. Central dog register. Passport for pet animals. G) Health certificate and place of origin of the animal (internal certificate). Veterinary examinations on the place of dispatch in internal trade. Other compulsory examinations. H) Veterinary checks of movement across the border of the Republic of Croatia. Certification. International health certificate or public health certificate for the consignment - certificate. I) Animal by-products not for human consumption. Conditions which must be met by legal and natural persons carrying out collection and transport of unprocessed and processed animal by-products not intended for human consumption. J) Costs in veterinary activities. K) Administrative and inspection supervision. Veterinary inspector and border veterinary inspector. L) Central veterinary information system.</p> <p>Seminars (2) III. Act on Veterinary Medicinal Products - Essential provisions, terminology used in this Act. Procedure for testing and placing on the market, manufacture, labelling, wholesale and retail sale veterinary medicinal products. Pharmacovigilance.</p>

	<p>Seminars (2) IV. Food Act - Essential provisions, terminology used in this Act. Regulations relating to hygiene of food of animal origin and quality of feed. Official control of foodstuffs and animal feed. Terms of establishments dealing with food of animal origin. Undesirable and banned substances in animal feed. Maximum levels of residues.</p> <p>Lectures (2), Seminars (8) V. Animal Protection Act - General provisions – definitions. Procedures prohibited for the purpose of protecting animals. Conditions to be met by farms and the requirements for the protection of animals on farms. Protection of animals during health care provision and zootechnical interventions. Protection at the time of slaughter or humane killing of animals kept for production purposes. Protection of animals during transport. Requirements that must be met by control posts for animals. Authorised transporters and traders of animals. Protection of animals used in experiments and for the production of biological preparations. Requirements for the establishment an animal shelter. Protection of companion animals, wild animals in nature, animals in zoological gardens.</p>																													
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:																									
2.8.Student responsibilities	Attendance at lectures, seminars and writing seminar essay																													
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.54	Research		Practical training																									
	Experimental work		Report		Participation at seminars (other)	0.3																								
	Essay		Seminar essay		(other)																									
	Tests	0.96	Oral exam		(other)																									
	Written exam	1.2	Project		(other)																									
2.10. Grading and evaluating student work in class and at the final exam	<table border="1" data-bbox="466 1357 1407 2011"> <thead> <tr> <th data-bbox="466 1357 742 1435">Types of activities</th> <th data-bbox="742 1357 1005 1435">Minimal number of points</th> <th data-bbox="1005 1357 1407 1435">Maximal number of points</th> </tr> </thead> <tbody> <tr> <td data-bbox="466 1435 742 1476">Attending lectures</td> <td data-bbox="742 1435 1005 1476">3</td> <td data-bbox="1005 1435 1407 1476">6</td> </tr> <tr> <td data-bbox="466 1476 742 1579">6% of grade</td> <td colspan="2" data-bbox="742 1476 1407 1579">15 lectures hours: one lecture hour is multiplied with 0.4, and a student must attend minimal 8 lecture hours</td> </tr> <tr> <td data-bbox="466 1579 742 1641">Attending seminars</td> <td data-bbox="742 1579 1005 1641">8</td> <td data-bbox="1005 1579 1407 1641">12</td> </tr> <tr> <td data-bbox="466 1641 742 1744">12% of grade</td> <td colspan="2" data-bbox="742 1641 1407 1744">30 seminar hours – one seminar hour is multiplied with 0.4, and a student must attend minimal 20 seminar hours</td> </tr> <tr> <td data-bbox="466 1744 742 1807">Participation at seminars</td> <td data-bbox="742 1744 1005 1807">5</td> <td data-bbox="1005 1744 1407 1807">10</td> </tr> <tr> <td data-bbox="466 1807 742 1910">10% of grade</td> <td colspan="2" data-bbox="742 1807 1407 1910">Each student is obliged to prepare and present seminar work (Animal health protection measures of one disease) which will be assessed</td> </tr> <tr> <td data-bbox="466 1910 742 2011">Continuous knowledge checking</td> <td data-bbox="742 1910 1005 2011">20</td> <td data-bbox="1005 1910 1407 2011">32</td> </tr> </tbody> </table>						Types of activities	Minimal number of points	Maximal number of points	Attending lectures	3	6	6% of grade	15 lectures hours: one lecture hour is multiplied with 0.4, and a student must attend minimal 8 lecture hours		Attending seminars	8	12	12% of grade	30 seminar hours – one seminar hour is multiplied with 0.4, and a student must attend minimal 20 seminar hours		Participation at seminars	5	10	10% of grade	Each student is obliged to prepare and present seminar work (Animal health protection measures of one disease) which will be assessed		Continuous knowledge checking	20	32
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Continuous knowledge checking	20	32																												

	32% of grade	- first preliminary exam 10-16 points (16 question, each question is worth 1 point) - second preliminary exam 10-16 points (16 questions each question is worth 1 point)	
	Final exam	24	40
	40% of grade	In order to take the final exam a student must gain minimal 36 points from attending and participation at lectures and seminars and from continuous knowledge checking. Written exam form 24 to 40 points A student gets 8 questions – each correct answer is worth 5 points.	
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	General Administrative Procedure Act, Official Gazette No. 47/09	10	http://cadial.hidra.hr
	Veterinary Act, OFFICIAL GAZETTE NO. 82/13	10	http://cadial.hidra.hr
	Animal Protection Act, OFFICIAL GAZETTE NO. 102/17	10	http://cadial.hidra.hr
	Act on Veterinary Medicinal Products, OFFICIAL GAZETTE NO. 84/08	10	http://cadial.hidra.hr
	Food Act, OFFICIAL GAZETTE NO. 81/13	10	http://cadial.hidra.hr
	Ordinance on animal health conditions governing trade in ovine and caprine animals OFFICIAL GAZETTE NO. 51/09 (CELEX 31991L0068) 91/68/EEZ: Council Directive 91/68/EEC of 28 January 1991 on animal health conditions governing intra-Community trade in ovine and caprine animals Ordinance on animal health requirements applicable to trade in bovine animals and swine, OFFICIAL GAZETTE NO. 5/16 (CELEX 32015D0819) Commission implementing decision (EU) 2015/819 of 22 May 2015 amending Annex F to Council Directive 64/432/EEC as regards the format of the model health certificates for intra-Union trade in bovine animals and swine (notified under document C(2015) 3304) Ordinance on animal health conditions governing the movement and importation from third countries of equidae OFFICIAL GAZETTE NO. 154/08 (CELEX 31990L0426) Council Directive 90/426/EEC of 26 June 1990 on animal health conditions governing the movement and import from third countries of equidae Ordinance on the conditions for the placing on the market and the import of aquaculture animals and products thereof and laying down a list of vector species OFFICIAL GAZETTE NO 5/10 (CELEX 32008R1251) COMMISSION REGULATION (EC) No 1251/2008 of 12 December 2008 implementing Council Directive 2006/88/EC as regards conditions and certification requirements for the placing on the market and the import into the Community of aquaculture animals and products thereof and laying down a list of vector species	10	http://eur-lex.europa.eu

	<p>Ordinance laying down the conditions to the met by veterinary organisations, veterinary practices and veterinary services in the system of implementation of veterinary activity, OFFICIAL GAZETTE NO. 103/13</p> <p>Ordinance on the procedure of recognition of professional qualifications and conditions for temporary or occasional performing veterinary activities, OFFICIAL GAZETTE NO. 2/10 (CELEX 32005L0036) Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications (Text with EEA relevance)</p> <p>Ordinance on the conditions and procedures for granting, extending and revoking approval to practice veterinary medicine (the licensee), OFFICIAL GAZETTE NO. 2/10</p> <p>Ordinance on the protection of animals kept for farming purposes, OFFICIAL GAZETTE NO. 44/10 (CELEX 31998L0058) Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes Ordinance laying down the conditions to the met by farms and the requirements for the protection of animals on farms, OFFICIAL GAZETTE NO. 136/05</p> <p>Ordinance laying down minimum standards for the protection of pigs, OFFICIAL GAZETTE NO. 119/10 (CELEX 32008L0120) Council Directive 2008/120/EC of 18 December 2008 laying down minimum standards for the protection of pigs (Codified version)</p> <p>Ordinance laying down minimum standards for the protection of calves, OFFICIAL GAZETTE NO. 110/10 (CELEX 32008L0119) Council Directive 2008/119/EC of 18 December 2008 laying down minimum standards for the protection of calves (Codified version)</p> <p>Ordinance laying down minimum standards for the protection of laying hens, OFFICIAL GAZETTE NO. 77/10, 99/10, 51/11 (CELEX 31999L0074) Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens</p> <p>Ordinance laying down minimum rules for the protection of chickens kept for meat production, OFFICIAL GAZETTE NO. 79/08. (CELEX 32007L0043) Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production (Text with EEA relevance)</p> <p>Ordinance on the conditions to be met by assembly centres, markets, transporters of animals and traders of animals, OFFICIAL GAZETTE NO. 098/08</p> <p>Ordinance on the compulsory identification and registration of bovine animals, OFFICIAL GAZETTE NO. 108/13</p> <p>Ordinance on the implementation of obligatory identification and registration of bovine animals, OFFICIAL GAZETTE NO. 108/13</p> <p>Ordinance on the compulsory identification and registration of ovine and caprine animals, OFFICIAL GAZETTE NO. 111/07, 135/08, 154/08, 81/11, 124/11</p> <p>Ordinance on the implementation of obligatory identification and registration of ovine and caprine animals, OFFICIAL GAZETTE NO. 111/07, 128/08, 154/08, 9/10, 110/10</p> <p>Ordinance on the compulsory identification and registration of pigs, OFFICIAL GAZETTE NO. 148/09, OFFICIAL GAZETTE NO. 12/11</p> <p>Ordinance on identification and registration of equidae, OFFICIAL GAZETTE NO. 123/09</p>		
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	<p>(CELEX 32008R0504) Commission Regulation (EC) No 504/2008 of 6 June 2008 implementing Council Directives 90/426/EEC and 90/427/EEC as regards methods for the identification of equidae Text with EEA relevance</p> <p>Ordinance on identification of dogs, OFFICIAL GAZETTE NO. 72/10</p> <p>Ordinance on the model passport for pet animals, OFFICIAL GAZETTE NO. 142/08</p> <p>(CELEX 32003D0803) 2003/803/EZ: 2003/803/EC: Commission Decision of 26 November 2003 establishing a model passport for the intra-Community movements of dogs, cats and ferrets (Text with EEA relevance.) (notified under document number C(2003) 4359)</p> <p>Ordinance on the animal health requirements applicable to the trade in and imports of semen of domestic animals of the porcine species, OFFICIAL GAZETTE NO. 112/08</p> <p>(CELEX 31990L0429) Council Directive 90/429/EEC of 26 June 1990 laying down the animal health requirements applicable to intra- Community trade in and imports of semen of domestic animals of the porcine species</p> <p>Ordinance on animal health requirements applicable to trade in and imports of semen of domestic animals of the bovine species, OFFICIAL GAZETTE NO. 60/08, 135/08</p> <p>(CELEX 31988L0407) Council Directive 88/407/EEC of 14 June 1988 laying down the animal health requirements applicable to intra- Community trade in and imports of deep-frozen semen of domestic animals of the bovine species</p> <p>Ordinance on importation conditions of semen of domestic animals of the bovine species, OFFICIAL GAZETTE NO. 141/10</p> <p>(CELEX 32008D0120) 2008/120/EC: Commission Decision of 7 February 2008 amending Annex D to Council Directive 88/407/EEC and Commission Decision 2004/639/EC laying down the importation conditions of semen of domestic animals of the bovine species (notified under document number C(2008) 409) (Text with EEA relevance)</p> <p>Ordinance on the conditions and manner of conducting disinfection, disinsection and deratisation in veterinary activities, OFFICIAL GAZETTE NO. 139/10</p> <p>Ordinance on veterinary checks of live animals in internal trade and the certificate of health condition and place of origin of the animal, OFFICIAL GAZETTE NO. 087/08</p> <p>Ordinance on the charges for veterinary checks of live animals in domestic transport and the certificate of animal health and place of origin, OFFICIAL GAZETTE NO. 104/08</p> <p>Ordinance on the principles governing the organisation of veterinary checks and controls of live animals moving across the border of the Republic of Croatia, OFFICIAL GAZETTE NO. 153/09, 154/09, 28/10</p> <p>(CELEX 31991L0496) Council Directive 91/496/EEC of 15 July 1991 laying down the principles governing the organization of veterinary checks on animals entering the Community from third countries and amending Directives 89/662/EEC, 90/425/EEC and 90/675/EEC (O J L 268, 24.9.1991)</p> <p>Ordinance on the manner of conducting veterinary checks and on certification conditions for products destined for introduction into free zones, free warehouses, customs warehouses or for operators supplying cross border means of sea transport, OFFICIAL GAZETTE NO. 94/10</p> <p>(CELEX 32005D0092) 2005/92/EC: Commission Decision of 2 February 2005 as</p>		
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	<p>regards animal health conditions, certification and transitional provisions concerning the introduction and storage period for consignments of certain products of animal origin in free zones, free warehouses and premises of operators supplying cross border means of sea transport in the Community (notified under document number C(2005) 191) (Text with EEA relevance)</p> <p>Ordinance on animal health and public health requirements governing trade in and imports of certain products, OFFICIAL GAZETTE NO. 81/09 (CELEX 31992L0118) Council Directive 92/118/EEC of 17 December 1992 laying down animal health and public health requirements governing trade in and imports into the Community of products not subject to the said requirements laid down in specific Community rules referred to in Annex A (I) to Directive 89/662/EEC and, as regards pathogens, to Directive 90/425/EEC Naredba o posebnim mjerama za uvoz proizvoda životinjskog podrijetla iz određenih trećih zemalja u RH, OFFICIAL GAZETTE NO. 61/10</p> <p>Ordinance on veterinary medicinal products, OFFICIAL GAZETTE NO. 30/09, 14/10, 146/10, 32/12 (CELEX 32001L0082) Directive 2001/82/EC of the European Parliament and of the Council of 6 November 2001 on the Community code relating to veterinary medicinal products (CELEX 32004L0028) Directive 2004/28/EC of the European Parliament and of the Council of 31 March 2004 amending Directive 2001/82/EC on the Community code relating to veterinary medicinal products (Text with EEA relevance)</p> <p>Ordinance on certain veterinary medicinal products for food-producing animals from the requirement of a veterinary prescription, OFFICIAL GAZETTE NO. 67/09 (CELEX 32006L0130) Commission Directive 2006/130/EC of 11 December 2006 implementing Directive 2001/82/EC of the European Parliament and of the Council as regards the establishment of criteria for exempting certain veterinary medicinal products for food-producing animals from the requirement of a veterinary prescription (Text with EEA relevance)</p> <p>Ordinance on the protection of animals at the time of slaughter or killing, OFFICIAL GAZETTE NO. 039/08 (CELEX 31993L0119) Council Directive 93/119/EC of 22 December 1993 on the protection of animals at the time of slaughter or killing</p> <p>Ordinance on dangerous dogs, OFFICIAL GAZETTE NO. 117/08</p> <p>Ordinance on the requirements for the breeding of companion animals OFFICIAL GAZETTE NO. 056/09</p> <p>Ordinance on the protection of animals used for scientific purposes, OFFICIAL GAZETTE NO. 047/11 (CELEX 32010L0063) Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes Text with EEA relevance</p> <p>Ordinance on the acceptance for breeding purposes of pure-bred breeding animals of the bovine species, OFFICIAL GAZETTE NO. 081/10 (CELEX 31987L0328) Council Directive 87/328/EEC of 18 June 1987 on the acceptance for breeding purposes of pure-bred breeding animals of the bovine species (CELEX 32005L0024) Council Directive 2005/24/EC of 14 March 2005 with regard to the use of ova and embryos and storage</p>		
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	<p>centres for semen from pure-bred breeding animals of the bovine species (Text with EEA relevance)</p> <p>Ordinance on the methods for monitoring performance and assessing the genetic value of pure-bred breeding animals of the bovine species, OFFICIAL GAZETTE NO. 134/05, 142/08</p> <p>Ordinance on the methods for monitoring performance and assessing the genetic value of pure-bred breeding animals of the equines, OFFICIAL GAZETTE NO. 134/05</p> <p>Ordinance on the methods for monitoring performance and assessing the genetic value of pure-bred breeding animals of the ovine and caprine animals, OFFICIAL GAZETTE NO. 134/05</p> <p>Ordinance on the methods for monitoring performance and assessing the genetic value of pure-bred breeding animals of the pigs, OFFICIAL GAZETTE NO. 134/05</p> <p>Ordinance on the monitoring of zoonoses and zoonotic agents, OFFICIAL GAZETTE NO. 052/05, 42/13</p> <p>(CELEX 32003L0099) Directive 2003/99/EC of the European Parliament and of the Council of 17 November 2003 on the monitoring of zoonoses and zoonotic agents, amending Council Decision 90/424/EEC and repealing Council Directive 92/117/EEC</p> <p>Ordinance on the notification of animal diseases, OFFICIAL GAZETTE NO. 062/11, 114/11</p> <p>(CELEX 31982L0894) Council Directive 82/894/EEC of 21 December 1982 on the notification of animal diseases within the Community</p> <p>(CELEX 31989D0162) 89/162/EEC: Commission Decision of 10 February 1989 supplementing the Annexes to Council Directive 82/894/EEC on the notification of animal diseases within the Community</p> <p>(CELEX 31992D0450) 92/450/EEC: Commission Decision of 30 July 1992 amending for the third time Council Directive 82/894/EEC on the notification of animal diseases within the Community and temporarily amending the frequency of notification for bovine spongiform encephalopathy</p> <p>(CELEX 31998D0012) Decision of the European Central Bank of 3 November 1998 concerning public access to documentation and the archives of the European Central Bank (ECB/1998/12)</p> <p>(CELEX 32000D0556) 2000/556/EC: Commission Decision of 7 September 2000 amending Council Directive 82/894/EEC concerning the notification of animal diseases in the Community (notified under document number C(2000) 2494) (Text with EEA relevance)</p> <p>(CELEX 32002D0788) 2002/788/EC: Commission Decision of 10 October 2002 amending Council Directive 82/894/EEC on the notification of animal diseases within the Community (Text with EEA relevance) (notified under document number C(2002) 3670)</p> <p>Order on measures to protect animals from infectious and parasitic diseases and the financing thereof in the current year</p> <p>Instructions on the manner of implementing the animal health controls measures prescribed by the Order on measures to protect animals from infectious and parasitic diseases and the financing thereof in the current year</p> <p>Ordinance on guidelines for the purpose of the risk-based animal health surveillance schemes, OFFICIAL GAZETTE NO. 88/10</p> <p>(CELEX 32008D0896) 2008/896/EC: Commission Decision of 20 November 2008 on guidelines for the purpose of the risk-based animal health surveillance schemes provided for in Council Directive 2006/88/EC</p>		
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	<p>(notified under document number C(2008) 6787) (Text with EEA relevance)</p> <p>Animal by-products not intended for human consumption (CELEX 32009R1069) Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation) (CELEX 32011R0142) Commission Regulation (EU) No 142/2011 of 25 February 2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive Text with EEA relevance</p> <p>Hygiene rules for food of animal origin (CELEX 32004R0853) Regulation (EC) No 853/2004 of the European Parliament and of the Council, of 29 April 2004, laying down specific hygiene rules for food of animal origin. (CELEX 32004R0882) Regulation (EC) No 882/2004 on official controls performed to ensure the verification of compliance with feed and food law. Hygiene rules for feed (CELEX 32005R0183) Regulation (EC) No 183/2005 of the European Parliament and of the Council of 12 January 2005 laying down requirements for feed hygiene (Text with EEA relevance). (CELEX 32009R0152) Commission Regulation (EC) No 152/2009 of 27 January 2009 laying down the methods of sampling and analysis for the official control of feed (Text with EEA relevance).</p> <p>Ordinance on the levels and frequencies of sampling for the monitoring of certain substances and residues thereof in certain animal products, OFFICIAL GAZETTE NO. 015/10 (CELEX 31997D0747) 97/747/EC: Commission Decision of 27 October 1997 fixing the levels and frequencies of sampling provided for by Council Directive 96/23/EC for the monitoring of certain substances and residues thereof in certain animal products (Text with EEA relevance)</p> <p>Expenditure in the veterinary field (CELEX 32009D0470) 2009/470/EC: Council Decision of 25 May 2009 on expenditure in the veterinary field (Codified version)</p>		
2.12.Optional literature (at the time of submission of study programme proposal)			
2.13.Quality assurance methods that ensure the acquisition of exit competences	Anonymous student survey about all aspects of teaching.		
2.14.Other (as the proposer wishes to add)			

VETERINARY EPIDEMIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Marina Pavlak	1.6. Year of the study programme	5th
1.2. Name of the course	Veterinary Epidemiology	1.7. Credits (ECTS)	2,5
1.3. Associate teachers	Assist. Prof. Denis Cvitković, Assoc. Prof. Dean Konjević	1.8. Type of instruction (number of hours L + S + E + e-learning)	4+0+26+0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	compulsory	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be able to identify methods used in epidemiologic studies and to how apply them in different cases and situations. They will be able to describe the disease in population in relation to measurements of disease occurrence and how to find and explain errors as components of measurements as well as how to use appropriate methods for sampling. Students will be able to evaluate the diagnostic tests and to interpret them in relation to disease occurrence and aplying the control strategy. They will know how to use the observational studies and to calculate and determine risk factors in population		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Identifying the types of data and collecting, sorting and processing of data Applying epidemiological methods in biomedical research Risk interpretation Evaluation of diagnostic testing and interpretation of sensitivity, specificity and predictive values of the diagnostic test Participation in the implementation of preventive measures Participation in the planning of programs of animal health care Application of epidemiological methods in research		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	To interpret the basic epidemiological concepts To distinguish and interpret the epidemiological studies and to calculate risk and interpret risk factors in relation to disease To distinguish and calculate the measures of the epidemiological assessment of disease occurrence and association To evaluate and interpret the diagnostic tests		
2.5. Course content broken down in detail	1 Introduction to veterinary epidemiology (Past, present and future of veterinary epidemiology, definition of veterinary epidemiology and learning		

by weekly class schedule (syllabus)	<p>objectives, role of veterinary epidemiology and basic epidemiological concepts) = lecture 1 hour</p> <p>2 Type of measure of appearances in epidemiology (Measurement of frequency and connection and potential effect) - lecture 1 hour; exercises: 2 hours</p> <p>3 Epidemiological study (Introduction in epidemiological study, type of epidemiological study, observation and interventional epidemiology); 4 Descriptive epidemiology (Learning objectives, measurement of disease frequency, standardization of risk) – lecture 1 hour; exercises: 2 hours</p> <p>5 Analytical epidemiology (Learning objectives, Cohort studies, case control, study method of prevalence, concept of risk, identification of risk factor); 6 Variability of appearance and connection of appearance (Reliability and validity of tests or measurement, type of connection, criteria and determination of causal connection) - lectures 2 hours; exercises: 6 hours</p> <p>7 Quantitative aspects or evaluation and interpretation of diagnostic tests (Diagnostic process and diagnostic tests, evaluation and comparison of diagnostic tests, interpretation of results, methods of criteria selection, likelihood ratio, decision reaching and analysis) - lectures: 2 hours; exercises: 4 hours</p> <p>8 Applied veterinary epidemiology (Applying statistical methods in epidemiology, sampling methods, sample size considerations, estimation (distribution) and testing of hypothesis, measurements of central tendencies and measures of variability, measurements of probability and statistical importance, population and sample – estimation of population parameters and testing of differences, correlation and regression, stratification, nonparametric tests for independent and dependent samples) - lecture 1 hour; exercises: 4 hours</p> <p>9 Errors of measurement in epidemiology (Accidental errors, systemic errors); 10 Risk analysis (Herd diagnostic, risk analysis) - lecture: 1 hour</p> <p>11 Models (Models in veterinary epidemiology, basis of simulation and approach to simulation modelling, simulation of discreet occurrences, systemic dynamics); 12 Modelling (Principle of modelling, aim of modelling, problem solving by means of models); 13 Comparative epidemiology - lecture: 1 hour ; exercises: 2 hour</p>					
2.6.Format of instruction:	x lectures <input type="checkbox"/> seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	x independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of	Class attendance	0,45	Istraživanje		Practical training	0,125
	Experimental work		Referat		Activity	0,25
	Essay		Seminarski rad		(other)	

<i>ECTS credits is equal to the ECTS value of the course)</i>	Tests	0,8	Usmeni ispit	1	(other)	
	Written exam		Projekt		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Here is the evaluation table for the Veterinary epidemiology course which consists of 10 lecture hours and 20 exercise hours, and which is worth 2.5 ECTS points. Students are evaluated on the basis of the number of periods for the course and the gained model of evaluation. Points and activities which are evaluated for the Veterinary epidemiology course.					
	Types of activities	Activity	Vrijednost 1 sata ili 1 aktivnosti	Minimal number of points	Minimal number of points	
	Attending lectures	4 hours	1,5	3	6	
	Attending exercises	26 hours	0,46	8	12	
	Participation at exercises	Task solving - 10 tasks	1	5	10	
	Continuous knowledge checking	Test – 32 points in total	16	20	32	
	Final exam	40 points in total	1	24	40	
	Total			60	100	
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Pfeiffer, D. (2009): Veterinary epidemiology; An introduction. Epidemiology Division Department of Veterinary Clinical Sciences, The Royal Veterinary College, University of London				dodupno online na: http://www.rvc.ac.uk/about/our-people/dirk-pfeiffer https://www.researchgate.net/publication/305279557_Introduction_to_Veterinary_Epidemiology	

	Risk analysis: Terrestrial Animal Health Code (2013). OIE		dostupno na: http://www.oie.int/international-standard-setting/terrestrial-code/access-online/
2.12.Optional literature (at the time of submission of study programme proposal)	Triola. M. F: (1989): Elementary statistics, 4 th edition. Benjamin/Cummings Publishing Company Inc.		
2.13.Quality assurance methods that ensure the acquisition of exit competences	<p>Quality assurance methods that ensure the acquisition of exit competences be implemented through:</p> <ul style="list-style-type: none"> presence at the lectures presence at the exercises activity during the exercises colloquiums final exam 		
2.14.Other (as the proposer wishes to add)			

VETERINARY LEGISLATION AND FOOD SAFETY CONTROL

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. prof. Nevijo Zdolec, PhD	1.6. Year of the study programme	V
1.2. Name of the course	Veterinary Legislation and Food Safety Control	1.7. Credits (ECTS)	3,5
1.3. Associate teachers	Prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, assoc. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	28+17+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Compulsory elective subject	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	To familiarize students with the contemporary principles of organization and functioning of veterinary inspection in accordance with the Food act and EU legislation. The objective is to elaborate certain laws related to the veterinary inspection authority. Getting acquired with the regulations that enable the performance of veterinary activities in food safety and their proper application is the knowledge that will help students during the inspection work.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of study track "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	In the frame of veterinary public health and food safety to understand current laws related to the veterinary inspection and their application in the performance of veterinary activities.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>By the completion of the course students should be able to:</p> <ul style="list-style-type: none"> -know of the structure of the competent authority and the overall organization of veterinary inspection -distinguish between general and special tasks of veterinary control in consumers protection -interpret legislation connected to the veterinary controls in the food chain -identify the responsibilities of veterinary inspection -explain the importance of certification and labeling in terms of food safety -consolidate the sample reports and expert opinions in the field of hygiene and technology of food of animal origin with the standards 		
2.5. Course content broken down in detail by weekly	1. Organization of veterinary inspections in food chain. 2. European food safety assurance system. 3. Veterinary controls and consumers protection. 4. Official controls. 5. Food fraud-legislation. 6. Legislation in meat hygiene. 7. Legislation in milk hygiene. 8. Fish products-legislation. 9. Sampling for official		

class schedule (syllabus)	controls. 10. Legislation: eggs, honey, novel food, GMO. 11. Authorizations and responsibilities in food inspection, accreditation. 12. Legislation: protection of food origin 13. Food traceability, RASFF. 14. Regulations on food labelling. Seminars: 1. Modernisation of meat inspection. 2. Registration and approval of food production facilities. 3. Regulation on animal welfare in slaughterhouse. 4. Regulation on animal origin by-products. 5. Legislation: protection of food origin, labelling. 6. Regulation on food contaminants.					
2.6.Format of instruction:	x lectures x seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,6 3	Research		Practical training	
	Experimental work		Report		Activity during course	0,35
	Essay		Seminar essay		(other)	
	Tests	1,1	Oral exam	1,4	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	ACTIVITIES		MINIMAL SCORE		MAXIMAL SCORE	
	Lecture attendance		3		6	
	28 hours of lectures (coefficient: 0,21)		Student must attend 14 hours of lectures in order to gain 3 points		28 x 0,21 = 6 points	
	Seminars attendance		8		12	
	17 hours of seminars (coefficient: 0,7)		student must attend 11 hours of seminars in order to gain 4 points		17 x 0,7 = 12 points	
	Activity at seminars		5		10	
	2 oral questions during seminars (2,5 points each) Seminar presentation		2 correct answers on asked questions			

	(5 points)		
	Continuous knowledge checking	20	32
	1 written exams, 4 questions 1 question = 8 points	A student must give correct answers to 2,5 questions in order to gain 20 points	4 correct answers x 8 = 32 points
	Final exam	24	40
	Oral exam, 5 questions. 1 question = 8 points	A student must give correct answers to 3 questions in order to gain 24 points	5 correct answers x 8 = 40 points
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Van der Meulen B., M. Van der Velde (2004): Food Safety Law in the European Union. An Introduction. European Food Law Institute series. Wageningen Academic.	1	
	Reg EZ 178/2002		pdf
	Hygienic package (Reg 852/2004, 853/2004, 2017/625)		pdf
2.12. Optional literature (at the time of submission of study programme proposal)	Selected national and EU food legislation.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	During the course, continuous assessment shall be carried out by means of preliminary test and activities during seminars.		
2.14. Other (as the proposer wishes to add)			

LIST OF ELECTIVE SUBJECTS

Elective Subjects

Agricultural Economics and Rural Development
Anatomy of Laboratory Animals
Animal Dietetics
Archaeozoology
Autochthonous Meat Products
Autochthonous Dairy Products
Biology and Conservation of Marine Mammals
Biology and Ecology of Predators
Breeding and Husbandry of Rabbits and Furbearers
Carcass Quality at the Slaughter Line
Chemistry of Natural Compounds
Clinical Physiology
Comparative Odontology
Comparative Anatomy of Skeletal System
Comparative Mucosal Immunology
Comparative Nutrition
Conservation and Management of Endangered Species
Cynology and Felinology
Cytometry in Clinical Veterinary Medicine
Diseases of Honeybees in Contemporary Production
English for Academic purposes I
English for Academic purposes II
Feed Additives - Health Modulators
Fish Morphology
Fishery
Fundamentals of Agronomy
Fundamentals of Ecologic Livestock Breeding
Fundamentals of Physics for Diagnostics Methods
Fundamentals of Scientific Research
Fundamentals of the Tumor Molecular Pathology and Histology
Game Zoology
Hunting and Nature Protection
Hygienic Quality of Game Meat
Hygiene and Quality of Poultry Meat
Hygiene and Quality of Fish Meat
Parasitic Zoonotic Diseases
Physiology of Birds
Physiology of Amphibians and Reptiles

Pigeon Keeping and Breeding
Positive Impact of Animals on Human Health
Reptile Morphology
Selected Chapters in Biomedical Physics for Veterinarians
Specific Anatomical Structures of the Locomotor Apparatus of the Horse
Sport and Working Animals
Structure and Function of Cell
The Role of Veterinarians at Organic Farms
Veterinary Clinical Microbiology
Veterinary Clinical Pathology
Veterinary Nuclear Medicine
Veterinary Ethics
Wildlife Diseases

AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Denis Cvitković	1.6. Year of the study programme	3
1.2. Name of the course	Agricultural Economics and Rural Development	1.7. Credits (ECTS)	2
1.3. Associate teachers	Prof. Marina Pavlak, DVM, PhD, Assoc. Prof Dean Konjević, DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	10 + 0 + 20
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Explain the meaning of the basic economic terms Explain the relation between rural area and agriculture, as well as the rational of integral and sustainable development of rural area present different theories of agricultural development, general economic, agricultural, regional and rural policy prepare the students for appropriate participation in preparing and implementation of the rural area and agricultural development prepare the students for the appropriate economic analysis methods implementation		
2.2. Course enrolment requirements and entry competences required for the course	Completed courses: Animal hygiene, Environment, behavior and animal welfare, General nutrition, Applied nutrition, Animal breed characteristics, Animal husbandry and animal production		
2.3. Learning outcomes at the level of the programme to which the course contributes	To be aware of economic and social environment in which veterinarians work, appropriately responding to challenges. To be aware of personal limitations. To be able to find for professional advice, help and support.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After the successfully completed course and passed exam, student will be able: <ul style="list-style-type: none"> - to analyse and clarify the longterm tendencies in the rural area and agricultural development in Croatia - to participate in creating and implementing rural development and agricultural projects - to interpret measures of agricultural policy - to compile planned and actual calculations - to compute and interpret the business success indicators 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	DAY 1. (6 hours) Definition of basic terms, Macroeconomic aggregations, Rural area and its activities DAY 2. (6 hours) Agriculture and rural development, Agriculture development theories, Placement of agriculture in economy development DAY 3. (6 hours) The tasks of agriculture, Agricultural structure and socio-economical traits of agricultural enterprises DAY 4. (6 hours)		

	Agricultural policy, Trends in agricultural development, DAY 5. (6 hours) Basic traits and trends in plant production, Basic traits and trends in animal production					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor <input checked="" type="checkbox"/> business intelligence (other)		2.7. Comments:	
2.8. Student responsibilities	attending lectures, attending exercises, writing seminar works, participation in exercises and seminars, continuous knowledge checking, final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay	0,2	(other)	
	Tests	0,64	Oral exam	0,4	(other)	
	Written exam	0,4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Grading and evaluation: class attendance, tests, seminar essays, exam Final exam: written and oral					
	Activity		Minimal score		Maximal score	
	Class attendance		3		6	
	Exercise attendance		8		12	
	Seminar essay		5		10	
	Tests		20		32	
	Final exam		24		40	
Total		60		100		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	1. Barkley. A., Barkley. P. (2016): Principles of Agricultural Economics, second edition. Routledge, Oxford, UK.				internet	
2.12. Optional literature (at the time of submission of study programme proposal)	1. Bijman, J., Muradian, R., Schurmann, J. (2016): Cooperatives, Economic Democratization and Rural Development. Edward Elgar. Cheltenham, UK. 2. Martinho, V. (2015): The Agricultural Economics of the 21 st Century. Springer. Cham, Switzerland.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Monitoring class attendance, tests, seminar essays, final exam					
2.14. Other (as the proposer wishes to add)						

ANATOMY OF LABORATORY ANIMALS

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Damir Mihelić	1.6. Year of the study programme	2 nd (second)
1.2. Name of the course	Anatomy of Laboratory Animals	1.7. Credits (ECTS)	2
1.3. Associate teachers	Prof Snježana Vuković, Assist. Mirela Pavić, PhD, DVM, Denis Leiner, DVM, Snježana Ćurković, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	6 + 0 + 24
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	25
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 1 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Introduce students to the basics of anatomy most commonly used laboratory animals.		
2.2. Course enrolment requirements and entry competences required for the course	Undergraduate courses in anatomy of domestic animals (Anatomy with organogenesis of the domestic animals I., II.)		
2.3. Learning outcomes at the level of the programme to which the course contributes	The acquisition of knowledge of the body's anatomy and comparative anatomy of small rodents, which are used as laboratory animals and pets as a basis for the superstructure of pathology and clinical sciences in further study.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1 st Overcoming basic principles sectional techniques of laboratory animals 2 nd Describe the basic structure of the body most commonly used laboratory animals. 3 rd Identify the basic characteristics of comparative anatomical structure of laboratory animals and to compare them with the anatomy of domestic animals 4 th Connect knowledge with future professional work in scientific and technical laboratories.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Structure of the chicken egg. The embryonic development of chicken embryos (structure of the chicken egg; preembryonal development of chicken embryos, embryonal development of chicken embryos; bloodstream of the chicken embryo allantoic circulation of chicken embryos; chicken embryos amnion, yolk sac of the chicken embryo, allantoic sac of the chicken embryo ductus omphaloentericus of the chicken embryos); 2. experimental strains of mice and rats (strains of experimental mice and rats, homozygous and heterozygous animals; getting highly related strains of laboratory animals); 3. Anatomy of laboratory animals (mammary gland of the mouse and rat, brown adipose tissue, the digestive organs of the mouse, rat and guinea pigs; respiratory organs of the mouse, rat and guinea pigs; urinary-genital organs of the mouse, rat and guinea pigs; circulatory organs of the mouse, rat and guinea pigs; endocrine glands of mouse, rat and guinea pig, mouse brain, rats and guinea pigs; blood sampling of the mouse, rat and guinea pigs); 4. Reproduction and Embryology laboratory animals (breeding of laboratory animals; vaginal plug; preembryonal mouse development, the embryonic		

	<p>development of the mouse, the mouse fetal development, fetal membrane mouse, mouse placenta, skeletal development of the mouse). Common anatomical characteristics of rats, mice, hamsters, guinea pigs and rabbits - 2 hours Section of the rat: open skin, locomotor system, mammary gland - 4 hours Section of the rat: opening the abdominal cavity, digestive organs, pancreas, liver, spleen - 4 hours Section of the rat: opening the abdominal cavity, digestive organs, pancreas, liver, spleen, - 4 hours Section of the rat urogenital organs - 4 hours Section of the rat: opening the thoracic cavity, pleura, respiratory organs, the heart, large blood vessels - 4 hours Section of the rat head and neck, nose and mouth, brain 4 hours Structure of the chicken embryo - 4 hours</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Students activity at the exercises	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>1st Attendance 2nd Students activity in training - During maintenance exercises in anatomy, student activity during the exercises is estimated by examining the composition student dissects and setting short questions related section of rat or a short oral presentation on a given topic earlier. 3rd Final Exam - The final exam is conducted by oral examination of the student.</p>					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Popesko, P., V. Rajtova, J. Horak: Atlas anatomie malyh laboratornych zvierat, 1 Kralik, Morča. Priroda. Bratislava, 1990.					
	Popesko, P., V. Rajtova, J. Horak: Atlas anatomie malyh laboratornych zvierat, 1 Myš, Chrček zlaty. Priroda. Bratislava, 1990.					
	Komarek, V., L. Malinovsky, L. Lemež (1982.): Anatomia avium domesticorum et embryologia galii. Priroda. Bratislava					
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Simeons, P: Course on laboratory animal science 1997: Comparative anatomy of laboratory rabbits and rodents. Department of Morphology, Faculty of Veterinary Medicine, University of Gent. Belgium. 1997. Zutphen, L. F. M. van, V. Baumans, A. C. Beynen: Principles of laboratory animal science. Elsevier, Amsterdam. Netherlands. 1993. Hebel, R., M. W. Stromberg: Anatomy and embriology of the laboratory rat. BioMed Verlag, Worthsee, Germany. 1986.</p>					

2.13. Quality assurance methods that ensure the acquisition of exit competences	Regularly conducting .continunous assesement of the students knowledge.
2.14. Other (as the proposer wishes to add)	

ANIMAL DIETETICS

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Hrvoje Valpotić	1.6. Year of the study programme	5 th year
1.2. Name of the course	Animal Dietetics	1.7. Credits (ECTS)	2,0
1.3. Associate teachers	Full professor Željko Mikulec, Assistant Professor Diana Brozić	1.8. Type of instruction (number of hours L + S + E + e-learning)	5 L + 5 S + 20 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The course objective is to show students the newest findings in clinical nutrition and animal dietetics that has not been sufficiently covered in obligatory courses, and ensure the students' acquired knowledge skills and competences as an important factor in the prevention of a significant number of diseases as well as a support of basic therapy in the treatment of companion and farm animals.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - synthesize current knowledge about the role of nutrition in animal health - assess the implications of inadequate nutrition on performance and disease occurrence 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - to implement adequate diets in certain stages of life - to assess the suitability of feeding strategies during certain diseases and levels of production - to know the influence of nutrition in decision making in veterinary practice 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures (5 hours):</p> <ul style="list-style-type: none"> • Dietetics in veterinary medicine, terminology, nutritional status • Deficiency of certain nutrients • Feeding in various stages of life • Feeding of sick animals <p>Seminars (5 hours):</p> <ul style="list-style-type: none"> • Evaluation of nutritional status (feed, laboratory analyses) <p>Exercises (20 hours):</p> <ul style="list-style-type: none"> • Dogs and cats (gestation and lactation, performance animals, senior animals, growing animals, diseases) 		

	<ul style="list-style-type: none"> • Horses (foals, sport horses, senior animals, diseases, colics) • Preventive and clinical nutrition of ruminants (metabolic diseases) • Pig dietetics (deficiencies of certain nutrients, metabolic disorders) • Poultry dietetics (deficiencies of certain nutrients.) • Laboratory animal dietetics (influence of fiber on occurrence of certain diseases, rodent diabetes) 					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Participation at exercises	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Pibot, P., V. Biourge, D. Elliott (2006): Encyclopedia of canine clinical nutrition, Aniwa SAS, France					
2.12.Quality assurance methods that ensure the acquisition of exit competences						
2.13.Other (as the proposer wishes to add)						

ARCHAEOZOOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Tajana Trbojević Vukičević	1.6. Year of the study programme	Second year, FOURTH semester
1.2. Name of the course	ARCHAEOZOOLOGY	1.7. Credits (ECTS)	2
1.3. Associate teachers	Associate Prof. Snježana Kužir; Kim Korpes, dr. med. vet.; Magdalena Kolenc, dr. med. vet	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+5+15
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1. level (application of VEF-LMS)
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will get inside the basic archaeozoological methods, learn to determine skeletal elements and taxonomic affiliation, learn to classify animal's age and sex based on tooth eruption and attrition and long bones epiphysis fusing/unfusing, learn to evaluate animals withers height and biomass, know how to recognize basic taphonomical processes on animal bones, recognize and distinguish traces on bones: chewing marks, disarticulation and butchering traces, animal bones and horns processing into tools and ornaments and learn to write archaeozoological results and insert it into entire archaeological report.		
2.2. Course enrolment requirements and entry competences required for the course	Completed courses "Anatomy with organogenesis of domestic animals I" and "Anatomy with organogenesis of domestic animals II", finished attendance at course "Anatomy with organogenesis of domestic animals III". The advantage of enrollment will have those students who have passed pre-requisites courses with very good or excellent grade. Maximum number of students: 20		
2.3. Learning outcomes at the level of the programme to which the course contributes	After successful completion of the courses, students will be familiar with the application of basic anatomical science to other professions and scientific disciplines.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following successful completion of the course, students will be able to: define archaeozoology and taphonomy; identify bone elements, taxonomic affiliation, basic pathological changes and taphonomical traces on animal bone remains from the archaeological sites; choose ways of estimation of animals age, sex, withers height and biomass based on its skeletal remains; interpret archaeozoological findings; design archaeozoological analysis to the entire archaeological report from a specific site.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Introduction to archaeozoology (definition and objectives of archaeozoology, historical development and the division of archaeozoology, domestication and its effect to the morphology of the mammal bones); 2. Basics of skeletal system of mammals and birds (complementing knowledge gained from comparative osteology of mammals and birds; determination of skeletal elements and taxonomic affiliation); 3. Laboratory processing of archaeological materials (preparation, marking and preservation of animal bone remains, quantification of samples (MNI, NISP), determining the age and sex, identification of pathological changes in the bones, teeth and horns of animals); 4. Basics of		

	<p>osteometry (measures on the bones, osteometric indices, estimate height and biomass of animals); 5th Taphonomy (definition of taphonomy, identification of taphonomic changes and time of their creation, marks on the bones, bone and horn processing to tools and jewelry); 6. Interpretation of archaeozoological findings in the archaeological report (writing report, bones storage, archiving documents of archaeozoological samples).</p> <p>Lectures: Introduction to archaeozoology (2 hours) The basics of the skeletal system of mammals and birds (2 hours) The basics of the skeletal system of fish and amphibians (3 hours) Primary and secondary archaeozoological analysis (5 hours) Introduction to taphonomy (2 hours) Interpretation of archaeozoological findings (1 hour)</p> <p>Exercises: Determination and quantification of samples (5 hours) Osteometry and osteometric indexes (3 hours) Evaluation of animals age, gender, withers height and biomass (3 hours) Identification of the pathological and taphonomic changes (2 hours) Writing reports, filing of documents (2 hours)</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities	Presence at lectures and exercises, activity in exercises, write a seminar essay, passed preliminary exam and final written exam.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activity	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam			
	Written exam	0,80	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures 3-6 points; attending exercises 8-12 points; participation at exercise 5-10 points; continuous knowledge checking, preliminary exam 20-32 points; seminar essay 12-20 points; final written exam 12-20 points.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	HILLSON, S. (1986): Teeth. Cambridge, Cambridge University Press.					
	HILLSON, S. (1992): Mammal Bones and Teeth: An Introductory Guide to Methods of Identification. Institute of Archaeology, London.					
	O'CONNOR, T. (2000): The archaeology of animal bones. Sutton Publishing Limited, Great Britain.					
	REITZ, E. J., E. S. WING (1999): Zooarchaeology. Cambridge University Press, Cambridge, United Kingdom.					
	SCHMID, E. (1972): Atlas of animal bones for prehistorians, archaeologists and Quaternary geologists. Elsevier Publishing Company, Amsterdam-London-New York.					

2.12. Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> - KUŽIR, S. (2002): Arheozoološko istraživanje kostiju i zubiju životinja badenske kulture s lokaliteta Vučedol. Znanstveni magistarski rad, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb. - KUŽIR, S. (2006): Utjecaj načina uzimanja hrane na morfofunkcionalna svojstva kostiju čeljusnog luka slatkovodnih riba“. Disertacija. Veterinarski fakultet Sveučilišta u Zagrebu. Zagreb. - KUŽIR, S. (2014): Ribe u arheozoologiji. Tafonomija.(Web predavanje, u pripremi). Veterinarski fakultet Sveučilišta u Zagrebu. - TRBOJEVIĆ VUKIČEVIĆ, T. (2002): Osteometrijska analiza arheoloških ostataka dugih kostiju goveda na Vučedolskom kompleksu. Znanstveni magistarski rad, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb. - TRBOJEVIĆ VUKIČEVIĆ, T. (2006): Arheozoološka i tafonomska istraživanja eneolitičkog goveda Vučedola. Disertacija. Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb. - TRBOJEVIĆ VUKIČEVIĆ, T. (2012): Arheozoologija. Mrežno predavanje: http://www.vef.unizg.hr/doc-sec/arheozoologija/arheozoologija.pdf. Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading of active participation in the practical training, one preliminary test, one seminar essay and final written exam.
2.14. Other (as the proposer wishes to add)	

AUTOCHTHONOUS MEAT PRODUCTS

1. GENERAL INFORMATION			
1.1. Course teacher	assoc. prof. Nevijo Zdolec, PhD	1.6. Year of the study programme	V/VI
1.2. Name of the course	Autochthonous Meat Products	1.7. Credits (ECTS)	2
1.3. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, assoc. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	5+15+6
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COURSE DESCRIPTION			
2.1. Course objectives	The subject gives an additional knowledge related to specific parameters of the production of autochthonous meat products. Student will be able to evaluate traditional products, as well as to perform the education of food business operators. This knowledge is applicable in upgrading of traditional production and provides procedures for veterinary inspection of autochthonous production.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of study track "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Upon the completion of the course the student will complement his/her knowledge in obligatory subject Food Hygiene and Technology. The subject shall further clarify specific parameters of the production of autochthonous meat products.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	By the completion of the course students should be able to: - understand the specifics of production of autochthonous meat products - determine microbiological quality of autochthonous meat products, - determine sensory evaluation of autochthonous meat products, - educate the producers of autochthonous meat products - improve the production of autochthonous meat products		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	- Autochthonous production (specific parameters of production, raw materials technology, veterinary control) - Minimal hygienic standards (microbiological standards and control of sanitation) - Ripening of meat products (microbiota of fermented meat products; additives and spices) - Evaluation of products quality (standardisation, sensory features) - Indigenous microbiota of traditional meat products - Plant construction and equipment - Autochthonous meat products of Croatia		

2.6.Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activities during course	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	ACTIVITIES		MINIMAL SCORE		MAXIMAL SCORE	
	Lecture attendance		3		6	
	5 hours of lectures (coefficient: 1,2)		Student must attend 2,5 hours of lectures in order to gain 3 points		5 x 1,2 = 6 points	
	Exercise attendance		4		6	
	6 hours of exercises (coefficient: 1)		student must attend 4 hours of exercises in order to gain 4 points		6 x 1 = 6 points	
	Seminars attendance		4		6	
	15 hours of seminars (coefficient: 0,4)		student must attend 10 hours of seminars in order to gain 4 points		15 x 0,4 = 6 points	
	Activity at exercises and seminars		5		10	
	4 oral questions during exercises (1 points each) 3 oral questions during seminars (1 points each) Seminar presentation (3 points)		5 correct answers on asked questions			

	Continuous knowledge checking	20	32	
	1 written exams, 8 questions 1 question = 4 points	A student must give correct answers to 5 questions in order to gain 20 points	8 correct answers x 4 = 32 points	
	Final exam	24	40	
	Oral exam, 10 questions. 1 question = 4 points	A student must give correct answers to 6 questions in order to gain 24 points	10 correct answers x 4 = 40 points	
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Zdolec, N. (2017): Fermented Meat Products: Health Aspects. CRC Taylor & Francis, SAD		10	pdf
2.12. Optional literature (at the time of submission of study programme proposal)	Professional and scientific papers related to traditional meat products.			
2.13. Quality assurance methods that ensure the acquisition of exit competences	During the course, continuous assessment shall be carried out by means of preliminary test and activities during exercises and seminars.			
2.14. Other (as the proposer wishes to add)				

AUTOCHTHONOUS DAIRY PRODUCTS

1. GENERAL INFORMATION			
1.1. Course teacher	prof. Željka Cvrtila, PhD	1.6. Year of the study programme	5, 6
1.2. Name of the course	Autochthonous Dairy Products	1.7. Credits (ECTS)	2
1.3. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, ass. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	6+13+11
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective subject	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	After completing the course, students will complete the previously acquired knowledge from compulsory subject Food Hygiene and Technology. The course explains in detail the individual parameters in the evaluation of indigenous dairy products. Thus, students will be able to independently assessing and educating producers of local dairy products. Their knowledge is specific and applicable to matters relating to the improvement of indigenous production, veterinary inspection and supervision of production and trade of indigenous dairy products.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of orientation "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Knowing the specifics of hygiene and quality of autochthonous Croatian cheeses.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Know the laws and regulations of local products and the minimum standards of hygiene in milk processing - Explain the characteristics and meaning of autochthonous cheese, cream, butter and fermented dairy products in households in the traditional manner adapted to modern requirements of national and EU legislation - Vary zootechnical and sanitary conditions for the production of the domestic and EU standards - Interpret the results of the chemical analysis and hygienic quality of milk of which the dairy products 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures – 6 hours Indigenous production (production characteristics of indigenous foods, meaning indigenous production environment EU legislation indigenous products, the impact of local products in the promotion of tourism and national cultural characteristics) - 2 hours		

	<p>Minimum standards of hygiene in milk processing (microbiological standards for milk, milk products and the control of the equipment in the indigenous production) - 2 hours</p> <p>The quantity and composition of milk for the indigenous production (economically justified need milk production in indigenous production and the optimum composition of milk according to the purpose for certain products) Facilities and hygiene standards in OPG (zootechnical and sanitary conditions for the indigenous production to domestic and EU standards) - 2 hours</p> <p>Seminars – 13 hours</p> <p>Specifics of the indigenous microflora of dairy products - 2 hours</p> <p>Quality labels: originality, geographical origin and guaranteed traditional specialty in protecting traditional cheese production – 3 hours</p> <p>Traditional production of cream, butter and fermented dairy products - 4 hours</p> <p>Production of the famous Croatian indigenous soft, polutvdih and hard cheese (soft cheese, cottage cheese and sour cream, cooked cheeses, Istria, Dalmatia, island, continental cheeses, etc.) - 4 hours</p> <p>Exercises – 11 hours</p> <p>Milk processing in OPG (optimization of volume and heat treatment of milk (thermization, pasteurization), equipment and machinery-field exercises - 6 hours</p> <p>Quality: originality, geographical origin and traditional specialty guaranteed in the local cheese production. Comparison of sensory properties and process technology – 3 hours</p> <p>Specifics of the indigenous microflora of dairy products. Sanitation on the Farm – 2 hours</p>
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2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures	<input checked="" type="checkbox"/> independent assignments	2.7.Comments:
	<input checked="" type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet	
	<input checked="" type="checkbox"/> exercises	<input checked="" type="checkbox"/> laboratory	
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor	
	<input checked="" type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)	
	<input checked="" type="checkbox"/> field work		

2.8.Student responsibilities	
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2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activities	0,2
	Essay		Seminar essay		(other)	
	Tests	0,6	Oral	0,8	(other)	
	Written exam		Project		(other)	

2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	KOEFIKIJENT	MINIMAL NUMBER OF POINTS	MAXIMUM NUMBER OF POINTS
	Attending lectures	1	3	6
	The total of 6 lecture hours	6:6=1	3:1=3 The student must attend 3 lecture hours	The student must attend 6 lecture

			in order to gain minimal 3 points Each particular lecture hour is summed as 1 point	hours in order to gain maximal 6 points
	Attending exercises	0.55	4	6
	Total of 11 exercise hours	6:11=0.55	4:0.55=7.27 (7) The student must attend 7 exercise hours in order to gain minimal 4 points Each particular exercise hour is summed as 0.55 point	
	Attending at seminars	0.46	4	6
	Total of 13 seminar hours	6:13=0.46	4:0.46=8.69 (9) The student must attend 9 seminar hours in order to gain minimal 4 points Each particular seminar hour is summed as 0.46 point	
	Activity at exercises and seminars		5	10
	Seminare prepared and held = 3 points Oral answers to exercises = 4 points (4x1) Oral answers to seminars= 3 points (3x1)		5:1=5 The student gain minimal 5 points (oral answers at exercises and seminars)	
	Continuous knowledge checking		20	32
			During the course, continuous knowledge will be evaluated by 1 preliminary written exams. The minimal number of points a student must gain is 20 (5 questions). In case a student answers less than 5 questions correctly at a preliminary exam,	

			he/she must retake the preliminary.																
		Final exam		24	40														
				The final exam comprises all results gained from attending lessons. The exam is oral. At the oral exam a student answers 10 questions. One correct answer is worth 4 points. Minimal number of points is 24 and the student must answer correctly minimal 6 questions (24 points).															
		Final evaluation		60	100														
				Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements, according the following table.															
			<table border="1"> <thead> <tr> <th>Points Grade</th> <th></th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>	Points Grade		up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)		
Points Grade																			
up to 59	1 (F)																		
60-68	2 (E)																		
69-76	2 (D)																		
77-84	3 (C)																		
85-92	4 (B)																		
93-100	5 (A)																		
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media														
	Harbutt, J. (2015): World Cheese Book. Dorling Kindersley Limited, London, UK																		
	Bulletin of the Dairy Federation 369/2001. Cheeses in all their Aspects																		

	Ramalho Ribeiro, J. M. C., A. E. M. Horta, C. Mosconi, A. Rosati (2006): Animal products from the Mediterranean area. Wageningen Academic Publishers, Wageningen, NL. (selected papers)		
	Other available literature in the Department		
	Material from lectures		
2.12.Optional literature (at the time of submission of study programme proposal)	Harbutt, J.: Svjetska enciklopedija sira. Naklada Fran, Zagreb, 2000 Kozačinski, L., V. Dobranić, I. Filipović, N. Zdolec, B. Njari, Ž. Cvrtila Fleck, B. Mioković (2015): Laboratorijske vježbe iz higijene i tehnologije hrane. Filipović, I. i V. Dobranić (ur.). Veterinarski fakultet Sveučilišta u Zagrebu; INTERGRAFIKA. Udžbenici Sveučilišta u Zagrebu Tratnik, Lj. (1998): Mlijeko – tehnologija, biokemija i mikrobiologija. Udžbenik Sveučilišta u Zagrebu. Hrvatska mljekarska udruga. Zagreb		
2.13.Quality assurance methods that ensure the acquisition of exit competences			
2.14.Other (as the proposer wishes to add)			

BIOLOGY AND CONSERVATION OF MARINE MAMMALS

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Tomislav Gomerčić	1.6. Year of the study programme	2nd
1.2. Name of the course	Biology and Conservation of Marine Mammals	1.7. Credits (ECTS)	2.5
1.3. Associate teachers	Assoc. Prof. Martina Đuras, Kim Korpes, DVM, Magdalena Kolenc, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	10L + 16P + 10S + 4 e-learning S
1.4. Study programme (undergraduate, graduate, integrated)	Integrated study	1.9. Expected enrolment in the course	30
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	10%
2. COUSE DESCRIPTION			
2.1. Course objectives	The goal of this course is to provide the students with knowledge that is fundamental for understanding the biology of marine mammals and conservations measurements for this endangered species. Veterinarians are important participants of national surveillance programs where knowledge on the morphology, physiology and ecology of these animals is acquired.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following the completion of the course the student will be able : <ol style="list-style-type: none"> 1. to identify and list marine mammals 2. to explain the differences of terrestrial and marine mammals 3. to list and explain anatomical and physiological adaptations of mammals to the aquatic life 4. to list and explain scientific methods in marine mammal research 5. to act according to the legal acts of marine mammal conservation and the national <i>Protocol for reporting of injured/sick or dead protected sea animals</i> 6. to design and propose a community engaged project in the field of marine mammal conservation 		
2.5. Course content broken down in detail	Course content: <ol style="list-style-type: none"> 1. Systematic and evolution of marine mammals (Ceatacea ,Pinnipedia, Sirenia). 		

by weekly class schedule (syllabus)	<p>2. Habitat differences of terrestrial and marine mammals. 3. Physiological adaptations of mammals to the aquatic life 4. Functional morphology of marine mammals 5. Research, status and conservation of marine mammals in the Adriatic Sea Community engaged learning in marine mammal conservation.</p>					
2.6.Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities	Students are obliged to attend the classes and to complete a seminar.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	YES	Research		Practical training	YES
	Experimental work		Report		activity (other)	
	Essay		Seminar essay	YES	(other)	
	Tests		Oral exam	YES	(other)	
	Written exam	YES	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	-					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Mazzariol, S., B. Cozzi, C. Centelleghè (2015): Handbook for Cetaceans' Strandings. Massimo Valdina, Milano.				YES	LMS
	Martina Đuras, Darinka Škrtić, Tomislav Gomerčić: Collection of morphological specimen of endangered species. Faculty of Veterinary Medicine University of Zagreb.					http://www.vef.hr/dolphins/anatomija_duplina/
2.12.Optional literature (at the time of submission of study programme proposal)	Published scientific and professional articles on the research of marine mammals in the Adriatic Sea (http://intranet.vef.hr/dolphins/radovi/popis.htm)					
2.13.Quality assurance methods that ensure the acquisition of exit competences						

2.14.Other (as the proposer wishes to add)	
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BIOLOGY AND ECOLOGY OF PREDATORS

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Josip Kusak	1.6. Year of the study programme	The second year
1.2. Name of the course	Biology and Ecology of Predators	1.7. Credits (ECTS)	2
1.3. Associate teachers	Assoc. Prof Tomislav Gomerčić, Assist. Prof Magda Sindičić	1.8. Type of instruction (number of hours L + S + E + e-learning)	L=8; S=4; E=18
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate studies	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20% (six hours e-learning lectures and two hours of direct lectures)
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The aim is to give students the right perspective of ecological role of organisms that are on the top of food pyramid, including their evolution and existence in the balance with the prey species. The course is a specific extension of the course «Zoology», and specifically of the section «basic ecology».</p> <p>The goal is to make clear to students that predators have their ecological role in keeping the ecosystem in balance. Humans are also close to the top of food chain, and they do interfere with predators through direct competition resulting in extermination of many predator populations. In addition to Carnivores (bear, wolf, lynx), analyzed are sea mammals, birds of prey, and carnivorous fishes. Understanding of mutual relation of predators and their prey, population dynamics and size regulation, and role for humans is useful for modern veterinarian.</p>		
2.2. Course enrolment requirements and entry competences required for the course	The subject Biology and ecology of predators is at the second year of the Veterinary medicine study. Requirements for enrolment are that students have completed the subject Zoology and can use English by speaking and writing it.		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - recognizing predation at different trophic levels - knowing biological features of predatory species 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - evaluate the possibilities of research in captivity - explain that predators may be the objects of hunting, but also as pet animals - understand interactions of predators and prey by the use of simulation models of food chains - understand the value of large carnivores for the stability and diversity of ecosystems 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Status and importance of organisms at the top of food pyramid. Mechanisms of population size regulation; 2. Large predators of Croatia: Carnivora: bears, wolf, lynx, and Mediterranean monk seal: Cetacea: dolphins; Birds of prey, Reptiles; Amphibians, Fresh water and marine predatory fish, Invertebrate predators: Insects, Echinodermata, 3. Study of brown bears in Croatia: status and characteristics of Croatian population. 4. Study of wolves in Croatia: status and characteristics of Croatian population. 5. Study of lynxes in Croatia: status and characteristics of Croatian population. 6. Methods of studies of large carnivores:</p>		

	study ex-situ and in-situ, methods of capturing, handling, marking, sampling and tracking. Use of radio-telemetry. Practical work in the Zoo and in the field.					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor (in the case of having less than ten students enrolled) <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities	Attending lectures, seminar and field work. Preparing, presenting and defending one seminar.					
2.9. Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	0.2	Research		Practical training	
	Experimental work		Report		Activity (other)	0.2
	Essay		Seminar essay	1.0	(other)	
	Tests		Oral exam	0.6	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	During the course, students do participate discussing presented and other related examples. They prepare a seminar paper, which is orally presented and graded. Continuous knowledge checking and an exam in form of oral presentation of prepared seminar.					
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library		Availability via other media	
	All study material available in Power point format				Files on LMS	
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Odum, E. (1988): Fundamentals of ecology, USA.</p> <p>Jedrzejewski, W. and B. Jedrzejewska (1998). <u>Predation in vertebrate communities. The Białowieża Primeval Forest as a case study.</u> Berlin, Springer-Verlag, 450 str.</p> <p>Melis, Claudia, Bogumiła Jedrzejewska, Marco Apollonio Kamil A. Barton, Włodzimierz Jedrzejewski, John D.C. Linnell, Ilpo Kojola, Josip Kusak, Miha Adamic, Simone Ciuti, Ivan Delehan, Ihor Dykyy, Krešimir Krapinec, Luca Mattioli, Andrey Sagaydak, Nikolay Samchuk, Krzysztof Schmidt, Maryna Shkvyrya, Vadim E. Sidorovich, Bernadetta Zawadzka and Sergey Zhyla, 2009. Predation has a greater impact in less productive environments: variation in roe deer, <i>Capreolus capreolus</i>, population density across Europe. <i>Global Ecology and Biogeography</i> 18: 724–734.</p>					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Attendance to classes, seminar work and exam.					
2.14. Other (as the proposer wishes to add)						

BREEDING AND HUSBANDRY OF RABBITS AND FURBEARERS

1. GENERAL INFORMATION			
1.1. Course teacher	Ekert Kabalin Anamaria, PhD, Full Professor	1.6. Year of the study programme	3rd
1.2. Name of the course	Breeding and Husbandry of Rabbits and Furbearers	1.7. Credits (ECTS)	2
1.3. Associate teachers	Velimir Sušić, PhD, Full Professor Sven Menčik, PhD, Assistant Professor Maja Maurić, PhD, Assistant Professor Ivan Vlahek, VMD	1.8. Type of instruction (number of hours L + S + E + e-learning)	3L + 2E + 25S (as e-learning)
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	-
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction	2, 80%
2. COUSE DESCRIPTION			
2.1. Course objectives	Getting knowledge necessary for identification of certain rabbit breeds, as well as types of furbearing animals and cage pets. Adoption of fact about uses of rabbits and furbearers, exhibitions, methods and systems of breeding. Getting theoretical and practical skills necessary for animal handling and treating. Adoption of basic of genetics in the fur production, the basics of making business and investment plan with respect to the possibility of placing products on the market.		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	Acquiring knowledge about certain breeds of rabbits and types of furbearing animals and cage pets, methods of breeding for production purposes or as pets, handling and treatment of animals (breeding, offspring handling, marking, grading on exhibitions, recognition of disease, etc).		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully completion of the course students will be able to: explain the difference between rabbit and hare, as well as main characteristics of furbearers and cage pets identify the category and breed of rabbits and type of fur-animals or cage pets learn how to handle and treat animals apply their knowledge in breeding of cage pets (rabbit, mouse, rat, guinea pig, hamster, chinchilla, degu) organize farm production assess the effectiveness of rabbit meat production		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	Methodological unit / course content		class schedule (lectures + exercises + seminars + e-learning)			
	Introduction to the production of rabbits and fur animals (Production in the Republic of Croatia and the world. Products and other uses of rabbits.)		0,5 L + 2 S(e-learning)			
	Origin and breeds of rabbits (Large, midsize and small (toy) breeds of normal fur. Long-haired and short-haired breeds of rabbits. Hybrids. Choosing a breed for specific orientation of the production.)		0,5 L + 2 S (e-learning)			
	Farming systems (Housing, necessary equipment and tools. Acquisition breeding material.)		4 S(e-learning)			
	Breeding rabbits (Breeding methods. Handling with young animals. Fattening of rabbits. Principles of genetics for fur production. Marking rabbits. Keeping records of breeding.)		0,5 E + 4 S(e-learning)			
	The plan of supply and demands on the market (Orientation of production with respect to the needs of the market. Basics of business and investment plan. Placement of the products. Competitiveness on the domestic market.) Rabbit as a pet and a model for research in biomedicine. Exhibitions.		4 S(e-learning)			
	Production and breeding of Chinchillas (Chinchilla origin and types. Principles of genetics in the inheritance of coat color. Systems of breeding and production. Economical production.)		0,5 L + 0,5 E+ 2 S(e-learning)			
	Production and breeding of Mink (Origin and types of Mink. Farming systems and production.)		0,5 L + 0,5 E + 2 S(e-learning)			
	Production and breeding of Nutria (Origin and types of Nutria. Systems of breeding and production.)		0,5 L + 2 S(e-learning)			
	Breeding of different cage-pets (rabbit, mouse, rat, guinea pig, hamster, chinchilla, degu)		0,5 L + 0,5 E + 3 S(e-learning)			
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Student obligations are defined with the Regulations on the integrated undergraduate and graduate study of veterinary medicine. Students are required to attend classes (according to the mentioned Regulation) and prepare seminar before taking the final (written) exam.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,1	Research		Practical training	
	Experimental work		Report		Activity	0,1
	Essay		Seminar essay	0,3	(other)	
	Tests		Oral exam		(other)	
	Written exam	0,5	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Writing and submitting of seminar before taking final (written) exam. Students can achieve a maximum of 50 points from final exam. The final grade is based on obtained points.					

	Points	Grade	
	< 30	1 – F	
	31 – 34	2 – E	
	34,5 – 38	2 – D	
	38,5 – 42	3 – C	
	42,5 – 46	4 – E	
	46,5 – 50	5 – A	
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	McNitt, J. I., N. M. Patton, P. R. Cheeke, S. D. Lukefahr (2000): Rabbit Production. Interstate Publishers, Inc. Danville, Illinois.	1 book in Department library	no
	web pages about breeding of rabbits, furbearers and different types of cage pets		yes
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Students' work will be monitored through conversations (on lectures, exercises, and their online activity via LMS (on seminars). At the end of teaching the knowledge of students will be verified by a final (written) exam.		
2.14. Other (as the proposer wishes to add)			

CARCASS QUALITY AT THE SLAUGHTER LINE

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Željka Cvrtila, PhD	1.6. Year of the study programme	5, 6
1.2. Name of the course	Carcass Quality at the Slaughter Line	1.7. Credits (ECTS)	2
1.3. Associate teachers	prof. Lidija Kozačinski, PhD prof. Željka Cvrtila, PhD assist. prof. Nevijo Zdolec, PhD Tomislav Mikuš, PhD Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	8+ 10 + 8
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective subject	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	After audit of the course, student will complete one's own already acquired knowledge of the obligatory subject Food Hygiene and Technology. The subject describes in details the individual parameters of quality evaluation of the slaughterhouse-processed carcasses according to meat yield. Thus, the students will acquire basic knowledge, which they will be able to use when attending a licensed course with the Ministry of Agriculture and Forestry for graders (classifiers) of carcass quality after slaughtering processing. The acquired knowledge is specific and applicable in activities performed by licensed graders (classifiers) of carcass quality after slaughtering processing.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of orientation "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Knowing the specifics of meat quality at slaughter within the activities of veterinary public health and food safety.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - interpret assessment procedures and evaluation of carcasses - explain the grade of beef, pig and sheep carcasses after slaughter process - know the score and calculate the yield of meat ("leanness") to the trimmed carcasses of pigs and know the evaluation of the quality of beef and sheep carcasses - distinguish between objectives and tasks of evaluation quality carcass 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures 14 <ul style="list-style-type: none"> • Aims and tasks of evaluation of quality of the slaughterhouse-processed carcasses (Reasons for need of quality evaluation of the processed carcasses). - 2 h 		

	<ul style="list-style-type: none"> • Procedures of evaluation of carcasses, development of procedures, and world and national legal regulations (Historical review of the carcass evaluation and legal provisions). 3 h • Evaluation of cattle carcasses after slaughtering processing -2 h • Evaluation of pig carcasses after slaughtering processing -2 h • Development of quality evaluation of the slaughterhouse-processed animals (Perspectives of development of quality evaluation according to meat yield in domestic animals). – 3 h <p>Excercises 2</p> <ul style="list-style-type: none"> • Evaluation and calculation of meat yield ("meatiness") of the processed hog carcasses (Procedures that make a constituent part of the hog carcass evaluation after slaughtering processing, in particular, mathematical models).- 2 h <p>Seminars 10</p> <ul style="list-style-type: none"> • Evaluation of cattle carcasses after slaughtering processing (Procedures that make a constituent part of the cattle carcass evaluation). -4 h • Evaluation of pig carcasses after slaughtering processing (Procedures that make a constituent part of the pig carcass evaluation).- 4 h • Evaluation of sheeps and goats carcasses after slaughtering processing (Procedures that make a constituent part of the cattle carcass evaluation). -2 h 					
2.6.Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	x independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities	Students are required to attend all forms of teaching the subject.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research		Practical training	
	Experimental work		Report		Activities	0.2
	Essay		Seminar essay		(other)	
	Tests	0.64	Oral	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	KOEFICIJE NT	MINIMAL NUMBER OF POINTS	MAXIMUM NUMBER OF POINTS		
	Attending lectures	0,43	3	6		
	The total of 14 lecture hours	6:14=0,43	3:0,43=6,97 The student must attend 7 lecture hours in order to gain minimal 3 points	The student must attend 14 lecture hours in order to gain maximal 6 points		

			Each particular lecture hour is summed as 0,43 point	
	Attending exercises	3	4	6
	Total of 2 exercise hours	6:2=3	4:3=1.33 (1) The student must attend 1 exercise hours in order to gain minimal 4 points Each particular exercise hour is summed as 1.33 point	
	Attending at seminars	0.6	4	6
	Total of 10 seminar hours	6:10=0.6	4:0.6=6.67 (7) The student must attend 7 seminar hours in order to gain minimal 4 points Each particular seminar hour is summed as 0.6 point	
	Activity at exercises and seminars		5	10
	Seminare prepared and held = 3 points Oral answers to exercises = 4 points (4x1) Oral answers to seminars= 3 points (3x1)		5:1=5 The student gain minimal 5 points (oral answers at exercises and seminars)	
	Continuous knowledge checking		20	32
		During the course, continuous knowledge will be evaluated by 1 preliminary written exams. The minimal number of points a student		

			must gain is 20 (5 questions). In case a student answers less than 5 questions correctly at a preliminary exam, he/she must retake the preliminary.														
	Final exam		24	40													
			The final exam comprises all results gained from attending lessons. The exam is oral. At the oral exam a student answers 10 questions. One correct answer is worth 4 points. Minimal number of points is 24 and the student must answer correctly minimal 6 questions (24 points).														
	Final evaluation		60	100													
			Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements, according the following table.														
		<table border="1"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>	Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)	
Points	Grade																
up to 59	1 (F)																
60-68	2 (E)																
69-76	2 (D)																
77-84	3 (C)																
85-92	4 (B)																
93-100	5 (A)																

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	Whittemore, C. T., I. Kyriazakis (2006): Whittemore's Science and Practice of Pig Production. Blackwell Publishing Ltd, UK.		
	Lazzaroni, C., S. Gigli and D. Gabiña (2007): Evaluation of carcass and meat quality in cattle and sheep. Wageningen Academic Publishers, Wageningen, The Netherlands		
	Material and notes from the lectures		
	Regulations governing the determination of the quality of these categories and classes and half carcasses		
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

CHEMISTRY OF NATURAL COMPOUNDS

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof Luka Krstulović	1.6. Year of the study programme	1-6
1.2. Name of the course	Chemistry of Natural Compounds	1.7. Credits (ECTS)	2
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	L-15+S-9+E-6
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Chemistry of natural compounds deals with groups of organic compounds which were only partially described in the Medical chemistry course. The objective of this course is to expand student's knowledge on basic organic chemistry which is needed for attending and understanding Biochemistry in Veterinary Medicine, Physiology of Domestic Animals and other courses during the Veterinary medicine studies, which demand knowledge of structure and chemistry of biologically important chemical compounds. Knowledge of important natural compounds their actions and biosynthesis will allow easier comprehension of the chemical changes that occur in animal and plant organisms.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>Learning outcomes at the level of the programme:</p> <p>Understanding the basic science on which veterinary medicine is based</p> <p>Research: the ability to search the literature, databases and other information sources, the ability to design and conduct experiments in the field of veterinary medicine, to interpret results and draw conclusions and the ability of use laboratory equipment and make critical analysis of test results</p> <p>Practical skills: the ability of consolidation of the theoretical knowledge and practical skills within the fields of veterinary medicine</p> <p>Complementary skills: the ability to conduct independent research and work in a team, the ability of presenting the results – oral and in writing</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Learning outcomes at the level of the course:</p> <p>Ater successful completion of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. differentiate main groups of natural compounds – secondary metabolites; 2. compare the structure and action of secondary metabolites; 3. compare biosynthetic and laboratory formation of important natural compounds; 4. independently use methods for the extraction of compounds from natural sources; 5. propose method for the separation of compounds based on their properties. 		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	Definition and differentiation of secondary metabolites. Biosynthesis, laboratory synthesis, properties and action of natural compounds: vitamins, terpenes, carbohydrates, steroids, alkaloids. Methods for separation and identification of natural compounds, examples of laboratory and industrial synthesis, application in human and veterinary medicine. Isolation of caffeine. Preparation and analysis of infusions.					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	1. attending lectures 2. attending exercises 3. participation at exercises					
2.9. Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	0.36	Research		Practical training	
	Experimental work	0.2	Report		Activity	0.64
	Essay		Seminar essay		(other)	
	Tests		Oral exam		(other)	
	Written exam	0.8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Students have to write an essay. Subject of the essay will be agreed with the Course leader. The final grade is the sum of points from the laboratory exercise and the essay.					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	M. M. Bloomfield. Chemistry and the living organism, Wiley and sons, New York			1	No	
	Chemistry of Natural Compounds, materials for laboratory exercises			1	Yes	
2.12. Optional literature (at the time of submission of study programme proposal)	A. E. Osbourn, V. Lanzotti, Plant-derived Natural Products Synthesis, Function, and Application, Springer, London. R. Cooper, G. Nicola Natural Products Chemistry: Sources, Separations, and Structures, CRC Press Taylor & Francis Group, London. T. Aniszewski, Alkaloids – Secrets of life, Elsevier, Amsterdam.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Student survey					
2.14. Other (as the proposer wishes to add)						

CLINICAL PHYSIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Jasna Aladrović, DVM	1.6. Year of the study programme	4
1.2. Name of the course	Clinical Physiology	1.7. Credits (ECTS)	2
1.3. Associate teachers	assist. prof. Lana Pađen, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	15L+ 15E
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	10
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The aim of the course is to prepare students for clinical diagnosis by referring them to research and laboratory procedures that are tailored to specific production cycle and mode of exploitation of production animals. Clinical Physiology gives students an insight into the importance of determining reference intervals of hematological and biochemical parameters in a representative sample and factors that could affect the information contained herein. It instructs students on the importance of clinical enzymology associated with a particular physiological status such as intensive growth and fattening, pregnancy, lactation, and other specific production circumstances.</p> <p>Lectures direct the student to connect the physiological concepts and introduce them to the methodology of scientific research. The organism is seen as a system and physiology is interpreted as systemic clinical physiology.</p> <p>Exercises are used for better understanding of laboratory procedures in the sampling, processing and analytics. Students develop independence in interpreting the results of hemograms and biochemical analyses.</p>		
2.2. Course enrolment requirements and entry competences required for the course	Attended lectures of Physiology of Domestic Animals I and II		
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>Ability to consolidate theoretical knowledge and practical skills in preclinical veterinary medicine related to certain physiological status of animals: growth and fattening, pregnancy, lactation.</p> <p>Understanding of applied techniques and diagnostic procedures in determining the health status of animals in various production cycles.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Apprehension of physiological processes taking place during animal production.</p> <p>Determining laboratory tests of choice for application during specific production cycles and different breeding methods.</p> <p>Sampling techniques for obtaining various samples for animal health management.</p>		

	Practical experience in laboratory analyses.					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<ol style="list-style-type: none"> 1. Intracellular regulation, communication within and between cells. 2. Homeostatic mechanisms during growth, gravidity, lactation, milk, meat and egg production. 3. Neuroendocrine regulation, interaction between nervous and hormonal system, stimulation and inhibition. 4. Enzymatic regulation. 5. Mechanisms of stimulation and inhibition of enzymatic reactions. 6. Metabolic status. 7. Alterations of metabolic pathways. 8. Biomarkers of oxidative stress. 9. Oxidation and antioxidative reactions. 10. Production and function of reactive oxygen and nitrogen metabolites, macromolecular damage and its repair. 11. Assessment of organ systems metabolism: bones, heart, kidney, liver, udder, muscles. 12. Metabolic profile and enzymes in specific physiological processes. 					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Students are obligated to attend all forms of instructions. They are expected to prepare a seminar, independently, with teachers' instructions. During exercises students individually perform hematological and biochemical blood tests.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,3	Research		Practical training	0,6
	Experimental work		Report		(other)	
	Essay		Seminar essay	0,3	(other)	
	Tests	0,3	Oral exam	0,5	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	The student performs oral test during the classes, and upon finishing each chapter of syllabus. Final exam is also oral.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Feldmen, B. F., J. G. Zinkl, N. M. Jain: Shalm's Veterinary Hematology. Fifth edition, Ed. Lippincott Williams & Wilkins, A. Wolters Kluwers Companz, 2000.				1	
	Kaneko, J. J., J. W. Harvey, M. L. Bruss: Clinical Biochemistry of Domestic Animals. Fifth edition, Ed. Academic Press. San Diego, London, Boston, New York, Sydney, Tokyo, Toronto 1997.				1	
	Keer, M. G. (2004): Veterinary Laboratory Medicine. 2 nd edition, Elsevier, Mosby				1	
2.12. Optional literature (at the time of submission of study	Payne, J. M., S. Payne: The metabolic profile test. Oxford University Press. Oxford-New York-Tokyo, 1987. Halliwell, B., J. M. C. Gutteridge (1999): Free radicals in biology and medicine. 3 rd edition. Oxford University Press. Oxford.					

programme proposal)	Feldman, E. C., R. W. Nelson, C. Reusch J. C. Scott-Moncrieff, E. N. Behrend (2015): Canine and Feline Endocrinology, 4th Edition, Elsevier Saunders SAD.
2.13. Quality assurance methods that ensure the acquisition of exit competences	Students anonymous poll
2.14. Other (as the proposer wishes to add)	

COMPARATIVE ODONTOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc Prof. Dean Konjević, Dipl. ECZM	1.6. Year of the study programme	5
1.2. Name of the course	Comparative Odontology	1.7. Credits (ECTS)	1
1.3. Associate teachers	Prof. Zdravko Janicki	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+0+5
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of these lectures and seminars is to fulfil the student's knowledge in the field of comparative odontology and to form experts capable for prevention of dental pathologies and for adequate and reliable age estimation, as a part of management and population research.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ol style="list-style-type: none"> 1. to upgrade and stimulate critical evaluation of the observed changes on the animal teeth and their causes 2. to fulfil previously acquired knowledge on age estimation 3. to improve wildlife conservation and creation of management plans 4. to improve knowledge on characteristics of animal bites 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol style="list-style-type: none"> 1. acquire knowledge on characteristics of shape and structure of fish, amphibian, reptile and wild mammal dentition. 2. ability to identify animal at the level of family according to the characteristics of teeth 3. ability to understand feeding related characteristics of the teeth and evolutionary adaptation 4. ability to recognize and reconstruct dental pathologies 5. ability to implement knowledge on different methods of age evaluation 6. to understand growth and reparation characteristics of permanently growing teeth 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures (10) <ol style="list-style-type: none"> 1. Evolution and morphology of teeth of animals 2. Function and replacement of teeth 3. Characteristics of fish dentition 4. Characteristics of amphibian dentition 5. Characteristics of reptile dentition 6. Characteristics of mammal dentition I – monotremes, marsupials, cetacea 7. Characteristics of mammal dentition II – carnivores, herbivores, omnivores 		

	8. Characteristics and pathology of teeth of permanent growth 9. Dental pathology 10. Age evaluation according to teeth characteristics Exercises (5) 1. Bite characteristics – force, additional impacts 2. Trends in mammalian dentition - relation between phylogenetic position and tooth development 3. Recognizing animal dentition and extracted teeth, skull inspection and recording the observed characteristics 4. Dental pathology 5. Tooth based age evaluation in animals – dental wear, tooth sections					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments: If possible, a visit to skull collection of Croatian Natural History Museum is anticipated.			
2.8.Student responsibilities						
2.9.Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	0.18	Research		Practical training, activity	0.10
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	0.3	Oral exam	0.40	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Class attendance: 20% (attendance at lectures – 13.3%, seminars - 2.7%, exercises – 4%) Exercise activity (participation in the discussion): 30% of grade Seminar (preparation, presentation, participation in discussion; instructions will be given at class): 10% of grade Oral exam: 40% of grade					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	1. Miles, A. E. W., C. Grigson (1990): Colyer's variations and diseases of the teeth of animals, revised edn. Cambridge University Press, Cambridge				Department Library - 1	0
2.12.Optional literature (at the time of submission of study programme proposal)	1. Verstraete, F. J. M. (1999): Self assesment colour review of veterinary dentistry. Manson Publishing/The Veterinary Press, London 2. Wagenknecht, E. (1984): Alters-bestimmung des Erlegten Wildes. Neumann-Neudamm, Melsungen					

	3. Pindborg, J. J. (1970): Pathology of the dental hard tissues. Munskgaard, Copenhagen
2.13. Quality assurance methods that ensure the acquisition of exit competences	Oral exam.
2.14. Other (as the proposer wishes to add)	

COMPARATIVE ANATOMY OF SKELETAL SYSTEM

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Tajana Trbojević Vukičević	1.6. Year of the study programme	Second year, third semester
1.2. Name of the course	Comparative Anatomy of Skeletal System	1.7. Credits (ECTS)	2
1.3. Associate teachers	Associate Prof. Snježana Kužir; Kim Korpes, dr. med. vet.; Magdalena Kolenc, dr. med. vet	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+0+20
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1. level (application of VEF-LMS)
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will complete knowledge of comparative morphology, identify osteological features of thoracic and pelvic limb bones of wildlife animals, differentiate bone elements, and morphologically compare the bones of thoracic and pelvic limb of the game.		
2.2. Course enrolment requirements and entry competences required for the course	Completed courses "Anatomy with organogenesis of domestic animals I" and "Anatomy with organogenesis of domestic animals II". Maximum number of students: 20		
2.3. Learning outcomes at the level of the programme to which the course contributes	After successful completion of the courses, students will be able to apply acquired knowledge during the courses primarily associated with hunting, but also some preclinical subjects such as pathology and pathological morphology.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following successful completion of the course, students will be able to: repeat the basic features of the bones of thoracic and pelvic limbs of animals; identify macromorphological features of thoracic and pelvic limbs bones of red deer, roe deer, wild boar, wolf, fox, hare and brown bear; differentiate the morphologic characteristics of limb bones of animals; compare the bones of thoracic and pelvic limbs of domestic animals and wildlife.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1. Basic features of thoracic limb bones of animals: red deer, roe deer, wild boar, wolf, fox, hare, brown bear. 2. Basic features of the pelvic limb girdle bones of animals: red deer, roe deer, wild boar, wolf, fox, hare, brown bear. 3. Basic features of the pelvic limb bones of animals: red deer, roe deer, wild boar, wolf, fox, hare, brown bear</p> <p>Lectures: Basic features of thoracic limb bones of animals: red deer, roe deer, wild boar, wolf, fox, hare, brown bear (5 hours); Basic features of the pelvic limb bones of animals: red deer, roe deer, wild boar, wolf, fox, hare, brown bear (5 hours);</p> <p>Exercises: Basic features of zoonopodium (scapula, clavícula) of animals thoracic limb (2 hours) Basic features of stylopodium (humerus) and zeugopodium (ossa antebrachii) of</p>		

	animals thoracic limb (3 hours) Basic features of zonopodium (os coxae) of animals pelvic limb (2 hours) Basic features of stylopodium (os femoris) and zeugopodium (ossa cruris) of animals pelvic limb (3 hours) Basic features of autopodium (basipodium, metapodium and acropodium) of thoracic and pelvic limb (5 hours)			
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:	
2.8. Student responsibilities	Presence at lectures and exercises. Activity in exercises. Passed preliminary exam and final oral exam.			
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research	Practical training
	Experimental work		Report	Activity 0,2
	Essay		Seminar essay	(other)
	Tests	0,64	Oral exam	0,8 (other)
	Written exam		Project	(other)
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures 3-6 points; attending exercises 8-12 points; participation at exercise 5-10 points; continuous knowledge checking, preliminary exam 20-32 points; final, oral exam 24-40 points.			
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	HILLSON, S. (1992): Mammal Bones and Teeth: An Introductory Guide to Methods of Identification. Institute of Archaeology, London.			
	KÖNIG, H. E., H.-G. LIEBICH (2007): Veterinary anatomy of domestic mammals, Textbook and colour atlas. 3 rd Ed. Schattauer, Stuttgart, New York.			
	SCHMID, E. (1972): Atlas of animal bones for prehistorians, archaeologists and Quaternary geologists. Elsevier Publishing Company, Amsterdam-London-New York.			
2.12. Optional literature (at the time of submission of study programme proposal)	BABIĆ, K., D. MIHELIĆ. T. TRBOJEVIĆ VUKIČEVIĆ (2002): Komparativna anatomija koštanog sustava sisavaca i ptica. Skripta za internu upotrebu, Veterinarski fakultet Sveučilišta u Zagrebu, Zagreb. NICKEL, R., A. SCHUMMER, E. SEIFERLE (1986): The Anatomy of the Domestic Animals. Vol. 1: The Locomotor System of the Domestic Mammals, Verlag Paul Parey, Berlin-Hamburg.			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading of active participation in the practical training, one preliminary tests and final oral exam.			
2.14. Other (as the proposer wishes to add)				

COMPARATIVE MUCOSAL IMMUNOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Maja Popović	1.6. Year of the study programme	3
1.2. Name of the course	Comparative Mucosal Immunology	1.7. Credits (ECTS)	2
1.3. Associate teachers	Full Prof. Ksenija Vlahović	1.8. Type of instruction (number of hours L + S + E + e-learning)	15+5+10
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be able to recognize and understand the basic principles of mucosal immunology within veterinary medicine and public health.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ol style="list-style-type: none"> 1. Identify and define the meaning of mucosal immunology in the context of veterinary medicine and public health. 2. Define, describe and interpret the development and affiliation specific mucosal immunity in animals of veterinary interest. 3. Allocate the necessary knowledge to demonstrate the use of cellular and molecular methods for evaluating the protective ability of mucosal immunity in domestic animals. 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol style="list-style-type: none"> 1. Consider the meaning of mucosal immunology in the context of veterinary medicine and public health. 2. Connect content objects with prior knowledge of basic veterinary immunology, and critical set in the evaluation of future knowledge gained from internal and infectious diseases. 3. Distinguish development and special affiliation mucosal immunity in animals of veterinary interest. 4. Identify opportunities and achievements of cellular and molecular methods for the evaluation of protective mucosal immunity ability. 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<ol style="list-style-type: none"> 1. Immunobiology mucosa (Mucous historical aspects of immunology. Structure and function of mucosal barrier. Histochemistry and topography characteristics of mucosal immune system (MIS). Nonspecific and specific defense mucosal surfaces. Differentiation, resignification and homing of immune cells of lymphatic tissue of the mucous membranes. Immunoglobulins mucosa. Cytokines mucosa. Adhesion molecules mucosal lymphocytes. Interactions of epithelial and immune cells of the mucous membranes. Induction and regulation of mucosal immune responses. Adhesion of bacteria to mucosal surfaces. Immunity and infection of the mucosa membranes. Oral tolerance. Immunodeficiency and mucosal immunity. Allergic response of the MIS.). 2. Ontogenesis and phylogenesis mucosal immunity (Prenatal and postnatal systemic and local immunization. Nonspecific and specific manipulation of the MIS. Stress as exogenous and endogenous modulator of mucosal immunity). 3. Mucosal immunomodulation (Ontogeny of mucosal immunity. Phylogenetic development of the MIS). 		

	4. Methods for evaluation of mucosa immunocompetence.					
2.6. Format of instruction:	lectures		independent assignments		. Comments:	
	seminars and workshops		multimedia and the internet			
	exercises		laboratory			
	on line in entirety		work with mentor			
	partial e-learning		(other)			
	field work					
2.8. Student responsibilities	Attending lectures, seminar and lab exercises. Preparing for lab from materials on LMS. Preparing, presenting and defending one seminar.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		activity (other)	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	<p>During the session of the “Comparative mucosal immunology” course a student must attend 8 hours of lectures in order to gain 3 minimal points. The maximal number of points gained from this evaluation element is 6 points. During the session of the “Comparative mucosal immunology” course a student must attend 3 hours of seminars in order to gain 4 minimal points during the semester. The maximal number of points gained from this evaluation element is 6 points. During the session a student must attend 6 hours of practices in order to gain 4 minimal points during the semester. The maximal number of points gained from this evaluation element is 6 points. During the session at the time of seminars and practices the student must solve specified problems from 5 seminar lessons and 10 exercise lessons, and he/she gains the lecturer’s signature for that. Each correctly done and signed seminar or exercise lesson is worth 2 point. At seminars and exercises a student can gain the total of 30 points. For preparation of a seminar work during seminar lessons the student earns 5 additional points. During the session a student must gain the total of 20 points in order to earn minimal 5 points. The maximal number of points gained from this evaluation element is 10. During the session seven preliminary exams will be organized at the time of exercises. During rounds will be organized one colloquium at the time of exercise of the 35 tasks or questions . Each correctly answered question or task is worth 1 point. Within this element it is possible to achieve a maximum of 35 points. From student must achieve 22 points in order to achieve a minimum of 20 points. A student who does not gain minimal 22 points from preliminary exams during the session, has a right to a makeup preliminary exam containing teaching material from all programme exercises, which will be organized upon completion of the lessons in that session. The total number of points at the preliminary exam is 35. A student who passes the makeup preliminary exam with more than 50 % correct answers has right to take the final exam. The minimal conditions for passing at the first, second, third, fourth and five evaluation elements will be summed up and they will be worth a total of 36 points. In order to take the final exam a student should gain the stated 36 points. The final exam starts with a student’s short analysis of results gained from the five types of activities of continuous knowledge checking. Questions in the final exam will be put in a way that a student can answer in writing. The maximum number of points that can be gained from the final exam is 60 points. A student must show at least a sufficient knowledge at the final exam regardless of gained number of points from the first five evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 36 in order to gain minimal number of 24 points. In case a student does not satisfy at the final part of the exam, the lecturer determines time for re-examination. Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis</p>					

	<p>of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all six evaluation elements, according the following table. The final mark is expressed in terms of quantity by a numeric value and by a grade in accordance with points value, from 1 to 5. Student who didn't succesfully master the course programme is marked by 1. Mark 1 stands for insufficient achievement.</p> <table border="1" data-bbox="459 376 1294 663"> <thead> <tr> <th><i>Points</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>			<i>Points</i>	<i>Grade</i>	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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2.11. Required literature (available in the library and via other media)	<table border="1"> <thead> <tr> <th data-bbox="435 663 1082 790">Title</th> <th data-bbox="1082 663 1230 790">Number of copies in the library</th> <th data-bbox="1230 663 1394 790">Availability via other media</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 790 1082 913">1 Valpotic, I., Božić, F., Vlahović, K., Popović, M., Brkljačić, M., Valpotic, H., Pavlak, M. (2014): Immunomodulation in domestic animals. Faculty of Veterinary Medicine, University of Zagreb.</td> <td data-bbox="1082 790 1230 913"></td> <td data-bbox="1230 790 1394 913"></td> </tr> </tbody> </table>	Title	Number of copies in the library	Availability via other media	1 Valpotic, I., Božić, F., Vlahović, K., Popović, M., Brkljačić, M., Valpotic, H., Pavlak, M. (2014): Immunomodulation in domestic animals. Faculty of Veterinary Medicine, University of Zagreb.												
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2.12. Optional literature (at the time of submission of study programme proposal)																	
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous oral and written checking of acquired knowledge																
2.14. Other (as the proposer wishes to add)																	

COMPARATIVE NUTRITION

1. GENERAL INFORMATION			
1.1. Course teacher	Full professor Tomislav Mašek	1.6. Year of the study programme	4th
1.2. Name of the course	Comparative Nutrition	1.7. Credits (ECTS)	1
1.3. Associate teachers	Full professor Željko Mikulec, assistant professor Diana Brozić	1.8. Type of instruction (number of hours L + S + E + e-learning)	5+6+4
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2nd level, 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	The course objective is to show students the strategy of feeding and digestive physiology with emphasis on the comparative approach and ensure the students' acquired knowledge, skills and competencies are adequate to evaluate and make complex decisions in planning and implementing various types of animal feeding		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> • synthesize current knowledge about nutrition and physiology of all animals • assess the implications of the strategy of nutrition, the physiology of the digestive system and the diversification of animals to make decisions in veterinary practice 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> • to classify animals according to Hoffman and analyze the implications to nutrition of animals in zoos and intensive production • to identify animal species according to the strategy of digestion and digestive physiology • to assess the suitability of animals as models in biomedical research according to feeding strategy and physiology of the digestive system • knowledge of specific strategies of animal nutrition and to conclude how these can affect diet of domestic animals • to represent the opinion of the role of veterinarians in the diet of modern man and ancient nutrition linked to today's diseases 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures (4 hours):</p> <ul style="list-style-type: none"> • The evolution and ecology of feeding strategies, autoenzymatic digestion, aloenzymatic digestion, classification of animals according to the strategy of nutrition and physiology of the digestive system, Hoffman division (concentrate selectors, pasture, mixed) and criticism (the effect on physical properties of feed in the rumen, stratification and diversification of herbivores) • Fermentation: fore-stomach (ruminants and non-ruminants, birds), post-gastric (cecum, colon, cecum and colon), mutual comparison, the advantages and disadvantages, the distribution of species according to the site of fermentation and body mass, the theory of extinct species <p>Seminars (4 hours):</p> <ul style="list-style-type: none"> • Implications of Hoffman division and feeding of animals in ZOO, the implications of Hoffmann in farm animal rations 		

	<ul style="list-style-type: none"> Animals as models in nutrition science <p>Exercises (5 hours):</p> <ul style="list-style-type: none"> Specific strategies and unusual examples (birds with a high proportion of fiber in feed - Hoatzin, kolobos monkeys, for-gut fermentation, hippopotamus), hibernation <p>E-classes (2 hours):</p> <ul style="list-style-type: none"> Nutrition of wild animals and modern human (caveman diet, the ratio of intake of cholesterol and fatty acids n3/n6) 					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> online in entirety <input type="checkbox"/> mixed e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent study <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with the mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.05	Research		Practical training	
	Experimental work		Report	0.2	(other)	
	Essay		Seminar essay	0.5	(other)	
	Tests		Oral exam	0.25	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Cheeke, PR, Dierenfeld ES (2010) Comparative animal nutrition and metabolism, CABI					
2.12. Optional literature (at the time of submission of study programme proposal)						
2.13. Quality assurance methods that ensure the acquisition of exit competences						
2.14. Other (as the proposer wishes to add)						

CONSERVATION AND MANAGEMENT OF ENDANGERED SPECIES

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Josip Kusak	1.6. Year of the study programme	1
1.2. Name of the course	Conservation and Management of Endangered Species	1.7. Credits (ECTS)	1
1.3. Associate teachers	Assoc. prof. dr. sc. Tomislav Gomerčić, Assist. Prof. dr. sc. Magda Sindičić Mr. sc. Ana Štrbenac Dr. sc. Mirna Mazija	1.8. Type of instruction (number of hours L + S + E + e-learning)	0+0+15
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Facultative (elective)	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20% (three hours)
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim is to give students the ecological and sociological perspective of conservation of rare and endangered species. The course is a specific extension of the course «Zoology», and specifically of the section «basic ecology». Rare and endangered species do deserve special attention. Legal protection is typically basic but not sufficient mean to secure the species survival. Analyzed are the mechanisms of complex management that include all human-interest groups, with positive and negative attitude towards the species in concern. The examples of need for such complex management are species like bear, wolf, lynx, dolphins, monk seals, birds of prey including fish eating birds. International and Croatian models are discussed. Mutual understanding of all interest groups for the role of each species is to be stimulated. The role of veterinarians is exemplified.		
2.2. Course enrolment requirements and entry competences required for the course	none		
2.3. Learning outcomes at the level of the programme to which the course contributes	<ol style="list-style-type: none"> 1. evaluate key threats of animals by taxonomic groups 2. select optimal conservation measures for certain species 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ol style="list-style-type: none"> 1. distribute animal species according to IUCN threat categories 2. recognize interest groups in management of certain species 3. understand procedures of involving interest groups and methods of public surveys 4. set up elements of species management plan 		
2.5 Course content broken down in detail by weekly class schedule (syllabus)	IUCN – Caring for the Earth, World conservation strategy, Importance of selected environments, Influences of man through animal production. Croatian situation – causes of big diversity of species and landscapes. Terrestrial and aquatic ecosystems. State and perspectives for Croatian rare species – large carnivores as examples. Presentations and discussions of state and management of brown bear, wolf, and lynx in Croatia. Worldwide situation. International conventions, public interest, economic value, and the role of		

	course teachers in large carnivore research and management. Social aspects of endangered conservation. Methods of «human dimension surveys» and application of data to species management. International actions and role of Croatia on worldwide level. Examples of reintroductions of bears and lynx in Europe, and wolves in America. Bear management plan for Croatia. Wolf management plan for Croatia. Lynx management plan for Croatia. Features and implementation * Attached below in the form of Table.					
2.6. Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning (20%) <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities	Attending lectures, preparing from materials on LMS, preparing, presenting and defending the seminar					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,18	Research		Practical training	
	Experimental work		Report		Activity (other)	0,1
	Essay		Seminar essay		(other)	
	Tests	0,32	Oral exam		(other)	
	Written exam	0,40	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	During the course students do participate discussing the real situations with rare species conservation. They prepare a seminar paper which is orally presented and graded. Continuous knowledge checking and an exam in form.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Majić-Skrbinšek, A. (ed.) 2005. Lynx management plan for Croatia. Državni zavod za zaštitu prirode, Zagreb				10+WEB	
	Štrbenac, A. (ed.) 2005. Wolf management plan for Croatia. Državni zavod za zaštitu prirode, Zagreb				10+WEB	
	Iviček, B. (ed.) 20.05. Brown bear management plan for Croatia. Ministarstvo poljoprivrede, šumarstva i vodnog gospodarstva, Zagreb				10+WEB	
2.12. Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> - John H. Postlethwait, Janet L. Hopson (1989): The nature of life. USA - Odum, E. (1988): Fundamentals of ecology, USA Sinauer Associates Inc, Massachusetts, USA - Pimac, R. B. (1995): A primer of conservation biology. Sinauer Associates Inc, Massachusetts, USA 					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Attendance of seminars and exam.					
2.14. Other (as the proposer wishes to add)	-					

CYNOLGY AND FELINOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Niksa Lemo	1.6. Year of the study programme	4
1.2. Name of the course	Cynology and Felinology	1.7. Credits (ECTS)	2,0
1.3. Associate teachers	/	1.8. Type of instruction (number of hours L + S + E + e-learning)	20 L, 10 E
1.4. Study programme (undergraduate, graduate, integrated)	Undergraduate	1.9. Expected enrolment in the course	
1.5. Status of the course	active	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	The goal of the course in Cynology and Felinology is educated students with the particular characteristics of pure bred dog and cats in terms of breed variation and the specifics of inheritance, breeding, and training.		
2.2. Course enrolment requirements and entry competences required for the course	/		
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	During the course of the semester, students become acquainted with the biological origins of dogs and cats; this knowledge will help them in the understanding future patients, observing specific symptoms, harmonization of treatment and easiest talking with owner. Felinology, as part of lecture, is very important in introducing cat as companion animal, which has had been natural character of beast trough the thousand years living in human surrounding area, and cats did not change natural instincts in that period. Knowledge and skills from Felinology will help to all students in work with cats as patients, examination and treatment of cats, and easiest talking with owner. In this collegium student learn about specific vocabulary as part of veterinary medicine, these skills will help them in understanding of literature. Developing of vocabulary abilities are divided in oral and written level.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1.The origin of the dog (biological origin of the dog, ties with other canides today, the coming together of humans and dogs, the role of the dog in primitive society, the development of breeds through the history of society, the role of the dog in today's society);</p> <p>2. The physical build of dogs in the eyes of a cynologist (cynological anatomical terminology, special cynological terms for characteristic shapes of the teeth, nose, ears, tail, legs, paws, breast, fur, color, etc. Changes during the development of a young dog, aging, age determination);</p> <p>3. dog breeding (Fundamentals of inheritance, the sexual cycle, mating , pregnancy, birth, congenital defects among puppies, inherited defects in physical build, inherited nervous conditions, inherited eye diseases, inherited behavioral defects, various other inherited conditions, the inheritance of color. Breeding methods for related and unrelated dogs);</p>		

	<p>4. Dog hygiene (natural method of hygiene maintenance, hygiene maintenance for dogs who live in the household, brushing, combing, washing, clipping, trimming, common mistakes in dog hygiene, the performance of waste functions, environmental hygiene) and accommodation of dogs (accommodating a dog in a house or apartment, in a garden or courtyard, in a kennel; types and dimensions of living quarters, veterinary-hygienic attitudes about kennels, transportation of dogs);</p> <p>5. Feeding dogs (natural foods, the influence of humans on the diet of dogs, the influence of diet on health, harmful substances commonly found in dog food, dog food ingredients, number of meals, and preparation of food. The influence of food preparation on its hygienic and nutritional value);</p> <p>6. Pure-bred dogs (the concept of pure-bred varieties, pedigrees, cynology, dog-lovers, kennel clubs, cynological work, the division of breeds into morphological characteristics, the division of breeds according to work capabilities, the division of breeds according to FCI classifications, Croatian dog breeds, most common foreign breeds in Croatia);</p> <p>7. Training and Education (nervous system, senses, reflexes, learned or associative actions, methods of creating associative actions, application in training and education, estimating the nature of individual dogs);</p> <p>8. Dog judging at open shows (introduction of way of judge's work during valorization of dog's standard);</p> <p>9. Judging working abilities of dogs (introduction of characteristic of working breeds);</p> <p>10. Visit to international dog show (observing the most successful dogs in many different breeds);</p> <p>11. The Origin of the domestic cat (biological origin of the cat, ties with other felines today, the coming together of humans and cats);</p> <p>12. The Physical build of cat (anatomical terminology for characteristic shapes of the teeth, nose, ears, tail, legs, paws, breast, fur, color, etc. Specific cat senses and reflex);</p> <p>13. Felinology organizations and expositions, cat breeds (purebred, pedigrees, dividing breeds depends of morphological characteristic, European domestic breeds, exotic breeds);</p> <p>14. Cat hygiene and feeding (hygiene of cat, environment hygiene, feeding);</p> <p>15. International cat show (observing the most successful cats in many different breeds).</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance		Research		Practical training	
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests		Oral exam		(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	1. Bauer, M. (2000): Kinologija I – uzgoj, njega i hranidba pasa; udžbenik, vlastito izdanje, Zagreb		
	2. Bauer, M. (1985): Pas moj prijatelj, priručnik, Sveučilišna naklada Liber, Zagreb		
	3. Bauer, M., T.Babić (1994): Knjiga o mački, priručnik, vlastita naklada, Zagreb		
2.12. Optional literature (at the time of submission of study programme proposal)	1. J. Anne Helgren (2013) Encyclopedia of Cat Breeds 2. D. Caroline Coile (2015) Encyclopedia of Dog Breeds		
2.13. Quality assurance methods that ensure the acquisition of exit competences			
2.14. Other (as the proposer wishes to add)			

CYTOMETRY IN CLINICAL VETERINARY MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Assistant prof. Daniel Špoljarić, PhD	1.6. Year of the study programme	2
1.2. Name of the course	Cytometry in Clinical Veterinary Medicine	1.7. Credits (ECTS)	2
1.3. Associate teachers	Full prof. Maja Popović, PhD Full prof. Ksenija Vlahović, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	0+15S (9+6 e-learning)+15E
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be able to recognize and understand the basic principles of flow cytometry as a modern analytical methods for quantitative and qualitative analysis of animal cells within the cell population of interest.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>1 Students will be able to recognize and understand the contemporary aspects of flow cytometry within veterinary medicine and public health.</p> <p>2. Understand and apply different methods of sampling, preparation and processing of samples for structural analysis by flow cytometry, depending on the type of samples of animal origin.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>1. Understand and apply different methods of sampling, preparation and processing of samples for flow cytometry analysis function depending on the type of samples of animal origin.</p> <p>2. Know prepare protocols work in laboratories for processing, preparation and analysis of samples of animal origin flow cytometer.</p> <p>3. Know and apply the routine / daily check of linearity, optical flow and system flow cytometer.</p> <p>4. Check the accuracy of the apparatus for flow cytometry using the fluorescent microsphere suspension.</p>		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Basic principles of flow cytometry as a modern analytical methods for quantitative and qualitative analysis of animal cells within the cell population of interest. Historical development of flow cytometry of multidisciplinary scientific method to the independent laboratory discipline and its application in the world and in Croatia as part of clinical cytology and cytogenetics of interest in veterinary medicine and public health. Physico-chemical and molecular immune principles of flow cytometry. Differentiation of membrane molecules (CD markers). Immunophenotyping of cells of animal origin (application -specific antibodies for differentiation of membrane and/or intracellular antigens). Cytometric analysis of structural cells of animal origin (intracellular cell properties, size, shape, granularity, content of nucleic acids, chromosome analysis). Flow cytometric analysis of the function of cells of animal origin (measurement of the mouth of Ca⁺² into the cell, the measurement of the polarization of the cell membrane, the pH inside the cell, determining the phagocytic capacity of cells, measuring the</p>		

	intensity of oxidative stress, intracellular cytokine determination, determination of cell cycle, determining the proliferative capacity of the tumor). Cytometric analysis of different types of cell samples of animal origin (peripheral blood, bone marrow, lymph nodes aspirated fragments, swabs, washings, solid tissue prepared in the form of suspension cells, semen, excrement, meat, milk). Methods of sampling, preparation and processing of samples for analysis by flow cytometry, depending on the type of samples of animal origin.				
2.6. Format of instruction:	<input type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:
2.8. Student responsibilities	Attending seminar and lab exercises. Preparing for lab from materials on LMS. Preparing, presenting and defending one seminar.				
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training
	Experimental work		Report		Activity
	Essay		Seminar essay		(other)
	Tests	0,64	Oral exam		(other)
	Written exam	0,8	Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	<p>During the session of the “Cytometry in clinical veterinary medicine” course a student must attend 10 hours of seminars in order to gain 4 minimal points during the semester. The maximal number of points gained from this evaluation element is 6 points. During the session of the “Cytometry in clinical veterinary medicine” course a student must attend 9 hours of practices in order to gain 7 minimal points during the semester. The maximal number of points gained from this evaluation element is 12 points. During the session at the time of seminars and practices the student must solve specified problems from 15 seminar lessons and 15 exercise lessons, and he/she gains the lecturer’s signature for that. Each correctly done and signed seminar or exercise lesson is worth 1 point. At seminars and exercises a student can gain the total of 30 points For preparation of a seminar work during seminar lessons the student earns 5 additional points. During the session a student must gain the total of 18 points in order to earn minimal 5 points. The maximal number of points gained from this evaluation element is 10. During rounds will be organized one colloquium at the time of exercise of the 35 tasks or questions. Each correctly answered question or task is worth 1 point. Within this element it is possible to achieve a maximum of 35 points. From student must achieve 22 points in order to achieve a minimum of 20 points. A student who does not gain minimal 22 points from preliminary exams during the session, has a right to a makeup preliminary exam containing teaching material from all programme exercises, which will be organized upon completion of the lessons in that session. The total number of points at the preliminary exam is 35. A student who passes the makeup preliminary exam with more than 50 % correct answers has right to take the final exam. The minimal conditions for passing at the first, second, third and fourth evaluation elements will be summed up and they will be worth a total of 36 points. In order to take the final exam a student should gain the stated 36 points. The final exam starts with a student’s short analysis of results gained from the four types of activities of continuous knowledge checking. Questions in the final exam will be put in a way that a student can answer in writing. The maximum number of points that can be gained from the final exam is 60 points. A student must show at least a sufficient knowledge at the final exam regardless of gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 36 in order to gain minimal number of 24 points. In case a student does not satisfy</p>				

	<p>at the final part of the exam, the lecturer determines time for re-examination. Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all six evaluation elements, according the following table. The final mark is expressed in terms of quantity by a numeric value and by a grade in accordance with points value, from 1 to 5. Student who didn't successfully master the course programme is marked by 1. Mark 1 stands for insufficient achievement.</p> <table border="1" data-bbox="448 472 1297 757"> <thead> <tr> <th><i>Points</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>			<i>Points</i>	<i>Grade</i>	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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2.11. Required literature (available in the library and via other media)	<table border="1"> <thead> <tr> <th data-bbox="435 757 1082 853">Title</th> <th data-bbox="1082 757 1235 853">Number of copies in the library</th> <th data-bbox="1235 757 1402 853">Availability via other media</th> </tr> </thead> <tbody> <tr> <td data-bbox="435 853 1082 972">Popovic, M., K. Vlahović (2014): Handbook of Clinical Cytometry course in veterinary medicine: Application of flow cytometry in veterinary medicine. Faculty of Veterinary Medicine, University of Zagreb.</td> <td data-bbox="1082 853 1235 972"></td> <td data-bbox="1235 853 1402 972"></td> </tr> </tbody> </table>	Title	Number of copies in the library	Availability via other media	Popovic, M., K. Vlahović (2014): Handbook of Clinical Cytometry course in veterinary medicine: Application of flow cytometry in veterinary medicine. Faculty of Veterinary Medicine, University of Zagreb.												
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2.12. Optional literature (at the time of submission of study programme proposal)																	
2.13. Quality assurance methods that ensure the acquisition of exit competences	Continuous oral and written checking of acquired knowledge																
2.14. Other (as the proposer wishes to add)																	

DISEASES OF HONEYBEES IN CONTEMPORARY PRODUCTION

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Ivana Tlak Gajger	1.6. Year of the study programme	5 th
1.2. Name of the course	Diseases of Honeybees in Contemporary Production	1.7. Credits (ECTS)	1
1.3. Associate teachers	Assoc. Prof. Emil Gjurčević, Assis. Prof. Krešimir Matanović	1.8. Type of instruction (number of hours L + S + E + e-learning)	6+2+7
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	razina 1 on line 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	Course is predicted for students who wants expand general knowledge about beekeeping and for better understanding role of veterinarians in recognition and eradication of honey bee diseases. From abilities is provided acquisition modern ways of beekeeping, honey bee products obtaining, including artifical production of qeens, artificial insemination and production of swarms.		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	Course is following an obligatory course Biology and pathology of beneficial insects. Attending this course enable for diagnostic labarotory and field work at array of rearing honeybee colonies, production of swarms, queens and honeybee products.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Define place and role of veterinarian in recognition and eradication of honeybee diseases - Apply achieved knowledge in biology and pathology for obtain quality and hygenic approved honeybee products - Participate in work with artificial queens and swarms production 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures (6):</p> <ul style="list-style-type: none"> - Role of veterinarians in intensive beekeeping production - Effects of selection on productivity and health of honeybee colonies - Honeybee products and apitherapy - Artificial production of swarms <p>Seminars (2):</p> <ul style="list-style-type: none"> - Honeybee diseases which are eradicated according legislation directives, "new diseases" - Asian yellow leg hornet (<i>Vespa velutina</i>) <p>Exercises (7):</p> <ul style="list-style-type: none"> - Examination of honeybee colony 		

	<ul style="list-style-type: none"> - Artificial rearing of queens - Artificial insemination of queens - Biological and molecular methods of honeybee diseases diagnostic 					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:			
2.8.Student responsibilities	Active attending and participation at lectures (50%), seminars (60%), exercises and field work (75%). Accessing to continuous knowledge checking and final exam.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.18	Research		Practical training	
	Experimental work		Report		Activity on exercises and seminars	0.1
	Essay		Seminar essay		(other)	
	Tests		Oral	0.40	(other)	
	Written exam	0.32	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Attending lectures (3 – 6 points; 1 lecture hour equals 1 point) Attending exercises (4 – 6 points; 1 exercise hour equals 0.86 points) Attending seminars (4 – 6 points; 1 seminar hour equals 3) Participation at exercises and seminars (5 – 10 points; evaluated with short oral tests) Preliminary exam (4 questions, 20 – 32 points) Final exam - oral (24 – 40 points; 4 questions, 1 question equals 10 points)					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Vidal-Naquet, N. (2015): Honeybee Veterinary Medicine: <i>Apis mellifera</i> L. 5m Publishing Benchmark House, Sheffield, UK.			1		
	Laidlaw, H. H. (2005): Production of queens and package bees. The hive and the honey bee (ed. J. M. Graham). Dadant and Sons, Illinois, USA.					
	PP presentations of lectures, seminars and exercises				LMS	
2.12.Optional literature (at the time of submission of study programme proposal)	Connor, L. J., R. Muir (2012): Bee – sential: a field guide. Wicwas Press, Michigan, USA. Iatridou, D., L. Pohl, I. Tlak Gajger, N. De Briyne, A. Bravo, J. Saunders (2019): Mapping the teaching of honeybee veterinary medicine in the					

	European Union and European Free Trade Area. Vet. Rec. Open 6:e000343. doi:10.1136/vetreco-2019-000343
2.13. Quality assurance methods that ensure the acquisition of exit competences	Final exam - oral. At the Department there will be a Form for each student for keeping records of his/her lecture and exercises attendance and with a column's for evaluating his /her participation at exercises and for continuous knowledge checking.
2.14. Other (as the proposer wishes to add)	Anonymous student questionnaire.

ENGLISH FOR ACADEMIC PURPOSES I

1. GENERAL INFORMATION			
1.1. Course teacher	Dubravka Vilke-Pinter, Ph.D.	1.6. Year of the study programme	1
1.2. Name of the course	English for academic purposes I	1.7. Credits (ECTS)	4
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	5 hours of L+ 40 hours of S+ 15 hours of E
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The course English for Academic Purposes I is specially designed for the target group of learners, that is students of veterinary medicine. The general objective of the course is to develop students' overall written and oral competence in English to enable them to communicate efficiently in a professional setting. Special emphasis is given to professional literature analysis. Texts from various information sources (manuals, professional and scientific journals, popular magazines, web pages) are analysed to acquaint students with various types of discourse. Students are acquainted with texts belonging to different genres and having different content, function, and style (summary, report, discussion, essay, etc.), as well as with the language structures typically used in technical texts. Students develop text organisation skills through paragraph and essay writing, as well as the abilities to design and deliver well structured and clear oral presentations</p>		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>The course focuses on assisting students in developing the skills to speak and write effectively and fluently, using standard English. By getting acquainted with the veterinary medical terminology as well as with the different types of discourse, in particular with the academic texts, students improve their technical knowledge, that is language used specifically in the field of veterinary medicine, but also their overall academic performance, developing skills that are necessary to become independent and efficient readers and users of relevant professional literature, as well as fluent speakers in an English speaking professional setting.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>student will/ be able</p> <ul style="list-style-type: none"> to recognise different types of academic writing develop skills necessary to analyse structure different of forms of writing (essay, summary, presentation) be able to use various sources of information (web databases, scientific and professional journals) to efficiently use various language means to achieve text cohesion to participate in discussions, follow continuous argument in an academically acceptable manner 		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1st methodological unit: basic characteristics of academic style. Types of professional and academic texts: scientific papers, professional papers, reports, summaries, presentations, essays, projects. 2nd methodological unit: Structure and organisation of academic text. Main parts of an academic paper. 3rd methodological unit: Reading comprehension skills: skimming, scanning, intensive reading. 4th methodological unit: Achieving cohesion at the discourse level (sentence, paragraph, text). 5th methodological unit (4hours): Basic types of cohesive devices and their function. 6th methodological unit: Expressing time relations. Examples from various texts in the field of veterinary medicine. Reformulation. Examples from various texts in the field of veterinary medicine 7th methodological unit: Expressing causality. Examples from various texts in the field of veterinary medicine. Expressing contrast. Examples from various texts in the field of veterinary medicine. 8th methodological unit: Describing processes and procedures. Examples from various texts in the field of veterinary medicine 9th methodological unit: Definitions, simple definitions, academic definitions, extended definitions. 10th methodological unit: Professional and scientific journals – online data bases. 11th methodological unit: Writing essays and reports. Structure of an essay. 12th methodological unit: Literature reviews; Quoting; Paraphrasing. 13th methodological unit: Oral presentations. Data interpretation. 14th methodological unit: Oral presentations. Producing generalisation. Careful reasoning. Stating facts/expressing opinions. 15th methodological unit: Data interpretation. Interpreting graphical presentations. Classifications and exemplification. 16th methodological unit: Oral presentations. Planning a presentation. Identifying goals and aims of presentations. Providing feedback on presentations.</p>					
2.6. Format of instruction:	<input type="checkbox"/> lectures X <input type="checkbox"/> seminars and workshops X <input type="checkbox"/> exercises X <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,18	Research		Practical training	
	Experimental work		Report		Class participation	0,10
	Essay		Seminar essay	0,32	(other)	
	Tests		Oral exam		(other)	
	Written exam	0,40	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Assessment elements					
	Overall grade elements	1. exercises attendance 2. class participation 3. continual assessment 4. final exam				
	Type of activity		Minimal points		Maximal points	
	Lectures attendance	5 hourly classes	2 coefficient = 0,6 Students must attend at least 3 hourly classes to achieve minimum number of points	3		

	Exercises attendance	15 hourly classes	3 coefficient = 0,33 (5/15) Students must attend at least 9 hourly classes to achieve minimum number of points.	5
	Seminar attendance	40 hourly classes	6 coefficient = 0,25 (10/40) Students must attend at least 24 out of 40 hourly classes to achieve minimum number of points	10
	Class participation		6 coefficient = 0,17 (10/60 = 0,17) Students must earn at least 5 points out of maximum 10 by actively participating at classes. students complete various assignments for which they can earn points.	10
	Continual assessment		20 Students deliver their oral presentations.	32
	Final exam		24 Having read an original academic paper of their own choice students write a reading report which they present in class	40
	Final grade	Final grade is based on performance in 4 grading elements. Students are entitled to take the final exam if they have earned the minimum number of points for each of the evaluated elements (total of 36 points).		
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media	
	Vilke-Pinter, D. (2017). English for Academic Purposes (Part 1) . reading materials. Each student receives his/her copy of the materials.	3		
2.12. Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> - Benesch, S. (2001). Critical English for Academic Purposes. Lawrence Erlbaum Coffin. - Byrd, P., Murphy, J. (2006). Essentials of Teaching Academic Oral Communication (English for Academic Success). - Glendinning, E. H. Holmstrom, B. (2004). English for Academic Purposes: Study Reading. Cambridge University Press. - Jordan, R. R. (1999). Academic Writing Course, Study Skills in English. Longman. - McCarthy, M & O'Dell, F (2008). Academic Vocabulary in Use. Vocabulary Reference and Practice. Self-study and Classroom Use. Cambridge: CUP. - McCormack, J. (2005). English for Academic Study. Garnet Publishing Ltd. Garnet Education. - Porter. D & C Black (2007). Check your Vocabulary for Academic English. A & C Black Publishers Ltd. - Wallace M. J. (2004). Study Skills in English: Cambridge University Press. 			

2.13. Quality assurance methods that ensure the acquisition of exit competences	
2.14. Other (as the proposer wishes to add)	

ENGLISH FOR ACADEMIC PURPOSES II

1. GENERAL INFORMATION			
1.1 Course teacher	Dubravka Vilke-Pinter, Ph.D.	1.6. Year of the study programme	2
1.2. Name of the course	English for academic purposes II	1.7. Credits (ECTS)	4
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	5 hours of L + 40 hours of S + 15 hours of E
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>The object of the course is to develop further in the student a competence in using English both actively and receptively in order to be able to extract information from written and oral texts and from visual forms of presentation. In other words, the aim of the course is to improve in students both oral and written communication skills which will enable them to effectively communicate in a professional setting, and competently use veterinary medical professional literature.</p> <p>Through analysis of the texts from various information sources (manuals, professional and academic journals, online databases) and of different functional styles, students get acquainted with various types of discourse and the pertaining language structures. Special emphasis is given to developing written competence in English, i.e. skills and strategies for generating different forms of writing (summary, essay, etc.), as well oral communication skills and techniques necessary for designing and delivering a well structured and clear oral presentations. Students are also encouraged to take part in discussions and follow continuous argument</p>		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>The course focuses on assisting students in developing the skills to speak and write effectively and fluently, using standard English. By getting acquainted with the veterinary medical terminology as well as with the different types of discourse, in particular with the academic texts, students improve their technical knowledge, that is language used specifically in the field of veterinary medicine, but also their overall academic performance, developing skills that are necessary to become independent and efficient readers and users of relevant professional literature, as well as fluent speakers in an English speaking professional setting.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>student will/ be able</p> <ul style="list-style-type: none"> - to analyse different types of forms of academic writing and their functional styles - to use various sources of information (online databases, scientific and professional journals) - compose various forms of professional writing English, by using knowledge about the organisation and structure of various types of discourse. - to compose well structured and coherent oral presentations 		

	- to participate in discussions and follow continuous argument in an academically acceptable manner					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. methodological unit: Analysis of the structure of academic and technical text. Correct usage of language devices used to achieve text cohesion. Topic: Health and causative agents of diseases. Control and eradication of diseases. Topic: Zoonoses - Rabies; Foot and mouth disease; Anthrax; BSE; Swine fever; Avian influenza; Malaria. 2nd methodological unit: Writing skills: Essay: Structure of the essay. Topic: Farm animals. Laboratory animals. 3rd Methodological unit: Interpretation of data: Interpreting graphical forms of presentations. 4th methodological unit: Summary: Structure of a summary. Writing an effective summary. 5th methodological unit: Oral presentations: Developing oral skills. Planning oral presentations. Goals and aims of presentations. Analysis of various presentations. 6th Methodological unit: Delivering presentations. Types and methods of communication. Error analysis. Topic. Laboratory animals. 7. Methodological unit: Delivering presentations. Practising presentation skills. Discussion: argumentative speech. Topics: Cloning. Genetic engineering: benefits and perspectives. 8. Methodological unit: Students' presentations. Error analysis. Topic: Endangered species. Protection of endangered species. Presentation of topics of students' own choice. 9. Methodological unit: Students' presentations. Error analysis. Topic: Small animals. Pets. Keeping pets. Working animals. Presentation of topics of students' own choice. Surveys, questionnaires and projects. Reports. 7th. Methodological unit. Legal language. Topic: Legislative norms in veterinary medicine, coping with translation problems; negative transfer from Croatian.					
2.6. Format of instruction:	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops X <input type="checkbox"/> exercises X <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,18	Research		Practical training	
	Experimental work		Report		Class participation	0,10
	Essay		Seminar essay	0,40	(other)	
	Tests		Oral exam		(other)	
	Written exam	0,60	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Assessment elements					
	Overall grade elements	1. exercises attendance 2. class participation 3. continual assessment 4. final exam				
	Type of activity		Minimal points		Maximal points	
	Lectures attendance Exercises attendance	5 hourly classes	2 coefficient = 0,6 Students must attend at least 3 hourly classes to achieve minimum number of points		3	

		15 hourly classes	3 coefficient = 0,33 (5/15) Students must attend at least 9 hourly classes to achieve minimum number of points.	5
	Seminar attendance	40 hourly classes	6 coefficient = 0,25 (10/40) Students must attend at least 24 out of 40 hourly classes to achieve minimum number of points	10
	Class participation		5 Students must earn at least 5 points out of maximum 10 by actively participating at classes. At each class, students complete various assignments for which they can earn 1 point per class (coefficient = 0,17) (10/60 = 0,17)	10
	Continual assessment		20 Students deliver their oral presentations.	32
	Final exam		24 Having read an original academic paper of their own choice students write a reading report which they present in class	40
	Final grade	Final grade is based on performance in 4 grading elements. Students are entitled to take the final exam if they have earned the minimum number of points for each of the evaluated elements (total of 36 points)		
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Vilke-Pinter, D. (2017). English for Academic Purposes (Part 2) . reading materials. Each student receives his/her copy of the materials.		3	
2.12. Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> • Benesch, S. (2001). <i>Critical English for Academic Purposes</i>. Lawrence Erlbaum Coffin. • Byrd, P., Murphy, J. (2006). <i>Essentials of Teaching Academic Oral Communication (English for Academic Success)</i>. • Glendinning, E. H. Holmstrom, B. (2004). <i>English for Academic Purposes: Study Reading</i>. Cambridge University Press. • Jordan, R. R. (1999). <i>Academic Writing Course, Study Skills in English</i>. Longman. • McCarthy, M & O'Dell, F (2008). <i>Academic Vocabulary in Use. Vocabulary Reference and Practice. Self-study and Classroom Use</i>. Cambridge: CUP. • McCormack, J. (2005). <i>English for Academic Study</i>. Garnet Publishing Ltd. Garnet Education. • Porter. D & C Black (2007). <i>Check your Vocabulary for Academic English</i>. A & C Black Publishers Ltd. • Wallace M. J. (2004). <i>Study Skills in English: Cambridge University Press</i>. 			

2.13. Quality assurance methods that ensure the acquisition of exit competences	
2.14. Other (as the proposer wishes to add)	

FEED ADDITIVES - HEALTH MODULATORS

1. GENERAL INFORMATION			
1.1. Course teacher	Full professor Željko Mikulec, DVM, PhD	1.6. Year of the study programme	3rd
1.2. Name of the course	Feed Additives - Health Modulators	1.7. Credits (ECTS)	1
1.3. Associate teachers	Associate Professor Hrvoje Valpotić, DVM, PhD Diana Brozić, DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	3L + 2S + 10E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	2nd level, 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	The course objective is to show students the newest informations about manufacturing and application of feed additives and ensure the student's acquired knowledge, skills and competences are adequate to evaluate and make complex decisions in field of application of different essential and nonessential feed additives and dietetic preparations		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> • synthesize current knowledge about different feed additives • assess the implications of feed additives application in modern animal production 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> • to classify feed additives according to its composition and way of using • to assess the suitability of certain feed additives in different animal production systems • knowledge of influence of certain feed additives on animal health 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures (3 hours):</p> <ul style="list-style-type: none"> • Introduction (Feed-food chain. World's trends in food and feed quality and safety.) • Feed additives – importance and classification (The role of additives. Essential and nonessential additives. Micro and macro additives.) <p>Seminars (2 hours):</p> <ul style="list-style-type: none"> • Antibiotics (Antibiotic use in animal feed – in the past and nowadays.) <p>Exercises (10 hours):</p> <p>Extramural work - visit to feed additive factory</p> <p>Essential microadditives (Vitamins. Microminerals. Synthetic aminoacids.)</p> <p>Probiotic preparations (Probiotics. Prebiotics. Simbiotics. Fitobiotics.)</p> <p>Enzymes (Enzymes in monogastric animal feeding. Enzymes in ruminant feeding. Production and types of multienzyme preparations.)</p> <p>Antioxidants (Antioxidant function and types. The role of antioxidants in animal and human nutrition.)</p>		

	<p>Emulsifiers (Function and types of emulsifiers.) Pigments (Production and types of pigments.) Flavours (Function and types of flavours.) Acidifiers (Organic acids as feed acidifiers. The purpose and applying of acidifiers.) Tannins (Tannins – antinutritive compounds or additional mean of therapy.) Effect of nutraceuticals on the health status of animals and humans. (Current additives in diets of animals and people. Effect of nutraceutics on the immune response of animals and humans.)</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,18	Research		Practical training	
	Experimental work		Report		Activity	0,20
	Essay		Seminar essay		(other)	
	Tests	0,32	Oral exam	0,40	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Written final exam					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Adams C. A. (1999.): Nutricines. Food components in health and nutrition. Nottingham University Press, Nottingham					
	Adams C. A. (2002.): Total Nutrition. Feeding animals for health and growth. Nottingham University Press, Nottingham					
2.12. Optional literature (at the time of submission of study programme proposal)	Caygill J. C., Mueller-Harvey I.(1999.):Secondary Plant Product, Antinutritional and beneficial actions in animal feeding. Nottingham University Press. Boothe D. M. (1997.): Nutraceuticals in Veterinary Medicine. Part I. Definitions and Regulations. The Compendium 19 (11), 1248-1255. Boothe D. M.(1998): Nutraceuticals in Veterinary Medicine. Part II. Safety and Efficacy. The Compendium 20 (1), 15-21.					
2.13. Quality assurance methods that ensure the acquisition of exit competences						
2.14. Other (as the proposer wishes to add)						

FISH MORPHOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Snježana Kužir, Assoc. Professor	1.6. Year of the study programme	V
1.2. Name of the course	Fish morphology	1.7. Credits (ECTS)	2
1.3. Associate teachers	Emil Gjurčević,, Assoc. Professor Krešimir Matanović, Assist. Professor Lucija Bastiančić, assistant, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	S 10 + E 20
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate university study program of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e- learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of this course is to introduce students with the morphological variability of fish as well as histological structure of fish organ systems.		
2.2. Course enrolment requirements and entry competences required for the course	Completed compulsory course "Biology and Pathology of Aquatic Organisms". Prerequisite for exam: passed exam in the compulsory course "Biology and Pathology of Aquatic Organisms". Limited enrollment of 10 students.		
2.3. Learning outcomes at the level of the programme to which the course contributes	The subject is an upgrade of morphological subjects (anatomy, histology and embryology of domestic animals) in terms of macro and micro morphology of fish. At the same time, the subject is the introduction of an obligatory course Biology and pathology of aquatic organisms.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	By successfully mastered the material of the subjects, the student will be able to: -designate and define the basic elements of the macroscopic structure of fish tissues and organs; -designate and define the basic elements of the microscopic structure of fish tissues and organs; -compare the structure of certain organs in different fish species; -identify and analyze the histological slides of various organs and tissues; -explain the structure and development of fish.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 An introductory lecture (teaching rules, systematic of fish); 2 Peculiarities of the body shape due to swimming manners; 3 Characteristics of teleost skeletal system and support system of cartilaginous fish. Histological characteristics of fish muscle (a division of muscle, contractile characteristics); 4 Histological characteristics of the digestive system of fish due to the diet (mouth and pharynx, esophagus; stomach, intestine, spiral intestine in cartilaginous fish; pyloric endings; liver, pancreas); 5 Circulatory system (heart of		

cartilaginous fish; heart of teleost; gills circulation, blood elements); 6 Histological characteristics of the gill of teleost and cartilaginous fish, breathing in cartilaginous fish; breathing in teleost, lungfish; 7 Histological structure of fish bladder; gas gland; oval; 8 Urinary system (opisthonefros, histology of the kidney, the difference in the structure of the kidney of marine and freshwater fish); 9 Histology of reproductive system (ovaries, type of fish ovarian, oogenesis, testes, type of testes; spermatogenesis; genital canal); 10 Nervous System (anterior, middle and posterior brain, spinal cord, brain nerves, peripheral nerves, autonomic nervous system); 11 Sensory and electric organs (eye, eye shape and types; structure of the eyeball, eye adjustment to the amount of light, the inner ear, the labyrinth; otoliths; Weber's body; olfactory organ, lateral line; sensory buds; electroreceptors, electric organs); 12 Histology of the endocrine system (pituitary, pineal gland; urophysis; thyroid; ultimobranchial gland; interrenal gland; chromafin cells, the endocrine part of the pancreas); 13 Skin and scales (epidermis and epidermal glands, dermis, scales and forms of scales, poisonous gland; the color of the body; chromatophores and their types; pigments of chromatophores; mechanism of changes the color of the body); 14 Bioluminescence (luminous bodies; structures of luminous organs; alveolar and sac-like luminous bodies; visceral light organs, bacterial and chemical bioluminescence).

Seminars:

- Basics of fish systematic, body shape, skin and scales (1)
- Musculoskeletal System (2)
- Digestive System (2)
- The Circulatory System (1)
- Respiratory System (2)
- Urinary System (1)
- Reproductive System (2)
- The nervous system, sensory and electric organs (2)
- Endocrine System (1)
- Swim bladder (1)

Exercises:

- Histology of skin, pigment cells and the scales (2)
- Anatomy and histology of bone and muscle histological characteristics (2)

	<p>-Parts of the digestive tube and histological characteristics of the gastrointestinal tract (2)</p> <p>-The heart and blood vessels (histological characteristics), cellular components of blood and preparation of a blood smear (3)</p> <p>-Histological characteristics of gills (1)</p> <p>-Structure and histological characteristics of a kidney (1)</p> <p>-Histology of genital system (1)</p> <p>-The brain, spinal cord, eye, otoliths (1)</p> <p>-The pituitary gland, endocrine part of the pancreas (1)</p> <p>-Histological structure of the swim-bladder, a gas glands, oval (1)</p>					
2.6.Format of instruction:	<input type="checkbox"/> lectures X seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments: The introduction of LMS for the course. During the exercises, students use microscopes, which determines the size of the group at 10 students.		
2.8.Student responsibilities						
2.9.Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	0.36	Research		Practical training	
	Experimental work		Report		Activity	0,2
	Essay		Seminar essay	0.64	(other)	
	Tests		Oral	0.80	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	FERGUSON, H. W. (2006.): Systemic pathology of fish: A text and atlas of normal tissues in teleosts and their responses in disease. Scotian Press, London. UK				1	
	GENTEN, F., E. TERWINGHE, A. DANGUY (2009.): Atlas of Fish Histology. Science Publisher, Enfield, Jersey, Plymouth. USA				1	
	PP of lectures and excercises					LMS
2.12.Optional literature (at the time of submission of study programme proposal)	TAKASHIMA, F., T. HIBIYA (1995.): An atlas of fish histology: normal and pathological features. Gustav Fischer Verlag. New York.					

2.13. Quality assurance methods that ensure the acquisition of exit competences	Monitoring of attending to seminars and exercises, activities during the exercises, the success on the final oral exam.
2.14. Other (as the proposer wishes to add)	It is necessary to introduce e-learning. It is necessary to supply required mandatory and additional literature.

FISHERY

1. GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Emil Gjurčević	1.6. Year of the study programme	5 th and 6 th
1.2. Name of the course	Fishery	1.7. Credits (ECTS)	1
1.3. Associate teachers	Assistant Professor Krešimir Matanović, Full Professor Ivana Tlak Gajger,	1.8. Type of instruction (number of hours L + S + E + e-learning)	3+4+8
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	10
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 1 online instruction 10%
2. COUSE DESCRIPTION			
2.1. Course objectives	The course is anticipated for students who wish to enlarge their general knowledge of fishery in Croatia as well as in the world. Therefore, the aim of the course is to introduce students to tools, techniques and regulations in fishery, and with management practice in the open waters.		
2.2. Course enrolment requirements and entry competences required for the course	Completed exam in Biology and Pathology of Aquatic Organisms		
2.3. Learning outcomes at the level of the programme to which the course contributes	The course represents synthesis of previous veterinary disciplines and presents knowledge in the field of fishery. This course is linked to obligatory course Biology and Pathology of Aquatic Organisms and elective course Selected Chapters in Aquaculture. Upon the course completion, students will be qualified for work in fishery.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Recognize certain fish species and other aquatic organisms of great importance for fishery - Interpret Regulations relating to marine and freshwater fisheries - Distinguish the tools and techniques of fisheries - Analyze the basic parameters of water quality - Implement measures to prevent water pollution 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures (3)</p> <ul style="list-style-type: none"> ○ Fish essentials (fishery, aquaculture) ○ Water and health status of fish (sending of water samples for laboratory examinations; water quality monitoring) ○ Asphyxia ○ Systematic of marine fish important for fishery <p>Exercises (8)</p> <ul style="list-style-type: none"> ○ Work in the field of freshwater fishery ○ Sport fisheries ○ Tools and techniques of fisheries ○ Health status of fish 		

	Seminars (4)					
	<ul style="list-style-type: none"> ○ Legislative and other regulations related to fishery ○ Systematic of freshwater fish important for fishery ○ Artificial reefs 					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities	Attendance of lectures (50%), exercises and seminars (70%); active participation at exercises and seminars; continuous assessment.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.18	Research		Practical training	
	Experimental work		Report		Participation at exercises	0.1
	Essay		Seminar essay		(other)	
	Tests	0.32	Oral exam	0.40	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Evaluation elements: 1. Attending lectures: 3-6 points (1 lecture hour equals 2 point) 2. Attending exercises: 4-6 points (1 hour equals 0,75 points) 3. Attending seminars: 4-6 points (1 hour equals 1,5 points) 3. Participation at exercises: 5-10 points (evaluated with short oral tests) 4. Continuous knowledge checking 20-32 points (evaluated with short oral tests during seminars) 5. Final exam – oral: 24-40 points (4 questions): 1 question equals 10 points					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	ANDREWS, C., A. EXELL, N. CARRINGTON (1988): The manual of fish health. Salamander book, London, New York.				1	
	ROBERTS, R. J. (2001): Fish pathology. W. B. Saunders. London.				1	
	PP presentations of lectures and exercises					LMS
	KOTTELAT, M., J. FREYHOF (2007): Handbook of European freshwater fishes. Kottelat, Cornol, Switzerland and Freyhof, Berlin.					
	BRUNO, D. W., P. A. NOGUERA, T. T. POPPE (2013): A colour atlas of salmonid diseases, Second Edition. Springer.					
2.12.Optional literature (at the time of submission of study programme proposal)	ALABASTER, J. S. (1977): Biological monitoring of inland fisheries. Applied Science Publishers. ALABASTER, J. S., R. LLOYD (1980): Water quality criteria for freshwater fish. Butterworths.					

2.13. Quality assurance methods that ensure the acquisition of exit competences	Final exam – oral. At the Department there will be a Form for each student for keeping records of his/her lecture and exercises attendance and with a columns for evaluating his/her participation at exercises and for continuous knowledge checking.
2.14. Other (as the proposer wishes to add)	

FUNDAMENTALS OF AGRONOMY

1. GENERAL INFORMATION			
1.1. Course teacher	Željko Pavičić, DVM, PhD, Full Professor	1.6. Year of the study programme	II
1.2. Name of the course	Fundamentals of agronomy	1.7. Credits (ECTS)	2,5
1.3. Associate teachers	Gordana Gregurić Gračner, PhD, Associate Professor; Mario Ostović, PhD, Assistant Professor	1.8. Type of instruction (number of hours L + S + E + e-learning)	L 12+ S 11+ E 7
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Livestock and crop production constitute a production unit which is expressed not only by their organic connection, but also with their spatial location. Therefore, the aim of course is that the students acquire knowledge on the impact of weather and climate on plant's life, biological crops and yield, the natural laws on the basis of which a yield could be produced, as well as on the compaction of soil by the antropogenic influence. In the center of discussion is agrotehnicque in all of its aspects and management systems in plant production. Special attention is paid to the ecologic (organic) and sustainable agriculture, so students will gain the knowledge on how to preserve the environment, clean air and soil, drinking water and associated quality of food.		
2.2. Course enrolment requirements and entry competences required for the course	Passed compulsory course Environment, Animal Behaviour and Welfare with minimum grade 4 (B). Mentor type of teaching, up to 3 students.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Understanding of agroecological fundamental facts in plant production		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course the student will be able to: -explain the impact of weather and climate effects on plant life -recognize differences in soils and describe soil treatment methods -describe nutrients proceedings in soil - evaluate the right time for planting and distinguish sowing methods - explain the natural laws on the basis of which a yield could be produce - illustrating the ways for saving and storing agricultural products - define the principles of organic and sustainable agricultural production		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1 Introduction to agronomy (Basic elements for organic life; Atmospheric impact on plants in general; Weather and climate, Natural ecosystems; Water as ecological factor); 2 Soil (Soil definition, character and function; Basic characteristics if main soil types; Soil and vegetation relation; Soils in Croatia); Land cultivation (Definition and tasks; Traditional and modern approach of land cultivation; Effects of		

	cultivation to physical characteristics and processing in soil; Basic and additional land cultivation; Land cultivation systems); 3 Plants feeding and plants nutrients (Nutrients proceedings in soil; Fertilization; Fertilizers); 4 Sowing (Seeds; Field crop seeds characteristics; Preparation of seed for sowing; Quantity determination of seeds for sowing; Sowing types; Sowing time); 5 Crops care (Abiotic and biotic negative factors; Systematic division of crop care grips: Sequence of crop care grips; Veiling of production areas); 6 Weeding (Weed concept and definition; Weeding measures); 7 Harvest, storing and conservation of agricultural products (Grain crops; Root and tuberous crops; Stern crops); 8 Plant production systems (Crop rotation; Free crop shift ; Monocrop); 9 Biological agronomy (Biological agronomy directions; Scientific principles of biological agronomy; Legislative regulation on biological agronomy); 10 Maintainable agronomy (General notion about land cultivation in terms of maintainable agronomy; Ecologically balanced measures of managing in maintainable agronomy; Water managing in different plant production systems).					
2.6. Format of instruction:	X lectures X seminars and workshops X exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments X multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments: Practical training will be done at Hunting and education polygon Črnovščak with technique and on 5,5 hectares arable land owned by Department of Game Biology, Pathology and Breeding			
2.8. Student responsibilities	1. attending lectures 2. attending exercises 3. attending seminars 4. participation at exercises and seminars 5. continuous knowledge checking 6. final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,45	Research		Practical training	
	Experimental work		Report		Participation at exercises and seminars	0,25
	Essay		Seminar essay		Final (oral) exam	1,00
	Tests	0,80	Oral exam		(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activities		Minimal number of points		Maximal number of points	
	Attending lectures		3		6	
	Attending exercises		4		6	
	Attending seminars		4		6	
	Participation at exercises and seminars		5		10	
	Continuous knowledge checking		20		32	
	Final exam		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Panda, S. C. (2012): Agronomy. Agrobios (India), Jodhpur.					

	Pearson, C. J., R. L. Ison (1997): Agronomy of grassland systems. 2nd edition. Cambridge University Press, New York, USA.		
	Sheaffer, C. C., K. M. Moncada (2012): Introduction to agronomy: food, crops, and environment. 2nd edition. Delmar, Cengage Learning, USA.		
2.12. Optional literature (at the time of submission of study programme proposal)			
2.13. Quality assurance methods that ensure the acquisition of exit competences	Type of activities	Minimal number of points	Maximal number of points
	Attending lectures (12 hours)	3 (coefficient 0,5) $3/0,5 = 6$ lecture hours (a student must attend minimal 6 lecture hours in order to gain minimal 3 points)	6 $6/12 = 0,5$ (coefficient 0,5)
	Attending exercises (7 hours)	4 (coefficient 0,86) $4/0,86 = 5$ exercise hours (a student must attend minimal 5 exercise hours in order to gain minimal 4 points)	6 $6/7 = 0,86$ (coefficient 0,86)
	Attending seminars (11 hours)	4 (coefficient 0,55) $4/0,55 = 7$ seminar hours (a student must attend minimal 7 seminar hours in order to gain minimal 4 points)	6 $6/11 = 0,55$ (coefficient 0,55)
	Participation at exercises and seminars (10 points ¹)	5 $5/1 = 5$ (coefficient 1) (a student must collect minimal 5 points in order to gain minimal 5 points)	10 $10/10 = 1$ (coefficient 1)
	Continuous knowledge checking (8 bodova ²)	20 $20/4 = 5$ (coefficient = 4) (a student must collect minimal 5 points in order to gain minimal 20 points)	32 $32/8 = 4$ (coefficient = 4)
	Final exam (40 bodova ³)	24 $24/1 = 24$ (coefficient 1) (a student must collect minimal 24 points in order to gain minimal 24 points)	40 $40/40 = 1$ (coefficient 1)
	Total	60	100
	¹ -10 points (writing of the report from field exercises (4 points)+preparation of seminar work during semester (3 points if in PP additional 3 points) ² -8 points (8 questions, every correct answer worth 1 point) ³ -40 points (written exam - 8 questions/ for every question 2 points for „sufficient“ answer, 3 points for „good“, 4 points for „very good“, 5 points for „excellent“)		

	Final grade:														
	The final grade is formed on the basis of total sum of achieved points according to:														
	<table border="1"> <thead> <tr> <th><i>Points</i></th> <th><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>	<i>Points</i>	<i>Grade</i>	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
	<i>Points</i>	<i>Grade</i>													
	up to 59	1 (F)													
	60-68	2 (E)													
	69-76	2 (D)													
	77-84	3 (C)													
85-92	4 (B)														
93-100	5 (A)														
2.14. Other (as the proposer wishes to add)															

FUNDAMENTALS OF ECOLOGIC LIVESTOCK BREEDING

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof Mario Ostović, PhD	1.6. Year of the study programme	II
1.2. Name of the course	Fundamentals of Ecologic Livestock Breeding	1.7. Credits (ECTS)	2
1.3. Associate teachers	Prof. Željko Pavičić, PhD, Prof. Kristina Matković, PhD, Assoc. Prof Gordana Gregurić Gračner, PhD,	1.8. Type of instruction (number of hours L + S + E + e-learning)	L 10+S 5+E 15
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	In this course students have possibility to meet basic characteristics of domestic animal breeding in ecologically accepted way, and the role of veterinary profession in this relatively new branch of agricultural production. Therefore, they gain knowledge on law regulations in ecologic livestock breeding, animal species and breeds acceptable for ecologic production, breeding methods, animal housing and feeding, effects of ecologic production on environment, animal health protection and treating as well as veterinary-sanitary control of foodstuffs of animal origin in ecologic production. Better competencies in ecologic livestock breeding can be gained by vertical integration of this area through specific course in postgraduate study.		
2.2 Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - knowledge on law regulations in ecologic livestock breeding - knowledge on animal species and breeds acceptable for ecologic production - basic knowledge on breeding methods, animal housing and feeding in ecologic production - basic knowledge on effects of ecologic production on environment - basic knowledge on animal health protection and treating as well as veterinary-sanitary control of foodstuffs of animal origin in ecologic production 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course the students: <ul style="list-style-type: none"> - will have basic knowledge on law regulations in ecologic livestock breeding - could enumerate animal species and breeds acceptable for ecologic production - will have basic knowledge on breeding methods, animal housing and feeding in ecologic production - will have basic knowledge on effects of ecologic production on environment - will have basic knowledge on animal health protection and treating as well as veterinary-sanitary control of foodstuffs of animal origin in ecologic production 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Introduction; 2. Animal species and breeds and size of ecologic livestock production in Croatia and world; 3. Animal breeding methods in ecologic production; 4. Environmental effects of ecologic livestock production; 5. Size of area required for animal breeding in ecologic production; Maximum number of animals <i>per</i> hectare related to tolerable production of nitrogen in manure; 6.		

	Permitted sanitary agents in ecologic production; 7. Animal transport in ecologic production; 8. Voluminous and concentrated forages					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities	1. attending lectures 2. attending exercises 3. attending seminars 4. participation at exercises and seminars 5. continuous knowledge checking 6. final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Attending lectures	0,12	Research		Practical training	
	Experimental work		Report		Attending seminars	0,12
	Essay		Seminar essay		Attending excersises	0,12
	Continuous knowledge checking	0,64	Oral exam (final exam)	0,80	Participation at exercises and seminars	0,20
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activities		Minimal number of points		Maximal number of points	
	attending lectures		3		6	
	attending seminars		4		6	
	attending exercises		4		6	
	participation at exercises and seminars		5		10	
	continuous knowledge checking		20		32	
	final exam		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Andersen, A. B. (2000): Science in agriculture: advanced methods for sustainable farming. 2nd edition. Acres, USA.				Internet	
	Dawkins, M. S., R. Bonney, Eds. (2008): The future of animal farming: renewing the ancient contract. Blackwell Publishing, USA.					
	Dupree, G. (2010): Homeopathy in organic livestock production. Acres, USA.					
	Ekarius, C. (1999): Small-scale livestock farming: a grass-based approach for health, sustainability, and profit. Storey Publishing, LLC, MA, USA.					
	Fossel, P. V. (2014): Organic farming: how to raise, certify, and market organic crops and livestock. Voyageur Press, USA.					
	Paajanen, T. (2011): The complete guide to organic livestock farming: everything you need to know about natural farming on a small scale (Back-to-basics farming). Atlantic Publishing Group, Ocala, Florida, USA.					

	Thistlethwaite, R., J. Dunlop (2015): The new livestock farmer: the business of raising and selling ethical meat. Chelsea Green Publishing, USA.																
2.12. Optional literature (at the time of submission of study programme proposal)																	
2.13. Quality assurance methods that ensure the acquisition of exit competences	Types of activities	Minimal number of points	Maximal number of points														
	Attending lectures (10 hours)	3 3/0.6 = 5 lectures hours (min.)	6 6/10 = 0.6 (coefficient for attending 1 lecture hour)														
	Attending seminars (5 hours)	4 4/1.2 = 3 seminar hours (min.)	6 6/5 = 1.2 (coefficient for attending 1 seminar hour)														
	Attending exercises (15 hours)	4 4/0.4 = 10 exercise hours (min.)	6 6/15 = 0.4 (coefficient for attending 1 exercise hour)														
	Participation at seminars and exercises (7 points ¹)	5 5/1.43 = 4 (coefficient 1.43) (a student must earn 4 points in order to gain minimal 5 points)	10 10/7 = 1.43 (coefficient 1.43)														
	Continuous knowledge checking (8 points ²)	20 20/4 = 5 (coefficient = 4) (a student must earn 5 points in order to gain minimal 20 points)	32 32/8 = 4 (coefficient = 4)														
	Final exam (40 points ³)	24 24/1 = 24 (coefficient 1) (a student must earn 24 points in order to have minimal 24 points)	40 40/40 = 1 (coefficient 1)														
	Total	60	100														
¹ -7 points (preparation of seminar work during semester 4 points, if the seminar work is prepared in PP additional 3 points) ² -8 points (8 questions, every correct answer worth 1 point) ³ -40 points (oral exam - 8 questions/ for every question 2 points for „sufficient“ answer, 3 points for „good“, 4 points for „very good“, 5 points for „excellent“) The final grade is made on the basis of total sum of gained points as follows:																	
<table border="1"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>				Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
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93-100	5 (A)																
2.14. Other (as the proposer wishes to add)																	

FUNDAMENTALS OF PHYSICS FOR DIAGNOSTICS METHODS

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Selim Pašić	1.6. Year of the study programme	3.
1.2. Name of the course	Fundamentals of Physics for Diagnostics Methods	1.7. Credits (ECTS)	2
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	20 + 10 + 0 + 0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elected	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of the course is to develop an understanding of the physical principles of ultrasound, X-ray, NMR diagnostic devices and thermography. Thus, students can understand, which kind of diagnostic technique can be used for imaging of certain (properties) tissue, where it gives the best results, and limits of diagnostic technique presented.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Students gain a clear picture of the work and the possibilities of diagnostic methods and devices, which enable them, in future clinical practice, to make the proper selection of diagnostic methods for their patients, and correctly interpret the results.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> -Develop an understanding of ultrasound and its possibilities. -Develop an understanding of the capabilities and use of X-ray diagnostics. -Understand the principles of nuclear magnetic resonance, and its possibilities and application as diagnostic methods. -Understand thermography and its application in the diagnostic and the use of contrast agents. 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Basic and physical quantities and their mathematical representation in diagnostic methods (measurement; SI; notation; examples of mathematical expressions in the description of physical quantities: the ratios, the reciprocal value, logarithms, exponential functions, graphing, calculus, trigonometry, statistics); Waves and oscillations (wave equation, harmonic oscillations, damped oscillations, resonance) (2 lectures)</p> <p>Ultrasound-waves diagnostic (basic physics of ultrasound, ultrasound transducers and probes; echoscope systems, functioning, resolution, resolution limits; Doppler effect; imaging based on the principle of the Doppler effect, the application of ultrasound in the diagnosis, issues of ultrasound diagnostic) (2 lectures)</p> <p>X-ray techniques (sources and properties of X-rays; indicators of X-ray radiation, X-ray machines; tomography, angiography) (2 lectures)</p> <p>Physical fundamentals of magnetic-resonance imaging (microscopic characteristics related to magnetic resonance imaging; interaction of nuclei with constant RF and magnetic fields, magnetic nuclei in our body; macroscopic</p>		

	magnetization, chemical shift, relaxation time, structure and dynamics of tissue observed by MRI; gradient magnetic field; pulse sequences, building images, resolution methods, choice of contrast in the picture - choice T1 or T2 relaxation time, functional MR imaging, basic considerations of in vivo spectroscopy, biological effects of strong magnetic fields) (2 lectures) Thermography (thermal imaging application in veterinary medicine, thermography). Contrast agents in diagnostic (types and properties of contrast agents, the choice of contrast agents to observe the structure and dynamics of tissue). (2 lectures) Seminar papers of students (10 seminars)					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.10. student responsibilities						
2.11. screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activity	0,2
	Essay		Seminar essay	0,0	(other)	
	Tests	0,64	Oral exam		(other)	
	Written exam	0,8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	D. J. Dowsett, P. A. Kenny, R. E. Johnston: The Physics of Diagnostic Imaging, Chapman & Hall Medical, London, 1998.			1		
	Westbrook, C. Kaut: MRI in practice, Blackwell Science, Oxford, 1993			1		
2.12. Optional literature (at the time of submission of study programme proposal)	Russell K. Hobbie, Bradley J. Roth: Intermediate Physics for Medicine and Biology, Springer, 2006.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading and evaluating student work in class and at the final exam					
2.14. Other (as the proposer wishes to add)						

FUNDAMENTALS OF SCIENTIFIC RESEARCH

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Željko Grabarević	1.6. Year of the study programme	1 st
1.2. Name of the course	Fundamentals of Scientific Research	1.7. Credits (ECTS)	2
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	8+4+18
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	- to teach students about the basic principles of scientific work - to motivate students to find and read research papers relevant to their field and write scientific articles		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	This course is essential for the scionetific student education and their enrollement in the Afculy scientific work.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	The students shud be able to: search medical information on the web formulate scietific hypothesis prepare a research propousal analyse and present results of research cite the source of information used in research write scientific article		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Science and scientific research (L 2) 2. Scientific areas (field and disciplines). Scientific research in regard to research methods as well as to the level and aim of investigation. Hypothesis. Experiments. Materials (samples) for experiments. Methods used in experiments. (L 4) 3. Structure of medical literature (L 2) 4. Original scientific paper. Scientific style used in scientific paper. Structure (chapters) and content of an original scientific paper. (S 2) 5. Scietific publication (S 2) 6. Publishing of results of experiments (E 2). 7. Searching scientific information on the web (E 4) 8. Presentation of results of experiments (E 2). 9. Citing references (E 2) 10. Searching for relevant journal articles referring to the problem of study (E 4) 11. Organization (structure) and analysis of content of original scientific paper and diploma work (E 4)		
2.6. Format of instruction:	X lectures X seminars and workshops X exercises <input type="checkbox"/> on line in entirety	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory	2.7. Comments:

	<input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		
2.8. Student responsibilities	It is not allowed to be absent at all format of instructions. In case of an excused absence, the student must take a preliminary exam			
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research	Practical training
	Experimental work		Report	Activity (other) 0,2
	Essay		Seminar essay	(other)
	Tests	0,64	Oral	(other)
	Written exam	0.8	Project	(other)
2.10. Grading and evaluating student work in class and at the final exam	1. attending lectures (6 %) max. 6 points; min. 3 points 2. exercises (36 %); max. 36 points; min. 20 points 3. seminars (18%) max. 18 points; min. 13 points 4. final exam (40%) max. 40 points – min. 24 points			
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library	Availability via other media
	Marušić, M. Principles of research in medicine. Medicinska naklada, Zagreb, 2008.			
2.12. Optional literature (at the time of submission of study programme proposal)				
2.13. Quality assurance methods that ensure the acquisition of exit competences	continuous knowledge checking written exam			
2.14. Other (as the proposer wishes to add)				

FUNDAMENTALS OF THE TUMOR MOLECULAR PATHOLOGY AND HISTOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Marko Hohšteter	1.6. Year of the study programme	5 th
1.2. Name of the course	Fundamentals of the Tumor Molecular Pathology and Histology	1.7. Credits (ECTS)	2,0
1.3. Associate teachers	Assoc. professor Andrea Gudan Kurilj, PhD, DECV, DVM; Assistant professor Ivan-Conrado Šoštarić-Zuckermann, PhD, DECV, DVM; Doroteja Huber, PhD, DVM; Lidija Medven, PhD DVM; Ivana Mihoković Buhin, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+0+20+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Active	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	Most recent knowledge in the field of tumor molecular pathology		
2.2. Course enrolment requirements and entry competences required for the course	Exam in general pathology		
2.3. Learning outcomes at the level of the programme to which the course contributes	Training students to be able at the end of the course to analyze histopathological, immunohistochemical and cytological preparations of the most important tumors in animals as well as to give knowledge important for understanding of pathogenesis and therapy of tumors.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	The aim of the course is to give students a basic knowledge of veterinary medicine on the molecular events during the histopathological changes through development of tumors and metastases. Also considered about mutations and carcinogenesis, mechanisms of tumor growth and metastasis and defense of it, the possibilities of preventing the occurrence of tumors, and reached via a diagnosis and treatment of tumors and metastases.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures:		
	Methodological units	Content	Number of lessons
	Characteristics of benign and	Definition and anaplasia, growth rate, local	2h

	malignant neoplasms	invasion and metastasis	
	Epidemiology of neoplasms	The incidence of tumors, geographical factors, environmental influences, age and heredity in the occurrence of tumors, acquired preneoplastic disease	1h
	Carcinogenesis (molecular basis of cancer)	Oncogenesis and cancer, tumor suppressor genes. Molecular basis of multilevel carcinogenesis, karyotypic changes in tumors	2h
	Biology of tumor growth	The kinetics of tumor growth, tumor angiogenesis, mechanisms of local and distant tumor spread	1h
	The etiology of tumor-carcinogenic agents	Chemical carcinogens, radiation carcinogenesis, viral oncogenesis	1h
	Host defense of tumor-tumor immunity	Tumor antigens, anti-tumor effector mechanisms, tumor immune monitoring	1h
	Clinical characteristics of tumors	The effects of the tumor on the host, grading and stages of cancer, laboratory diagnosis of tumors	2h
Exercises:			
Microscopy histopathological, immunohistochemical and cytological slides, also introduction to the basic cytological methods - 20 h			
Methodological units	Content	Number of lessons	

	Exercises 1.	Skin tumors	4h		
	Exercises 2.	Tumors of circumanal glands in dogs	4h		
	Exercises 3.	Canine mast cell tumors	4h		
	Exercises 4.	Tumors of the testes in dogs	4h		
	Exercises 5.	Tumors of domestic animals – case reports	4h		
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:
2.8.Student responsibilities					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training
	Experimental work		Report		Activity (other)
	Essay		Seminar essay		(other)
	Tests	0,64	Oral exam		(other)
	Written exam	0,8	Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	The final exam is in written form. Student with passed exam achieves 2 ECTS points. The written exam consists of 15 questions. For 8 and 9 correct answers students achieves the minimum passing grade 2; for 10 or 11 correct answers grade 3, for 12 or 13 correct answers grade 4, for 14 or 15 correct answers grade 5.				
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media
	1. James F. Zachary.: Pathologic Basis of Veterinary Disease Expert Consult, 6th Edition , Mosby, 2016.			3	
	2. Jubb, Kennedy, and Palmer's pathology of Domestic Animals. 6 th ed. Edited by Grant Maxie M. Philadelphia: Saunders; 20.			2	
	3. D. J. Meuten: Tumors in Domestic Animals, Fifth Edition, John Wiley & Sons, 2017.			1	

2.12.Optional literature (at the time of submission of study programme proposal)	4. Robbins and Cotran Pathologic Basis of Disease, Professional Edition 8th Edition; Authors: Kumar, V.; A. Abbas; N. Fausto; J. Aster, Saunders, 2009
2.13.Quality assurance methods that ensure the acquisition of exit competences	
2.14. Other (as the proposer wishes to add)	

GAME ZOOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Professor Zdravko Janicki, DVM, MSc, PhD	1.6. Year of the study programme	2 nd

1.2. Name of the course	Game Zoology	1.7. Credits (ECTS)	2
1.3. Associate teachers	Professor Alen Slavica DVM, PhD Assistant professor Magda Sindičić, DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	5L+25E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	level 1
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>By attending the elective course Game Zoology students will gain basic knowledge on peculiarities of morphology, biology, life characteristics and specific habits of majority of game species in Croatia. This knowledge is fundamental to attend tuition from Game Breeding and Management and Wildlife Diseases, located in the higher semesters. The acquired knowledge represents connection that enables further education according to the principles of vertical integration. In the practical part of this course students will gain necessary knowledge for further improvement of skills for successful species age and sex evaluation, and estimation of breeding and economic value of game animals. This specific knowledge is the base for further education in the field of practical forensics, and enabled attendants to recognize game species and body parts. Furthermore, this course facilitate students with acquirement of game animals' life habits, social structure and hierarchy in nature, representing in the same time the base for understanding of peculiarities of breeding technologies (natural and farm) of large and small game. Obtained knowledge is further an ethologic fundament that enables understanding and fulfillment of animal welfare during the keeping and manipulation of game species. In know-how sense it is necessary craft for development of specific skills for game manipulation (catching, immobilization, transport, etc.), assessment of wildlife age and condition of certain species, estimation of therapeutic dose and reduction of risks for personnel. From the epizootiological point of view it is necessary to understand dispersion and migration of wildlife with the goal to reduce interactions with livestock.</p>		
2.2. Course enrolment requirements and entry competences required for the course	None		
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>Whit this program, students acquire the skills necessary to develop the ability to estimate the age, gender and economic value of all types of game animals. At the same time it is the basis for further training in identifying wildlife species and its parts for the expertise with which the veterinarians encounter in practice. Also these classes through programs that inform students about life habits, social structure and hierarchy of wild species in nature is the basis of understanding the specifics later farming technology (natural or farm) large and small game.</p>		
2.4. Learning outcomes expected at the level of the course	<p>Identify and group all kinds of game species in Croatia by legal, technical and scientific categories Judged the most important characteristics of mammals and birds classes that include all kinds of wildlife in Croatia</p>		

(4 to 10 learning outcomes)	<p>Correctly estimate the economic value of all (small and large) game species in Croatia</p> <p>Categorize big game species with regard to gender and age</p> <p>Identify traces of wildlife in nature</p> <p>Distinguish protected from unprotected species of game birds</p>					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1. Introduction (establishment of game zoology in Croatia; game taxonomy; mammals; artiodactyls); 2. Ruminants: Deer (mammals: morphology and biology, antlers, <i>Plesiometacarpalia</i> and <i>Telemetacarpalia</i>, red deer, roe deer); 3. Ruminants: Family <i>Bovidae</i> (morphology and biology; horns: chamois, mouflon, ibex, vertical and seasonal migration); 4. Determination (<i>Bovidae</i> and <i>Cervidae</i>: recognition of game body parts, sex and age determination; teeth morphology in vertebrates); 5. Omnivores and carnivores: <i>Suidae</i> and <i>Ursidae</i> (morphology and biology; wild boar; brown bear); 6. Lagomorphs and rodents (<i>Leporidae</i>: brown hare; rabbit; differences in dentition; <i>Rodentia</i>: dormice; beaver; morphology and biology; hibernation); 7. Carnivores (Family <i>Canidae</i>: red fox; jackal; gray wolf; family <i>Felidae</i>: wild cat; lynx); 8. Family <i>Mustelidae</i> (stone marten, pine marten, weasel, badger, predation); 9. Feathered game (morphology and biology, taxonomy; hens: field hens – pheasant, quail, partridge, forest hens: capercaillie, Eurasian black grouse, Ptarmigan, hazel grouse; waterfowls: wild ducks, wild goose; water hens; woodcocks; pigeons; unprotected species).</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			-
2.8. Student responsibilities	Attending lectures (50%), exercise (70%)					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research	-	Practical training	
	Experimental work	-	Report	-	Activity	0.2
	Essay	-	Seminar essay	-	(other)	-
	Tests	0.64	Oral exam	-	(other)	-
	Written exam	0.8	Project	--	(other)	-
2.10. Grading and evaluating student work in class and at the final exam	<p>Evaluating elements:</p> <p>1. Attending lectures</p> <p>2. Attending exercises</p> <p>3. Seminar essay</p> <p>4. Commitment</p> <p>5. Knowledge shown on final exam</p>					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Blüchel, K. G. (1997): Game and Hunting – volume 2. Könemann Verlagsgesellschaft mbH, Köln, Germany			1	Dept. library, Dept. web page	
	Prior, R. (1995): The Roe Deer, Conservation of a Native Species. Swan Hill Press, Shrewsbury, UK			1	Dept. library, Dept. web page	
	Whitehead, G. K. (1993): The Whitehead Encyclopedia of Deer. Swan Hill Press, Shrewsbury, UK			1	Dept. library, Dept. web page	
2.12. Optional literature (at the	<p>1. Cabanau, L. (2001): Wild Boar in Europe. Könemann, Köln, Germany</p> <p>2. Denuc, J. P. (2001): Snipe and Woodcock. Könemann, Köln, Germany</p>					

time of submission of study programme proposal)	3. Bubenik, G. A., A. B. Bubenik (1990): Horns, Pronghorns, and Antlers. Springer-Verlag, New York Inc., USA
2.13. Quality assurance methods that ensure the acquisition of exit competences	Assessment during practical classes, independent seminary, assessment via e-quiz
2.14. Other (as the proposer wishes to add)	None

HUNTING AND NATURE PROTECTION

1. GENERAL INFORMATION			
1.1. Course teacher	Professor Zdravko Janicki, DVM, MSc, PhD	1.6. Year of the study programme	4 th , 5 th
1.2. Name of the course	Hunting and Nature Protection	1.7. Credits (ECTS)	2
1.3. Associate teachers	Professor Alen Slavica, Professor Dean Konjević, Assistant professor Magda Sindičić, DVM, PhD	1.8. Type of instruction (number of hours L + S + E + e-learning)	4L+26E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	None
2. COUSE DESCRIPTION			
2.1. Course objectives	Absolved courses in the curriculum " Hunting and nature protection " which elaborates topics from hunting methodologies and technologies, processes the shot game and manipulate the traffic from venison students acquire the necessary basic knowledge on hunting management and protection of natural habitats, as well as special knowledge which enables them to acquire the hunting diploma recognized by CHA (Croatian Hunting Association). Students who are in track ' Veterinary public health and food hygiene ', as well as the students oriented to track ' Farm animals and horses ' get to know the specifics of the exploitation, processing and trade in wildlife and its parts for the purposes of hunting and veterinary inspection. Such programs not only to be rounded knowledge and skills acquired complete a similar undergraduate amenities, but complements the knowledge of the legal provisions that regulate the cultivation and utilization of wildlife in accordance with ZOL (Hunting Act). It is assumed that students would develop their professional knowledge consideration to specific situation on the ground, consideration of legislation in the light of economic hunting practices, and rapid integration into all activities of veterinary supervision and inspection.		
2.2. Course enrolment requirements and entry competences required for the course	None		
2.3. Learning outcomes at the level of the programme to which the course contributes	The curriculum of the course" Hunting and environmental protection" in eight semester deals with hunting legislation, methods of hunting and hunting technology, and provides guidance on the proper (sustainable) game management and conservation of biodiversity in all types of habitats in the Republic of Croatia. Students are familiarized with the procedures after the game was shot (evisceration) and ways of handling and transport of meat of game animals. Thus the students who enrolled this elective course educated about the specifics in the exploitation, processing and trade in game animals and its parts for the needs of the meat industry and the hunting and veterinary inspection. Such programs not only to be rounded knowledge and skills acquired complete a similar undergraduate amenities, but complements the knowledge of legislative provisions such specific cultivation and exploitation of game management and breeding. The students are trained to implement and hunting management in order to preserve the original living communities. The laying of the elective course Hunting and environmental protection, and after completion of the compulsory subjects" Management and Breeding" which is heard in the VII semester,		

	participants recognized national hunting exam and they are entitled to receive a diploma from hunting Croatian Hunting Association.					
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Appoint and define the legal regulations related to hunting and nature protection</p> <p>Evaluate the basic requirements for capability evaluation of habitat and hunting grounds</p> <p>Forming plan skilled technical and economic regulation of hunting grounds (areas)</p> <p>Formulate nature protection requirements in preparing the HMP (hunting-economic fundamentals) and the basics of game management in the NP and NPs (national parks and nature parks)</p> <p>Handle hunting weapons and safe shooting</p> <p>Proper choose the technique of hunting with regard to the type of game, the obligation of using hunting dogs and the number of participants in the hunt</p> <p>Demonstrate the proper procedure with the shot game</p> <p>Properly assessments of the trophies of big game species</p>					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1. Evolution of hunting (Definition of hunting; Development of hunting through human history; Present-time hunting, Customs and ethics in hunting); 2. Regulations (Hunting Law; Law on Nature Protection; Hunt, hunting season and poaching; Law on Weapons); 3. Technical objects and instruments in the hunting grounds (Raised stand and hunting screen; Solid traps for live-trapping, Transport cages and boxes; Nets for live-trapping; Agriculture mechanization; Maintenance); 4. Hunting methods (Individual hunting; Hunting in groups; Traps and poisons; Safety measures in hunting); 5. Hunting dogs (Hunting with dogs; Classification of hunting dogs); 6. Non-conventional methods of hunting (Falconry, Archery, Trapping, Hunting "par force"); 7. Venison (Procedure with shot game; Shooting of game and outage of venison; Wounding and partial bleeding; Cooling; Transport), 8. Hunting weapons (Fire-arms; Hunting ammunition; Hunting optics; Safe handling, keeping and transporting of the weapons); 9. Essential ballistic (Inner, outer and on target ballistic; Types of projectiles, velocity and game biomass; Types of gun-powder); 10. Marking the game (Marking and tracking the game in rearing and transport); 11. Trophy evaluation (Trophies through human history; Term trophy – definition; Trophies according to the species; CIC; Economical value, International transport).</p>					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input checked="" type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			-
2.8. Student responsibilities	Attending lectures (50%), exercise (75%)					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research	-	Practical training	
	Experimental work	-	Report	-	Activity	0.2
	Essay	-	Seminar essay	-	(other)	-
	Tests	-	Oral exam	0.8	(other)	-
	Written exam	0,64	Project	--	(other)	-
2.10. Grading and evaluating student work in class and at the final exam	<p>Evaluating elements:</p> <ol style="list-style-type: none"> 1. Attending lectures 2. Attending exercises 3. Practical work 4. Commitment 5. Knowledge shown on final exam 					

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	S. D. Schemnitz et all (1980): Wildlife Management Techniques Manual (4th Edition), The Wildlife Society, Washington, USA	1	Dept. library, Dept. web page
	Bluchel et all (1997): Game and Hunting (Vol. I & II), Imago Publishing Ltd, Germany	1	Dept. library, Dept. web page
	D. J. Crump et all (2007): Into the wilderness (Special Edition), The National Geographic Society, Washington, USA	1	Dept. library, Dept. web page
2.12. Optional literature (at the time of submission of study programme proposal)	1. H. Angele t all (1985): Havens of the Wild, RDS & Pegasus Association, Orbis Publishing, London, UK 2. Rossignol C., Caccivio A (1999): Guide to Hunting Dogs, Konemann VerlagsgesellschaFT MbH, Germany 3. A. E. Hartink (1998): Encyclopedia of shotguns & other game guns, REBO Productions, The Netherlands 4. K. Davies (1992): The better shot, Quiller Press, Shrewsbury, England		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Assessment during practical classes, assessment via e-quiz		
2.14. Other (as the proposer wishes to add)	None		

HYGIENIC QUALITY OF GAME MEAT

1. GENERAL INFORMATION			
1.1. Course teacher	assoc. prof. Nevijo Zdolec, PhD	1.6. Year of the study programme	V/VI
1.2. Name of the course	Hygienic Quality of Game Meat	1.7. Credits (ECTS)	2
1.3. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, assoc. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	11+5+10
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1. 10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1 Course objectives	The aim of the subject is to make the students well acquainted with all the matters relative to the hunted and bred game, either large or small game and game birds, and in particular with the procedures applied in the processing of their meat. The acquired knowledge is specific and applicable in the procedures of veterinary control of hunted (and bred) game and their meat, particularly with respect to hunted and bred game handling, storage, processing and cutting of game meat, and possibilities of production of game meat products.		
2.2.. Course enrolment requirements and entry competences required for the course	The course can enroll only students of study track "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Knowing the specifics of hygiene and quality of game meat within the activities of veterinary public health and food safety.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	By the completion of the course students should be able to: - interpret the results of testing of hygienic quality of game meat - know the legislation in the field of hunted and/or wild game hygiene - differ the type of game farming: hunted and/or wild game - explain the organization of veterinary controls in processing, storage and transport of game meat		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Composition of game meat (physical and chemical properties, chemical composition, and biological value of game meat). 2. Legal regulations and legislation (Laws and by-laws). 3. Hunted and bred game and their meat (Large and small game and game birds). 4. Storage, treatment and cutting of game meat (Evaluation of game meat quality). 5. Game meat products (Different types of meat products)		

	6. Game welfare during transport and slaughtering					
2.6.Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities	Students are required to attend all forms of teaching the subject.					
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activites	0,2
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam	0,8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	ACTIVITIES		MINIMAL SCORE		MAXIMAL SCORE	
	Lecture attendance		3		6	
	11 hours of lectures (coefficient: 0,55)		Student must attend 6 hours of lectures in order to gain 3 points		11 x 0,55 = 6 points	
	Exercise attendance		4		6	
	5 hours of exercises (coefficient: 1,2)		student must attend 3 hours of exercises in order to gain 4 points		5 x 1,2 = 6 points	
	Seminars attendance		4		6	
	10 hours of seminars (coefficient: 0,6)		student must attend 7 hours of seminars in order to gain 4 points		7 x 0,6 = 6 points	
	Activity at exercises and seminars		5		10	
	10 oral questions (1 points each)		5 correct answers on asked questions			
	Continuous knowledge checking		20		32	
1 written exams, 8 questions		A student must give correct answers to		8 correct answers x 4 = 32 points		

	1 question = 4 points	5 questions in order to gain 20 points	
	Final exam	24	40
	Oral exam, 10 questions. 1 question = 4 points	A student must give correct answers to 6 questions in order to gain 24 points	10 correct answers x 4 = 40 points
2.11. Required literature (available in the library and via other media)	Title		Number of copies in the library
			Availability via other media
	D.S. Collins, R. J. Huey (2015): Gracey's Meat hygiene. 11th edition. A John Wiley & Sons, Ltd., Publication, 2015.		pdf
	Paulsen P., A. Bauer, F. J. M. Smulders (2017): Game meat hygiene. Wageningen Academic.		pdf
2.12. Optional literature (at the time of submission of study programme proposal)	Professional and scientific papers related to the game meat hygiene.		
2.13. Quality assurance methods that ensure the acquisition of exit competences	Assessment during exercises and seminars		
2.14. Other (as the proposer wishes to add)			

HYGIENE AND QUALITY OF POULTRY MEAT

1. GENERAL INFORMATION			
1.1. Course teacher	prof. Lidija Kozačinski, PhD	1.6. Year of the study programme	V/VI
1.2. Name of the course	Hygiene and quality of poultry meat	1.7. Credits (ECTS)	2
1.4. Associate teachers	prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD assoc. prof. Nevijo Zdolec, PhD Tomislav Mikuš, PhD Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	4+14+8
1.5. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.10. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	Scope of the subject is to broaden the previously acquired knowledge in the field of veterinary-sanitary inspection of poultry meat. It enables further education of post-graduate students for their future expert work in the field of veterinary-sanitary inspection of poultry meat. By a thorough approach to evaluation of quality and shelf life of poultry meat it will be possible to acquire knowledge and skills needed for subsequent management of production and quality of poultry meat.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enroll only students of orientation "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Knowing the specifics of hygiene and quality of poultry meat within the activities of veterinary public health and food safety.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - know the technological process of slaughtering of poultry - to distinguish certain categories of poultry meat and poultry meat products - explain the meaning of veterinary inspection (control and / or monitoring) of poultry meat - interpret the results of microbiological examination of poultry 		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>1. Organisation of the production process (Technological process of the slaughtering processing of poultry. Technological errors of the post mortem aetiology on poultry meat. Possibilities of cross-contamination of poultry meat with food-borne microorganisms).</p> <p>2. Evaluation of quality of poultry meat on the slaughtering line (Welfare at the time of slaughter, Veterinary-sanitary inspection of poultry meat. Evaluation of the hygienic quality of poultry meat for human consumption. Classification and categorisation of poultry meat).</p> <p>3. Poultry meat quality (Impact of slaughter welfare on poultry meat quality, Evaluation of freshness and shelf life of poultry meat. Microbiological analysis of poultry meat).</p> <p>4. Poultry meat products (Shelf life and sensor evaluation of quality of the poultry meat products. Boneless poultry meat. Comminuted meat and comminuted poultry meat products. Sausages, dry-cured products, cans and finished products).</p>					
2.6. Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	x independent assignments <input type="checkbox"/> multimedia and the internet x laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Students are required to attend all forms of teaching the subject.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research		Practical training	
	Experimental work		Report		Activity	0.2
	Essay		Seminar essay		(other)	
	Tests	0.64	Oral exam	0.8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	COEFFICIENT	MINIMAL NUMBER OF POINTS	MAXIMUM NUMBER OF POINTS		
	Attending lectures	1.5	3	6		
	The total of 4 lecture hours	6:4=1.5	3:1,5=2 In order to gain minimal 3 points a student must attend 2 lecture hours. Attending one lecture hour is evaluated 1.5 point			
	Attending exercises	0.429	4	6		
Total of 14 exercise hours	6:14=0.429	4:0,429=9,324 (9)				

			a student must attend 9 exercise hours In order to gain the minimal number of points (4), a student must attend 9 exercise hours.		
	Attending seminars	0.75	4	6	
	Total of 8 seminar hours	6:8=0.75	4:0.75=5.33 (5) a student must attend 5 seminars In order to gain the minimal number of points (4), a student must attend 5 seminars. Attending one seminar hour is evaluated 0.75 point.		
	Participation at Exercises and seminars		5	10	
	Seminare prepared and held = 3 points Verbal response during exercises = 4x1 point Positive verbal response during seminars = 3x1 point		a student must gain minimal 5 points Correct oral responses during exercise and seminars. At exercises and seminars, the student can be asked or call for an answer.		
	Continuous knowledge checking	1	20	32	
	1 colloquium 8 questions 1 question = 4 points	32:32=1	a student must gain minimal 20 points During the course continuous knowledge checking will be done with 1 preliminary exam (8 questions). Each correct answer is worth 4 points. The student must answer minimum		

			5 questions to gain minimal 20 points. In case a student answers less than 5 questions at a preliminary exam, he/she must retake the preliminary exam, which will be organised in the end of round.	
	Final exam	1	24	40
	Oral exam 10 questions 1 question = 4 points	40:40=1	a student must gain minimal 24 points The final exam covers all the results of monitoring activities during class. The exam is oral. Students should answer on 10 questions. The correct answer is scored with 4 points. The minimum number of points is 24.	

	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	Galanakis, C. M. (2019): Sustainable Meat Production and Processing. Academic Press, London, UK.		PDF
	Gregory, N. G. (2007): Animal Welfare and Meat Production, 2 nd Edition. CABI International, Oxfordshire, UK	1 copy	
	Herenda, D. C., D. A. Franco (1996): Poultry diseases and meat hygiene. Iowa State University Press, 1996.	1	
	Mead, G. C. (2004): Poultry meat processing and quality. Woodhead Publishing Limited, Cambridge, UK.		PDF
	Richardson, G.C. Mead (eds) (1999): Poultry meat science. CABI Publishing, Oxfordshire, UK.	1	
	Material and notes from lectures		
	2.12. Optional literature (at the time of submission of study programme proposal)	Pearson, A. M., T. R. Dutson (1995): Advances in Meat Research - Volume 10 HACCP in Meat, Poultry and Fish Processing. Blackie Academic & Professional, Glasgow, UK.	

	<p>Kerry, J. P., D. Ledward (2009): Improving the sensory and nutritional quality of fresh meat. Woodhead Publishing Limited, Cambridge, UK.</p> <p>Kerry, J. P., J. F. Kerry (2011): Processed meats Improving safety, nutrition and quality. Woodhead Publishing Limited, Cambridge, UK.</p> <p>Garcia Pinillos, R. (2018): One Welfare A Framework to Improve Animal Welfare and Human Well-being. CABI International, Oxfordshire, UK.</p> <p>Directives EU</p>
2.13. Quality assurance methods that ensure the acquisition of exit competences	Assessment during exercises and seminars
2.14. Other (as the proposer wishes to add)	

HYGIENE AND QUALITY OF FISH MEAT

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Lidija Kozačinski, PhD	1.6. Year of the study programme	V/VI
1.2. Name of the course	Hygiene and Quality of Fish Meat	1.7. Credits (ECTS)	2
1.3. Associate teachers	Prof. Lidija Kozačinski, PhD, prof. Željka Cvrtila, PhD, assoc. prof. Nevijo Zdolec, PhD, Tomislav Mikuš, PhD, Marta Kiš, DVM	1.8. Type of instruction (number of hours L + E + S + e-learning)	9+6+12
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.10. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	20%
2. COUSE DESCRIPTION			
2.1. Course objectives	After audit of the course, a student will complete one's own already acquired knowledge of the major, obligatory subject Hygiene and technology of foodstuffs. The subject explains in details individual parameters of evaluation of health safety of fish. Thus, the students will be able to perform independently the evaluation of the safety of fish with the use of modern methods of evaluation of the quality, freshness, shelf life and hygienic quality of fish. The acquired knowledge is specific and applicable in activities related with veterinary inspection and control in the production and trade of fish, and with veterinary public health.		
2.2. Course enrolment requirements and entry competences required for the course	The course can enrol only students of orientation "Hygiene and technology of animal food and veterinary public health"		
2.3. Learning outcomes at the level of the programme to which the course contributes	Knowing the specifics of hygiene and quality of fish within the activities of veterinary public health and food safety		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully completing this course the student will be able to: <ul style="list-style-type: none"> - know the composition and properties of fish - distinguish certain categories of fish - interpret the results of microbiological analysis of fish - explain the significance of the findings of parasites, heavy metals and other chemical constituents in assessing the health of fish 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<ol style="list-style-type: none"> 1. Fish as food product (Composition and properties of fish. Categorisation of fish). 2. Welfare of fish and influence on quality of fish meat. 3. Evaluation of shelf life of fish (Stunning of fishes. Post-mortem changes in fish (sensory, autolytical, bacterial changes, lipid oxidation and hydrolysis). Influence of the storage temperature on the quality of 		

	fish (fresh, frozen, salted and smoke-treated fish, comminuted fish meat); Evaluation of fish quality. 4. Microbiological quality of fish and fish products (Microbiological procedures in the evaluation of the fish freshness. Natural microflora of fish. Specific spoilage microorganisms. Contamination of fish with pathogenic bacteria). 5. Safety and hygienic quality of fish (Fish parasites as causal organisms of zoonoses. Procedures for determination of the presence of larvae of Anisakis spp. Chemical risks. Finding of heavy metals in fish. Histamine. Biotoxins. Ciguatoxin.)				
2.6. Format of instruction:	x lectures x seminars and workshops x exercises <input type="checkbox"/> on line in entirety x partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments x multimedia and the internet x laboratory x work with mentor <input type="checkbox"/> (other)	2.7. Comments:		
2.8. Student responsibilities	Students are required to attend all forms of teaching the subject.				
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.3 6	Research		Practical training
	Experimental work		Report		Activities 0.2
	Essay		Seminar essay		(other)
	Tests	0.6	Oral exam	0.8	(other)
	Written exam		Project		(other)
2.10. Grading and evaluating student work in class and at the final exam	TYPES OF ACTIVITIES	COEFFICIENT	MINIMAL NUMBER OF POINTS	MAXIMUM NUMBER OF POINTS	
	Attending lectures	0.67	3	6	
	The total of 9 lecture hours	6:9=0.6667	a student must gain minimal 3 points In order to gain minimal 3 points a student must attend 5 lecture hours. Attending one lecture hour is evaluated 0.66 point		
	Attending exercises	1	4	6	
Total of 6 exercise hours	6:6=1	4:1=4 a student must attend 4 exercise hours Attending one exercise hour is validated 1 point. In order to gain the minimal number of points (4), a student			

			must attend 4 exercise hours.	
	Attending seminars	0.5	4	6
	Total of 12 seminar hours	6:12=0.5	4:0.5=8 a student must attend 8 seminar hours Attending one seminar hour is validated 0.5 point. To achieve the minimum number of points (4), the student must be present at 8 hour of seminars.	
	Participation at exercises and seminars	1	5	10
	Seminare prepared and held = 3 points Verbal response during exercises = 4x1 point Positive verbal response during seminars = 3x1 point	10:10=1	a student must gain minimal 5 points (Correct oral responses during exercise and seminars - During exercises and seminars, students may be asked or call for a response)	
	Continuous knowledge checking		20	32
	1 colloquium 8 questions 1 question = 4 points	32:32=1	a student must gain minimal 20 points During the course continuous knowledge checking will be carried out by one colloquium (8 questions). Each correct answer carries 4 points. The student must answer at least 5 questions, thereby defining a minimum number of points (20) that a student must collect. If student answered less than five questions retake colloquium will be	

2.14. Other (as the proposer wishes to add)	
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PARASITIC ZONOTIC DISEASES

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Albert Marinculić	1.6. Year of the study programme	3 rd
1.2. Name of the course	Parasitic zoonotic diseases	1.7. Credits (ECTS)	2
1.3. Associate teachers	Assistant lecturer Franjo Martinković	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+20+0+0
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.5. Status of the course		1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	Level 2, 50%
2. COUSE DESCRIPTION			
2.1. Course objectives	Students will be aknowledged with the routes of infections in humans which is very important for the prevention. Since control measures of some parasitic zoonotic diseases are prescribed by legislative rules, the course aims to provide the education of future veterinarians previously aknowledged through the course Parasitology and parasitic diseases in order to give an active contribution for the prevention and education of animals owners. Seminars will include cases with special emphasis on routes of infection and prevention.		
2.2. Course enrolment requirements and entry competences required for the course	Regular knowledge achieved throughout the veterinary study with the special emphasis on veterinary parasitology.		
2.3. Learning outcomes at the level of the programme to which the course contributes	By the end of this course students should be able to demonstrate: detailed knowledge and understanding of the biology, life cycles, epidemiology and risk factors, clinical signs of the disease, diagnosis, prevention and control of zoonotic parasites detailed knowledge and understanding of the role of the veterinarian for the prevention of human risks caused by animal parasites		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Understanding of biology and ecology of parasites and vectors that are causing and transmitting zoonotic parasites Understanding of spreading ways of parasitic zoonotic diseases Understanding of human risks for zoonotic parasites Improving of skills and abilities in establishing proper control methods Understanding of modern trends in prevention of parasitic zoonotic diseases		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES</p> <p>1st week Introduction (meaning of the term zoonotic disease, public health significance of parasitic zoonotic diseases, epidemiology and epizootiology of parasitic zoonotic diseases, routes of infections, infective stages, diagnostic stages, preventive measures, aberrant and ocasional parasite)</p> <p>2nd week Important zoonotic parasites related to routes of infection and preventive measures, food and waterborne infections, infection after ingestion of tissues from intermediate hosts</p> <p>3rd week Feco-oral route of infection (contamination of food and water) - giardiosis, cryptosporidiosis</p> <p>4th week Toxocariasis - VLM, cysticercosis, toxoplasmosis, hydatidosis</p> <p>5th week Foodborne infections with developmental stages of parasites (trichinelosis, teniasis, toxoplasmosis)</p> <p>6th week Trematode infections, anisakiasis, legislation</p> <p>7th week Arthropods as vectors and control of vector borne diseases, vector borne zoonotic parasitic diseases (leishmaniasis)</p>		

	8th week <i>Dirofilaria</i> infections, Chagas disease, <i>Thelazia</i> infections 9th week Contagious zoonotic diseases, ectoparasites (sarcoptic mange, <i>Cheyletiella</i> infection, fleas). 10th week Ancylostomiasis-CLM, strongyloidosis, occasional (aberrant) parasites in man. (<i>Dypilidium</i> infections, ophthalmomyiasis- <i>Oestrus ovis</i> , trombiculiasis, swimmer's itch). Delusional parasitosis - Ekbom syndrome SEMINARS Case reports of important parasitic zoonotic diseases					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	During the Course a student must attend at least 5 lecture lessons. During the course session the student must be actively involved in at least 7 seminars. At the final exam a student answers the questions orally.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,5	Research		Practical training	
	Experimental work		Report		E learning tasks	0,5
	Essay		Seminar essay		(other)	
	Tests		Oral exam	1	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Coursework will be evaluated according to the results obtained at the final exam. The final exam will be comprehensive and entirely oral.					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Human Parasitology, Burton Jerome Bogitsh, Clint Earl Carter, Thomas N. Oeltmann Academic Press, 2005			1		
	Clinical Parasitology, P. Chakraborty, New Central Book Agency (P) Limited, 2004			1		
	Principles and Practice of Clinical Parasitology: Stephen Gillespie, Richard D. Pearson, Wiley, 2001			1		
2.12. Optional literature (at the time of submission of study programme proposal)	Practical guide to diagnostic parasitology, Lynne Shore Garcia, ASM Press, 1999 Recent scientific articles concerning important parasitic zoonotic diseases					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Course information documentation, annual monitoring reports, student feedback by student questionnaire that cover all aspects of the course.					
2.14. Other (as the proposer wishes to add)						

PHYSIOLOGY OF BIRDS

1. GENERAL INFORMATION			
1.1. Course teacher	Full Prof. Suzana Milinković Tur	1.6. Year of the study programme	2
1.2. Name of the course	Physiology of Birds	1.7. Credits (ECTS)	1
1.3. Associate teachers	Prof. Jasna Aladrović, Assistant prof. Ivona Žura Žaja, Assistant prof. Ana Shek Vugrovečki, Assistant prof. Lana Pađen	1.8. Type of instruction (number of hours L + S + E + e-learning)	L12+E3
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine, Faculty of Veterinary medicine, University of Zagreb	1.9. Expected enrolment in the course	10
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	After the successful completion of the elective subject Physiology of birds, students will acquire knowledge peculiarities of the physiology of birds and gain knowledge of the physiology of reproduction, digestion, respiration, excretion, blood and circulatory system, metabolism, neurophysiology and endocrinology, and behavior of birds.		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	Students during class acquire knowledge about the basic peculiarities of the comparative physiology of birds, and obtained knowledge provide a good introduction to the knowledge of breeding and keeping of birds, and birds diseases.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully completing this course the student will be able to: <ul style="list-style-type: none"> - explain the peculiarities of the comparative physiology of organ systems of birds - interpret the function of various organ systems in different physiological conditions - explain and relate the regulatory mechanisms of physiological processes in birds - recognize and associate the importance of knowing the physiology of birds with breeding, keeping and diseases of birds 		

2.5. Course content broken down in detail by weekly class schedule (syllabus)	Methodological unit / course content		class schedule (lectures + exercises + seminars)		
	Physiology of reproduction in birds, egg and its composition, the development of egg laying, the male reproductive processes, nesting, embryonic development, molt		L3		
	Physiology of digestion, the characteristics of the digestive tract in different species of birds given the diet		L2		
	Physiology of respiration, and cardiovascular system with hematologic characteristics		L2 + E3		
	Physiology of excretion, regulation of body temperature		L1		
	Physiology changes of the substance		L1		
	Neurophysiology and endocrinology with the physiology of behavior		L2		
	Physiology of flying		L1		
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> independent assignments	2.7. Comments:		
	<input type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet			
	<input checked="" type="checkbox"/> exercises	<input type="checkbox"/> laboratory			
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor			
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)			
	<input type="checkbox"/> field work				
2.8. Student responsibilities	Student obligations are defined with the Regulations on the integrated undergraduate and graduate Study of Veterinary Medicine, University of Zagreb. Students are required to attend classes (according to the mentioned Regulation) and taking the final (oral) exam.				
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.1 2	Research	Practical training	
	Experimental work		Report	Activity during lectures	
	Essay		Seminar essay	Activity during exercises	0.16
	Tests	0.3	Oral exam	(other)	
	Written exam		Project	(other)	
2.10. Grading and evaluating student work in class and at the final exam	Activities	Minimum number of points	Maximum number of points		
	Class attendance	3	6		
	12 hours of lectures	(coefficient = 0,5) 6 x 0,5 = 3	(coefficient = 0,5) 12 x 0,5 = 6		
	Exercises attendance	4	6		
	3 houes of exercises	(coefficient = 2) 2 x 2 = 4	(coefficient = 2) 3 x 2 = 6		

	Activity during exercises	9	16
	Continuous evaluation	20	32
	Oral evaluation		
	Final exam	24	40
	Oral 1 correct answer = 8 points	3 correct answers	5 correct answers
	In total	60	100
2.11. Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Sturkie's Avian Physiology. Ur.: C. G. Scanes, 6th edition, Springer Verlag. New York, Berlin, Heidelberg, Tokyo, 2015.	1 book in the Library of the Department of Physiology and Radiobiology	-
	Sjaastad Ø. V., O. Sand, K. Hove: Physiology of Domestic Animals. The 12nd ed. Scandinavian veterinary press, 2010.	1 book in the Library of the Department of Physiology and Radiobiology	-
	Schalm's veterinary hematology. – Ed.: Weiss, D. J., J. Wardrop, 6th ed., Blackwell Publishing Ltd, 2010.	1 book in the Library of the Department of Physiology and Radiobiology	
	Nelson, R. J.: An Introduction to Behavioral Endocrinology. 4th edition, Sinauer Associates, INC. Sunderland, Massachusetts, 2011.		
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Clark, P., W. S. J. Boardman, S. R. Raidal: Atlas of Clinical Avian Hematology. Wiley-Blackwell, UK, 2009.</p> <p>Bradshaw, D.: Vertebrate ecophysiology. An introduction to its principles and applications. Cambridge University Press, Cambridge, UK, 2003.</p>		

2.13. Quality assurance methods that ensure the acquisition of exit competences	Students' work will be monitored through the activity during lectures and exercises, and continuous (oral) evaluation. At the end of teaching the knowledge of students will be verified by a final (oral) exam.
2.14. Other (as the proposer wishes to add)	

PHYSIOLOGY OF AMPHIBIANS AND REPTILES

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Jasna Aladrović	1.6. Year of the study programme	2
1.2. Name of the course	Physiology of Amphibians and Reptiles	1.7. Credits (ECTS)	1
1.3. Associate teachers	Assistant prof. Lana Pađen Assistant prof. Ivona Žura Žaja, Assistant prof. Ana Shek Vugrovečki	1.8. Type of instruction (number of hours L + S + E + e-learning)	L10+E5
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate Veterinary Medicine study, Faculty of Veterinary Medicine, University of Zagreb	1.9. Expected enrolment in the course	
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	To introduce students to the characteristics of physiology of amphibians and reptiles: physiology of reproduction, digestion, respiration, hematology characteristics and biochemical parameters. The course gives students a basic understanding of the regulation of homeostasis in amphibians and reptiles: neurophysiology, endocrinology and oversight of structure and function of special sensory organs. Students learn about thermoregulation in amphibians and reptiles, as well as about the specificities of metabolic processes.		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	During class students will learn about basic comparative characteristics of amphibians and reptiles physiology. The course follows after the Physiology of Domestic Animals course, and represents a good introduction to the knowledge of breeding, keeping and diseases of amphibians and reptiles.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - understanding of the biology of amphibians and reptiles - understanding of the basics of breeding in amphibians and reptiles, and methods of preserving the health of these animals - understanding of thermoregulation and maintenance processes in the homeostasis of amphibians and reptiles - analysis of health conditions, rearing and feeding of amphibians and reptiles 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	The development of life in the water, maintenance of homeostasis in the water, adjusting to the life on land. Physiology of reproduction, sexual cycle, the female and male reproductive organs, viviparity , ovoviviparity , developing tadpoles, metamorphosis, the development of the offspring of lizards. Physiology of digestion, food intake,		

	physiological characteristics of digestion of amphibians and reptiles. Respiratory physiology, physiology of the vascular system with hematologic characteristics and excretion in amphibians and reptiles. Neurophysiology and endocrinology, special sensory organs. Basic characteristics of metabolism, <u>poikilothermic</u> .					
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.18	Research		Practical training	
	Experimental work		Report		Activity (other)	0.1
	Essay		Seminar essay		(other)	
	Tests	0.32	Oral	0.4	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	During the course students will be evaluated through their activity on lectures. Final exam: oral exam.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Campbell, T. W. (2015): Exotic Animal Hematology and Cytology.4 th Ed., Wiley Blackwell, UK, SAD.				1	
	Marcus, C. L. (1983): Amphibien und Reptilien in Heim, Labor und Zoo. Ferdinand Enke Verlag, Stuttgart.					
	Pough, H. F., M. R. Andrews, E. J. Cadle, L. M. Crump, H. A. Savitzky, D. K. Wells (1998): Herpetology. Prentice Hall, New Jersey.				1	
	Schmidt-Nielsen, K. (1997): Animal Physiology, Adaptation and environment. Cambridge University Press, Cambridge.				1	
2.12.Optional literature (at the time of submission of study programme proposal)	Kardong, V. K. (1995): Vertebrates. Wm. C. Brown Publishers. Cogger, G. H., G. R. Zweifel (1998): Encyclopedia of reptiles and amphibians. Natural world.					

2.13. Quality assurance methods that ensure the acquisition of exit competences	Students anonymous poll.
2.14. Other (as the proposer wishes to add)	

PIGEON KEEPING AND BREEDING

1. GENERAL INFORMATION			
1.1. Course teacher	Željko Pavičić, DVM, PhD, Full Professor	1.6. Year of the study programme	III
1.2. Name of the course	Pigeon Keeping and Breeding	1.7. Credits (ECTS)	2
1.3. Associate teachers	Kristina Matković, PhD, Full Professor; Mario Ostović, PhD, Assoc. Professor	1.8. Type of instruction (number of hours L + S + E + e-learning)	L 0+ S 15+ E 15
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	In our country pigeon breeding presents a certain part in keeping small animals. In that context, many veterinarians in their job meet that kind of bird; at the same time, people ask advice from them about pigeon breeding and keeping. Therefore the goal and aim of this optional course is about future doctors of veterinary medicine to gain basic knowledge about pigeon biological characteristics, pigeon breeding directions, recognition of certain pigeon breeds, role of feeding and diet balancing in specific pigeon categories as well as right housing and keeping of pigeons as an important factor of preventive veterinary medicine. Apart from that, pigeon meat has recently been recognised as a valuable animal origin food. For this specific purpose, pigeon breeding has been organised on smaller and bigger farms all over the world. That is why the goal of the course is that future veterinarians gain basic knowledge about specific qualities of farm pigeon breeding and the role of the branch in that kind of small animals breeding.		
2.2. Course enrolment requirements and entry competences required for the course	Passed compulsory courses Environment, Animal Behaviour and Welfare and Hygiene and Housing of Animals with average grade higher than 3,5. Mentor type of teaching, up to 3 students.		
2.3. Learning outcomes at the level of the programme to which the course contributes	-basic knowledge about pigeon biological characteristics, pigeon breeding directions, recognition of certain pigeon breeds, role of feeding and diet balancing in specific pigeon categories as well as right housing and keeping of pigeons as an important factor of preventive veterinary medicine.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successful completion of the course the student will be able to: -define basic characteristic of reproduction of pigeons -enumerate characteristics of pigeons for meat production -describe basic biological characteristic of pigeons -classify requirements considering to quality of meat of pigeons -know the basic way of how to put the ring on pigeon -make a plan of proper housing conditions for every each category of pigeons -make a difference among the most popular breeds according to external characteristic -evaluate food needs according the breed of pigeon		
2.5. Course content broken down in detail by weekly	1. Introduction; 2. Wild pigeon species; 3. Basic biological characteristics of pigeons; 4. Pigeon reproduction; 5. Pigeon ringing; 6. Pigeon breeds; 7.		

class schedule (syllabus)	Croatian authentic pigeon breeds; 8. Pigeon feeding; 9. Pigeon breeds hygiene; 10. Pigeon breeding for meat production					
2.6. Format of instruction:	<input type="checkbox"/> lectures	<input type="checkbox"/> independent assignments		2.7. Comments:		
	X seminars and workshops	<input type="checkbox"/> multimedia and the internet				
	X exercises	<input type="checkbox"/> laboratory				
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor				
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)				
	<input type="checkbox"/> field work					
2.8. Student responsibilities	1. attending exercises 2. attending seminars 3. participation at exercises and seminars 4. continuous knowledge checking 5. final exam (written)					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance		Research		Practical training	
	Experimental work		Report		Attending exercises	0,18
	Essay		Seminar essay		Attending seminars	0,18
	Continuous	0,64	Oral exam		Participation at	0,2
	Written exam		Project		Final exam	0,8
2.10. Grading and evaluating student work in class and at the final exam	Type of activities		Minimal number of points		Maximal number of points	
	attending seminars		5		9	
	attending exercises		5		9	
	participation at exercises and seminars		6		10	
	continuous knowledge checking		20		32	
	final exam (written)		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	1. Brown, D. (1995): A guide to pigeons, doves and quail: their management, care and breeding. ABK Publications, Australia.					
	Hiatt, S., J. Esposito (2000): The pigeon guide: practical breeding, training and management. Silvio Mattacchione and Co, Canada.					
	3. Lang, E. (2016): Pigeon racing. The complete pigeon racing guide. Racing pigeons breeds, loft, feeding, health, training, racing, record keeping and systems. IMB Publishing, UK.					
2.12. Optional literature (at the time of submission of study programme proposal)						

2.13. Quality assurance methods that ensure the acquisition of exit competences	Type of activities	Minimal number of points	Maximal number of points														
	Attending exercises (15 hours)	5 (coefficient 0,6) $5/0,6 = 8$ exercise hours (a student must attend minimal 8 exercise hours in order to gain minimal 5 points)	9 $9/15 = 0,6$ (coefficient 0,6)														
	Attending seminars (15 hours)	5 (coefficient 0,6) $5/0,6 = 8$ exercise hours (a student must attend minimal 8 seminars hours in order to gain minimal 5 points)	9 $9/15 = 0,6$ (coefficient 0,6)														
	Participation at exercises and seminars (10 points ¹)	6 $6/1 = 6$ (coefficient 1) (a student must collect minimal 6 points in order to gain minimal 6 points)	10 $10/10 = 1$ (coefficient 1)														
	Continuous knowledge checking (8 points ²)	20 $20/4 = 5$ (coefficient = 4) (a student must collect minimal 5 points in order to gain minimal 20 points)	32 $32/8 = 4$ (coefficient = 4)														
	Final exam (written) (40 points ³)	24 $24/1 = 24$ (coefficient 1) (a student must collect minimal 24 points in order to gain minimal 24 points)	40 $40/40 = 1$ (coefficient 1)														
	Total	60	100														
<p>1-10 points (writing of the report from field exercises (4 points)+preparation of seminar work during semester (3 points if in PP additional 3 points)</p> <p>2-8 points (8 questions, every correct answer worth 1 point)</p> <p>3-40 points (written exam - 20 questions/ 2 points for each correct answer; a student must collect minimal 24 points in order to gain minimal 24 points. On written exam student can earn maximal 40 points)</p> <p>The final grade is made on the basis of total sum of gained points as follows:</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>up to 59</td> <td>1 (F)</td> </tr> <tr> <td>60-68</td> <td>2 (E)</td> </tr> <tr> <td>69-76</td> <td>2 (D)</td> </tr> <tr> <td>77-84</td> <td>3 (C)</td> </tr> <tr> <td>85-92</td> <td>4 (B)</td> </tr> <tr> <td>93-100</td> <td>5 (A)</td> </tr> </tbody> </table>				Points	Grade	up to 59	1 (F)	60-68	2 (E)	69-76	2 (D)	77-84	3 (C)	85-92	4 (B)	93-100	5 (A)
Points	Grade																
up to 59	1 (F)																
60-68	2 (E)																
69-76	2 (D)																
77-84	3 (C)																
85-92	4 (B)																
93-100	5 (A)																
2.14. Other (as the proposer wishes to add)																	

POSITIVE IMPACT OF ANIMALS ON HUMAN HEALTH

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Denis Cvitković	1.6. Year of the study programme	First
1.2. Name of the course	Positive Impact of Animals on Human Health	1.7. Credits (ECTS)	1
1.3. Associate teachers	Prof. Damir Žubčić, Assoc. Prof. Tomislav Babić, Assoc. Prof. Tomislav Krznar, Saša Zavrtnik, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	5+5+5
1.4. Study programme (undergraduate, graduate, integrated)	Undergraduate	1.9. Expected enrolment in the course	25
1.5. Status of the course		1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	.-
2. COUSE DESCRIPTION			
2.1. Course objectives	The main group of diseases in humans that can be treated with the help of companion animal would be discussed. Also main principles of animal activity and therapy would be discussed.		
2.2. Course enrolment requirements and entry competences required for the course	-		
2.3. Learning outcomes at the level of the programme to which the course contributes	<p>Annotation: how animals can help prevent diseases, the preservation of health and treatment of diseases in humans.</p> <p>Interpretation: which category of human population and which diseases are especially favourable for treatment assisted with companion animals.</p> <p>Arranged: projects and connect different kinds of experts from other fields to treatment programs people with the help of animals.</p> <p>Point out: the needs of animals who participate in human treatment.</p> <p>Own assessment: which species are most suitable in prevention and treatment of certain disorders.</p>		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	The goal of this class is to acquaint the student with the bond and dependence that exists between humans and animals and possibilities of animal assisted therapy. The main group of diseases in humans that can be treated with the help of companion animals will be discussed. Also main principles of animal activity and therapy will be discussed.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Human-animal bond (historical review); 2. Effects of animals on human health (effects on cardiovascular and mental diseases, sociological effects); 3. Animal activity as a form of improving human health status (animal assisted activity programs); 4. Animal therapy as a form of improving human health status (animal assisted therapy programs); 5. Physical and mental needs of animals in pet therapy programs.		
2.6. Format of instruction:	lectures seminars and workshops exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:

2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,33	Research		Exercises	0,34
	Experimental work		Report		(other)	
	Essay		Seminar essay	0,33	(other)	
	Tests		Oral exam		(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Oral exam on the basis of lectures, seminar essays and exercises					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Fine, A. H.: Handbook on Animal-assisted therapy. Third Edition. Elsevier: AP. 2010.					
	Chandler, C. K.: Animal Assisted Therapy in Counseling. Second Edition. Taylor and Francis Group. 2012.					
	Pichot, T.: Animal-Assisted Brief Therapy. Taylor and Francis Group. 2012.					
2.12. Optional literature (at the time of submission of study programme proposal)	-					
2.13. Quality assurance methods that ensure the acquisition of exit competences	-					
2.14. Other (as the proposer wishes to add)	-					

REPTILE MORPHOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Full Professor Srebrenka Nejedli	1.6. Year of the study programme	Second year
1.2. Name of the course	Reptile Morphology	1.7. Credits (ECTS)	2
1.3. Associate teachers	Full Professor Damir Mihelić Assistant Professor Ana Shek Vugrovečki	1.8. Type of instruction (number of hours L + S + E + e-learning)	4+15+11
1.4. Study programme (undergraduate, graduate, integrated)	undergraduate	1.9. Expected enrolment in the course	Depending on the interest
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	Reptiles being nowadays common patients in veterinary clinics and surgeries, the subject "Morphology of reptiles" is meant to teach the students about: the systematization of reptiles; the variety of their body regions as to the locomotion, skeleton construction and musculature; fundamental differences in construction of digestion duct because of different ways of feeding, breathing and construction of respiratory organs due to the living mode (in water or on earth); construction of urinary and reproductive system; heart and blood vessels, particularly the relevant ones for blood taking; central and peripheral nerve systems and their accessibility for local anaesthesia, etc.		
2.2. Course enrolment requirements and entry competences required for the course	Appoint organ systems in reptiles, describe the structure of certain parts of the organ systems in reptiles, differentiate the morphologic characteristics of each system in reptiles, compared to organic systems in reptiles.		
2.3. Learning outcomes at the level of the programme to which the course contributes	Student content can recognize and classify it in the appropriate area. Will seek further clarification: from their mentors or literature.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Knowledge of the systematics of reptiles, knowledge of skeletal and muscular systems in reptiles, knowledge of the digestive, respiratory, nervous, endocrine, urinary and reproductive system in reptiles, knowledge of the circulatory system and for the extraction of blood in reptiles.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Systematization of reptiles and their body forms and regions as to the way of their locomotion; 2. Locomotive system (appendicular head musculature, ligaments and tendons); 3. Importance of digestion system (mouth, pharynx, oesophagus, stomach, intestines, liver, pancreas); 4. Respiratory system (lungs, trachea, breathing by skin, ways of breathing on earth and in water); 5. Blood conducting system (heart, blood and lymph circulation, blood components); 6. Urinary and reproductive system (construction of kidneys, male and female sexual organs); 7. Nerve system (dorsal spine, brain nerves, peripheral nerves, autonomic nerve system; frontal, central, posterior and small brain); 8. Endocrine system (hypophysis, epiphysis, thyroidal and parathyroidal gland, ultimobranchial gland, thymus, endocrine part of the pancreas); 9.		

	Sensory organs (eye construction, vomeronasal organ, hearing organ); 10. Skin (epithelium, derma, olfactory glands).					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research		Practical training	
	Experimental work		Report		(other)	0.1
	Essay		Seminar essay		(other)	
	Tests	0.72	Oral exam	0.8	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Guest students in the final examination grades 1-5					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	Kenneth, V. Kardong (1995): Vertebrates, comparative anatomy, funktion, evolution. Wm. C. Brown Publishers. Washington State University.				1	
	Young, J. Z. (1981): The life of vertebrates. Clarendon press. Oxford.				1	
	O 'Mallei, B. (2005): Clinical anatomy and physiology of exotic species. Elsver Saunders.				1	
2.12. Optional literature (at the time of submission of study programme proposal)	Wineken, J., Godfrey, M. H., Bels, V. (2007): Biology of turtles. CRC Press					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Passed the test.					
2.14. Other (as the proposer wishes to add)						

SELECTED CHAPTERS IN BIOMEDICAL PHYSICS FOR VETERINARIANS

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Pašić Selim	1.6. Year of the study programme	1.
1.2. Name of the course	Selected Chapters in Biomedical Physics for Veterinarians	1.7. Credits (ECTS)	2
1.3. Associate teachers		1.8. Type of instruction (number of hours L + S + E + e-learning)	20 + 10 + 0 + 0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	1
2. COUSE DESCRIPTION			
2.1. Course objectives	The aim of the course is more detailed and better understanding of important physiological processes of living organisms.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	Students will be able to use part of the physical laws for explaining and understanding of the most important physiological functions of the body of animals.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Students will better understand the role of electricity in the body of humans and animals. - Students will be considerably better understand the transport of substances in living organisms by combining the laws of electricity and thermodynamics. - Applying the laws of hydrodynamics (fluid) students will greatly enhance the understanding of blood flow and gas exchange with the environment. - Students will understand much better thermodynamic interaction of living organisms with their environment. 		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>Electricity in living organisms (sources of bioelectric potentials (voltages on the membrane of cells, heart and circulatory system, nervous system, muscles, senses, physical fundamentals electro diagnostics and devices for measurement and registration of bioelectric potentials (electromyography, electrocardiography, electroencephalography, electroretinography and electronystagmography)). (2 hours of lectures)</p> <p>Review of methods for electrical stimulation (electrical stimulation of skeletal muscles, respiratory organs, for the growth of biological tissues, and motor nerve system, pain relief). (2 hours of lectures)</p> <p>Transport of substances (active and passive transport of substances; physics transport properties of cell membranes; physical quantities associated with the capillary, the interstitial fluid and lymph; dynamic balance entering and fluid secretion; physical fundamentals of gas exchange, diffusion of oxygen and carbon dioxide through the respiratory membrane). (2 hours of lectures)</p> <p>Biophysical properties of biological fluids and gases (flow models; physical fundamentals circulation; physical fundamentals method of measuring blood</p>		

	pressure and blood flow measurement; transducers in chemical analyzes of blood; physics of diffusion of gases and partial pressures of gases, devices for measuring characteristic parameters of respiration, physical devices that measure the concentration of gases of respiration). (2 hours of lectures) Interactions thermodynamic system with the environment (physics of regulation of body temperature and its disorders; equilibrium closed-system interaction with the environment; correlation of biochemical reactions and thermodynamics of the process, ways of storing free energy using membrane; measurements in bioenergetics). (2 hours of lectures) Seminar papers of students (10 hour seminars)					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	0,0
	Experimental work		Report		Activity	0,2
	Essay		Seminar essay	0,0	(other)	
	Tests	0,64	Oral exam		(other)	
	Written exam	0,8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam						
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Web page lms.vef.hr, Internal script (lectures)				Internet	
	S. Gibilisco: Physics demystified, McGraw-Hill, New-York, 2002.			3		
G. J. Hademenos: Schaum's outline of physics for pre-med, biology and applied health students, McGraw-Hill, new-York, 1998.			3			
2.12. Optional literature (at the time of submission of study programme proposal)	Russell K. Hobbie, Bradley J. Roth: Intermediate Physics for Medicine and Biology, Springer, 2006.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Grading and evaluating student work in class and at the final exam					
2.14. Other (as the proposer wishes to add)						

SPECIFIC ANATOMICAL STRUCTURES OF THE LOCOMOTOR APPATARUS OF THE HORSE

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof. Martina Đuras	1.6. Year of the study programme	1 st year, 2 nd semester
1.2. Name of the course	Specific anatomical structures of the locomotor apparatus of the horse	1.7. Credits (ECTS)	1
1.3. Associate teachers	Assist. Prof. Mirela Pavić	1.8. Type of instruction (number of hours L + S + E + e-learning)	15 E
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	Application of VEF-LMS
2. COURSE DESCRIPTION			
2.1. Course objectives	The course presents the specific anatomical structures of the trunk, neck and limbs of the horse and explains their role in the static and dynamic.		
2.2. Course enrolment requirements and entry competences required for the course	Completed course "Anatomy with organogenesis of domestic animals I".		
2.3. Learning outcomes at the level of the programme to which the course contributes	Following successful completion of the course, students will be able to apply the acquired knowledge on specific anatomical structures of the locomotor apparatus of the horse during clinical courses.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Following successful completion of the course, students will be able to: list and describe specific anatomical structures of the locomotor apparatus of the horse identify clinically important structures of the locomotor apparatus of the horse		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Bones and joints of the forelimb of the horse (1 hours); 2. Bones and joints of the hindlimb of the horse (1 hours); 3. Muscles of the forelimb of the horse with special remarks on: m. serratus ventralis; m. triceps brachii; m. biceps brachii; lacertus fibrosus, m extensor carpi radialis; m. flexor digitorum superficialis; m. flexor digitorum profundus; m. interosseus medius, manica flexoria; bursae synoviales (4 hours); 4. Muscles of the hindlimb of the horse with special remarks on: m. quadriceps femoris, m. fibularis tertius, m. flexor digitorum pedis superficialis, m. flexor digitorum pedis profundus, dorsal patellar luxation; bursae synoviales; vaginae synoviales tendines (3 hours); 5. Muscles of the back, neck and the abdominal wall in the horse with special remarks on: m. rectus abdominis, lig. accessorium ossis femoris; ligamentum nuchae (3 hours); 6. Supportive mechanism of the forelimb joints (1 hour), 7. Supportive mechanism of the hindlimb joints (1 hour), 8. Supportive mechanism of the vertebral column (1 hour).		

2.6. Format of instruction:	<input type="checkbox"/> lectures	<input type="checkbox"/> independent assignments	2.7. Comments:			
	<input type="checkbox"/> seminars and workshops	<input type="checkbox"/> multimedia and the internet				
	X exercises	<input type="checkbox"/> laboratory				
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor				
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)				
	<input type="checkbox"/> field work					
2.8. Student responsibilities	Students are expected to attend dissection exercises.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.18	Research		Practical training	0.1
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	0.32	Oral exam	0.4	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity		Minimum number of points		Maximum number of points	
	Lecture attendance		3		6	
	Practical training attendance		8		12	
	Participation in the practical training		5		10	
	Tests		20		32	
	Oral exam		24		40	
	Total		60		100	
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	KÖNIG, H. E., H.-G. LIEBICH (2007): Veterinary anatomy of domestic mammals, Textbook and color atlas. 3 rd Ed. Schattauer, Stuttgart, New York					
	DYCE, K. M., W. O. SACK, C. J. G. WENSING (2010): Textbook of veterinary anatomy. 4 th Ed. Saunders Elsevier, Philadelphia.					
	NICKEL, R., A. SCHUMMER, E. SEIFERLE (1986): The locomotor system of the domestic mammals. Volume I. Verlag Paul Parey, Berlin, Hamburg.					
2.12. Optional literature (at the time of submission of study programme proposal)						
2.13. Quality assurance methods that ensure the acquisition of exit competences	Final oral exam					
2.14. Other (as the proposer wishes to add)						

SPORT AND WORKING ANIMALS

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Nika Brkljača Bottegaro	1.6. Year of study	5
1.2. Name of the course	Sport and Working Animals	1.7. Credit value (ECTS)	2
1.3. Associate teachers	Prof. Boris Pirkić; Prof. Ljubo Barbić; Prof. Ivana Kiš; Prof. Nikica Prvanović Babić; Assist. Prof. Zoran Vrbanac; Assist. Prof. Vladimir Stvanović; Assist. Prof. Jelena Gotić; Assist. Prof. Nika Brkljača Bottegaro.	1.8. Type of instruction (number of hours L+S+E+e-learning)	8+6+16
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	2 h E-learning (6%)
2. COURSE DESCRIPTION			
2.1. Course objectives	Course is focused on diseases of horses used in different equestrian and canine sports, as well as police, hunting and other working dogs and male animals used for semen production in artificial insemination centers. Students will have the opportunity to visit different equine competitions; police, army, training centers for sport and working dogs, simulation of sampling for doping in horses etc. After completing this subject they will develop competencies for an analytical and precise approach for specific diseases of sport and working animals. Furthermore, they will learn how to use such animals in reproduction keeping in mind all endogenous and exogenous factors involved.		
2.2. Enrolment requirements and required entry competences for the course			
2.3. Learning outcomes at the level of the study programme to which the course contributes	Majority of the course will be case oriented and organized on the field. It will give students practical experience combined with self explanatory examples designed for developing clinical skills and competences on general point of view. It is suitable for both small and large animal oriented students since majority of cases involved in subject will be dogs and horses.		
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	<ul style="list-style-type: none"> -practical experience in different equine and canine sport disciplines -practical experience in organisation and treatment of male animals in AI centers -practical experience in simulation of equine doping control -adequate treatment of sport and working animals depending of their use -adequate reproduction of sport and working animals depending of their use 		
2.5. Course content broken down in detail by weekly class	1. Equestrian sport and its influence on horse organism 2. Working and sport dogs as a veterinary patients 3. Management of AI centers 4. Horse diseases as consequence of athletic performance 5. Competitions Vet check and Doping control 7. Management of reproduction and contraceptive techniques in sport horses 8. Canine diseases and consequence of long term work 9. Reproduction, breeding and		

schedule (syllabus)	selection of sport and working dogs 10. Reproduction in senior subfertile retired sport horses 11. Professional diseases of male animals used in AI centers 12. Practical work at different competitions and in working areas for dogs and horse combined to visits to AI centers 13. Practical approach – case oriented learning on examples at Clinics of Faculty of Veterinary Medicine and under field conditions 14. Physical therapy and rehabilitation of sport animals					
2.6.Type of instruction	<input type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> online in entirety <input type="checkbox"/> mixed e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent study <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with the mentor <input type="checkbox"/> (other)		2.7.Comments:	
2.8.Student responsibilities						
2.9.Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course):	Class attendance	0,36	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	0,2	(Other--describe)	
	Tests	0,64	Oral exam		(Other—describe)	
	Written exam	0,8	Project		(Other—describe)	
2.10.Grading and evaluation of student work over the course of instruction and at a final exam	All forms of instruction are obligatory to students. Course will be finished with writing exam. They will have to write seminars and use E-learning as well.					
2.11.Required literature (available at the library and via other media)	Title			Number of copies at the library	Availability via other media	
	Conditioning sport horses (H. Clayton, SAUNDERS 2012),			1		
	Equine reproduction (McKinnon, WILLEY BLACKWELL, 2011)			1		
	Canine and feline theriogenology (Jonston, Kustritz, Olson, SAUNDERS, 2003)			1		
	Equine Sports Medicine and Surgery. 2014, 2nd ed. Hinchcliff K, Kaneps A and Geor R. Saunders.					
2.12. Optional literature (at the time of the submission of the study programme proposal)						
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Students will be monitored during complete education process. They have obligatory seminars and final exam.					

STRUCTURE AND FUNCTION OF CELL

1. GENERAL INFORMATION				
1.1. Course teacher	Assist. Prof. Ivona Žura Žaja	1.6. Year of the study programme	2	
1.2. Name of the course	Structure and Function of Cell	1.7. Credits (ECTS)	2	
1.3. Associate teachers	Full Prof. Suzana Milinković Tur, Assistant prof. Ivona Žura Žaja, Assistant prof. Mirela Pavić, Assistant prof. Ana Shek-Vugrovečki	1.8. Type of instruction (number of hours L + S + E + e-learning)	10+7+8	
1.4. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course		
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)		
2. COUSE DESCRIPTION				
2.1. Course objectives	The elective course Structure and function of cells introduces students to the structure and function of cells of animal organisms, their differentiation and intercellular communication. Develops knowledge of the internal cellular organization, mechanisms of synthesis and action of organelles and mechanisms regulating relations with cellular environment. Students will be informed about the organization and chemical composition of the cells, cellular energetics, transport of substances through the cell membrane and the receiving and transferring messages.			
2.2. Course enrolment requirements and entry competences required for the course				
2.3. Learning outcomes at the level of the programme to which the course contributes	Completes the knowledge about the morphological and functional characteristics of the cells and allows students to conclude about function based on cells feature.			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully completing the course, students will be able to: <ul style="list-style-type: none"> - appoint methods in the process of the research, - describe structure of the cells, - identify the basic components of the cell on the electron micrographs, - interpret elementary cellular functions, - interconnect the structure with the function of the cells. 			
2.5. . Course content broken down in detail by weekly class schedule (syllabus)	Methodological unit/course content	L	S	E
	1. Methods of cell investigate (light and electronic microscopy, cell fractionation and centrifugation, and cell culture).	1		2
	2. Chemical organization of the cell (water, electrolytes, proteins, lipids and carbohydrates).	1		
	3. Organization and function of the cell organelles (the membranous structures of the cell, and membranous structure of the cell organelles (granular and agranular endoplasmic reticulum, Golgy apparatus, lysosomes, peroxisomes, secretory vesicles).	1	1	

	4. Transport through the cell membrane (diffusion, facilitated diffusion, active transport, endocytosis (pinocytosis and fagocytosis), exocytosis. Nuclear envelope, transport between the nucleus and the cytoplasm.		1	1	1	
	5. Cell membrane receptors (signal transduction mechanisms for plasma-membrane receptors, chemicals as intercellular messengers).		1	1	2	
	6. Energy and cellular metabolism (glycolysis, formation of ATP by oxidative phosphorylation, structural and functional characteristic of mitochondria).		1	2		
	7. Nucleus (The structure of the nucleus. The cell cycle).		1			
	8. Cytoskeleton and cell movement (microtubules, microfilaments, intermediate filaments, directions of cell movement).		1			
	9. Intercellular junctions and communication between cells (zonula occludens, zonula adherens, nexus, macula adherens, hemidesmosomes). Apical specializations of the cell surface. Lateral specializations of the cell surface. Basal specializations of the cell surface.		1		1	
	10. Organization levels of animal organism. Diversity of the cells (epithelial cells - cells that transport ions, cells that transport by pinocytosis, chemical-messenger-producing cells, protein-synthesizing cells, mucus-secreting cells, serous cells, myoepithelial cells, steroid-secreting cells.		1		2	
	11. Cell differentiation. Age and death.			2		
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Student obligations are defined by Regulations on the integrated undergraduate and graduate Study of Veterinary Medicine, University of Zagreb.					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training	
	Experimental work		Report		Activity during lectures	
	Essay		Seminar essay		(other)	
	Tests	0,64	Oral exam		(other)	
	Written exam	0,8	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Activities		Minimum number of points		Maximum number of points	
	Lectures attendance (10 hours)		3 (coefficient 0,6) 3 / 0,6 = 5		6 (coefficient = 0,6) 6 / 0,6 = 10	
	Seminars attendance (7 hours)		4 (coefficient = 0,857) 4 / 0,857 = 5		6 (coefficient = 0,857) 6 / 0,857 = 7	
	Exercise attendance (8 hours)		4 (coefficient = 0,75) 4 / 0,75 = 6		6 (coefficient = 0,75) 6 / 0,75 = 8	
	Activity during exercises (brief knowledge assessment)		5		10	

	Continous assessment	20	32
	Written exam	24	40
	Total	60	100
	Title	Number of copies in the library	Availability via other media
2.11. Required literature (available in the library and via other media)	<p>Cooper, G.M., R.E.Hausman: The Cell: A Molecular Approach. ASM Press, Washington, D.C., Sinauer Associates, Inc., Sunderland, Massachusetts. 2003.</p> <p>Sjaastad Ø. V., O. Sand, K. Hove (2010): Physiology of Domestic Animals. The 12nd ed. Scandinavian veterinary press, 2010.</p> <p>Cooper, G. M., R. E. Hausman: The cell : a molecular approach. The 5th ed. ASM Press, Washington, USA. 2009.</p>	<p>1 book in the Library of the Department of Physiology and Radiobiology</p> <p>1 book in the Library of the Department of Anatomy, Histology and Embryology</p>	
2.12. Optional literature (at the time of submission of study programme proposal)	<p>Alberts, B., D. Bray, J. Lewis, M. Raff, K. Roberts, J. D. Watson: Molecular biology of the cell. The 2nd ed. Garland Publishing, Inc. New York, London. 1989.</p> <p>Seeley, R. R., T.D. Stephens, P. Tate: Essentials of Anatomy and Physiology. The 3rd ed. McGraw-Hill. Boston. 1999.</p> <p>Euel, J. A., B. L. Frappier: Dellmann's Textbook of Veterinary Histology. Blackwell Publishing. 2006.</p> <p>Mescher, A.: Junqueira's Basic Histology: Text and Atlas. The McGraw-Hill Companies, Inc. 2013.</p>		
2.13. Quality assurance methods that ensure the acquisition of exit competences	During the classes we will discuss with students and follow their progress. Acquired knowledge will be tested with final exam.		
2.14. Other (as the proposer wishes to add)			

THE ROLE OF VETERINARIANS AT ORGANIC FARMS

1. GENERAL INFORMATION			
1.1. Course teacher	Ana Shek Vugrovečki, PhD, assistant professor	1.6. Year of the study programme	III.
1.2. Name of the course	The Role of Veterinarians at Organic Farms	1.7. Credits (ECTS)	2
1.3. Associate teachers	Ana Shek Vugrovečki, PhD, DVM, assistant professor, Branimira Špoljarić, PhD, DVM assistant professor, Mario Ostović, PhD, associate professor, Zrinka Štritof, PhD, associate professor, Albert Marinculić, PhD, Full professor, Denis Cvitković, PhD, assistant professor	1.8. Type of instruction (number of hours L + S + E + e-learning)	12+18+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate study of veterinary medicine	1.9. Expected enrolment in the course	
1.5. Status of the course	selective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Course objectives are to teach students: 1) The difference between conventional and organic livestock production, 2) raising animals according to the principles of organic farms; 3) permanently monitor the health of animals and controlling owners whether he gives animals unauthorized preventive or therapeutic agents; 4) how to prevent and treat infectious and parasitic diseases; 4) how to treat animals with holistic medicine methods; 5) organization and management on the organic farm		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully mastering the course students will be able to: 1) describe the basic principles of organic livestock production 2) explain the difference between conventional and organic agricultural production 3) recognize the importance of continuous animal health monitoring at organic farm 4) to use the latest findings in keeping and feeding of animals according organic principles; 5) assess whether the sick animals are for treatment and in what manner, or are they for voidance, and 6) to conclude the way they should manage the organization and operation of the organic farm.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures: 1) The history of organic farming, development of organic production in world, Europe and Croatia; legislation - 2 hours 2) The indigenous breed as a base for organic farming - 2 hours, 3) The role of veterinarian on organic farm – challenges		

	<p>- 2 hours; 3) A holistic approach to healing animals - 2 hours, 4) The principles of invasive disease prevention - 2 hours, 5) Principles of infective disease prevention - 2 hours</p> <p>Seminars: 1) herd health monitoring - 4 hours, 2) Organization and Management at an organic farm - 4 hours, 3) Relationships between organism and environment - 4 hours 4) farm animals holistic treatment - 3 hours, 5) Principles of prevention and treatment of invasive diseases- 3 hours;</p>					
2.6. Format of instruction:	<p>x lectures</p> <p>x seminars and workshops</p> <p><input type="checkbox"/> exercises</p> <p><input type="checkbox"/> on line in entirety</p> <p><input type="checkbox"/> partial e-learning</p> <p><input type="checkbox"/> field work</p>	<p><input type="checkbox"/> independent assignments</p> <p><input type="checkbox"/> multimedia and the internet</p> <p><input type="checkbox"/> laboratory</p> <p><input type="checkbox"/> work with mentor</p> <p><input type="checkbox"/> (other)</p>	2.7. Comments:			
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,3	Research		Practical training	
	Experimental work		Report		Seminar essey	0,6
	Essay		Seminar essay	0,2	(other)	
	Tests	0,2	Oral exam	0,7	(other)	
	Written exam		Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Type of activity	minimal score		maximal score		
	Class attendance	10		18		
	12 hours lectures + 18 hours seminars	(coefficient = 0,6) 16 x 0,6 = 10		(18:15 = 1,2 coefficient) 15 x 1,2 = 18		
	On-course activity	5		10		
	1 positive answer = 5 bodova	(5:1=5; coefficient = 1) 1 of 2 positive answer		(10:1=10; coefficient = 1) 2 of 2 positive answers		
		20		32		
	Final exam	25		40		
	Oral exam 1 positive answer = 8 points	3 positive answers		5 positive answers		
Total	60		100			
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Vaarst M. et al. (2004): Animal health and welfare in organic agriculture. Bristol. CABI publishing			1		
	Lampkin N. (2002): Organic farming. Ipswich. Old Pond publishing			1		
	Newtoin J. (2004): Profitable Organic Farming, 2ed. Bleckwell Science			1		
2.12. Optional literature (at the time of submission of study programme proposal)	<p>1) Annual report for 2007, IFOAM, 2008., www.ifoam.org; 2) Duchateau, K. (2003.): Organic farming in Europe. A sustained growth over the period 1998-2000. Statistics in focus. Environment and energy. Theme 8 – 2. 1-8. http://www.eisfom.org/links/EUROSTAT.PDF; 3) Lindquist, A. Animal health and welfare in organic sheep and goat farming, Swedish Animal Health Service; 4)</p>					

	Organic Farming in Europe: http://www.organic-europe.net/default.asp ; 5) http://www.ekoconnect.org/ ; 6) http://www.organicvet.co.uk/
2.13. Quality assurance methods that ensure the acquisition of exit competences	
2.14. Other (as the proposer wishes to add)	

VETERINARY CLINICAL MICROBIOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof Ljiljana Pinter, PhD, DVM	1.6. Year of the study programme	3 (VI semester)
1.2. Name of the course	Veterinary Clinical Microbiology	1.7. Credits (ECTS)	2.0
1.3. Associate teachers	Prof Nevenka Rudan, PhD, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	30 (L-8, E-22)
1.4. Study programme (undergraduate, graduate, integrated)	Integrated undergraduate and graduate veterinary study programme	1.9. Expected enrolment in the course	Max number of students: 10
1.5. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	Lessons and practical work in Veterinary Clinical Microbiology should upgrade student microbiology knowledge, medical thinking, and should improve their capability in differential diagnostic procedures. Lessons and practices in Veterinary Clinical Microbiology are organised in order to gain practical experiences within the area of clinical microbiology.		
2.2. Course enrolment requirements and entry competences required for the course	Basic requirements are Veterinary Immunology, General Microbiology and Special Microbiology with minimum score \sum 3.5 Max number of students: 10		
2.3. Learning outcomes at the level of the programme to which the course contributes	Lessons and practical work will capacitate student for further understanding of clinical subjects of the veterinary medicine studies particularly in the area of infectious diseases.		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to demonstrate, after attended lessons and practices in Veterinary Clinical Microbiology, knowledge on morphology and physiology and identification of the most important causative agents of animal diseases. Student will have additional knowledge on microbes pathogenicity and their relation to antimicrobial substances. After the course students will be able to perform simple procedures of microbes identification, including use of commercial compounds suitable for veterinarians in practice, and will be able to perform immunoprophylaxis of infectious diseases.		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>INTRODUCTORY LECTURE – Introduction to clinical microbiology area of bacteriology, mycology and virology. L -1</p> <p>SAMPLING METHODS IN MICROBIOLOGY – Sampling procedures and transport of pathogen material to microbiology laboratories, safe measures and documents. L – 2, E – 4</p> <p>IDENTIFICATION OF MICROBES FROM CLINICAL SPECIMENS – Identification procedures of bacteria, fungi and viruses, rapid tests. L – 2, E – 6</p> <p>TESTING FOR THE DRUG SUSCEPTIBILITY OF MICROBES – Techniques (agar diffusion methods, dillution methods), minimum inhibitory concentrations. E – 2</p> <p>INTERPERTATION OF THE LABORATORY RESULTS AND DIFFERENCIAL DIAGNOSIS – critical point for medical interpretation L -1, E – 5</p>		

	CHOICE THERAPY – methods of choosing the wright antimicrobial therapeutics in different animal species. L – 2, E - 5					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay		activities	0.2
	Tests	0.64	Oral exam		(other)	
	Written exam	0.80	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	1. Attended lectures and exercises (1 hour = 1 point) - max 30, min 20 points 2. Microscopic slides questionarie (1 slide = 2 points) - max 10, min 6 points 3. Final exam (1 question = 2 points) - max 20, min 12 points All: max 60, min 38 points					
	Points:		Mark:			
	0 – 37		1			
	38 – 40		2			
	41 – 49		3			
	50 – 56		4			
	57 – 60		5			
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Quinn, P. J., M. E. Carter, B. K. Markey, G. R. Carter (1994): Clinical Veterinary Microbiology. M. Wolfe. London.					
	Songer, J. Glenn, K. W. Post (2005): Veterinary Microbiology. Bacterial and Fungal Agents of Animal Disease. Elsevier Saunders.					
2.12. Optional literature (at the time of submission of study programme proposal)	Naglič, T., D. Hajsig, J. Madić, L. Pinter (2005): Specijalna veterinarska bakteriologija i mikologija. Veterinarski fakultet Sveučilišta u Zagrebu i Hrvatsko mikrobiološko društvo, Zagreb. Hajsig, D., Lj. Pinter, T. Naglič, R. Antolović (2012): Veterinarska klinička imunologija. Sveučilišni udžbenik, Veterinarski fakultet Sveučilišta u Zagrebu i Hrvatsko mikrobiološko društvo, Zagreb. Hajsig, D., F. Delaš (2016): Priručnik za vježbe iz opće mikrobiologije. Hrvatsko mikrobiološko društvo, Zagreb.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Test results, final discussions and anonymous questionnaires in order to get student critical opinion and suggestions for improvement.					
2.14. Other (as the proposer wishes to add)						

VETERINARY CLINICAL PATHOLOGY

1. GENERAL INFORMATION			
1.1. Course teacher	Prof. Vladimir Mrljak, PhD.	1.6. Year of the study programme	5th
1.2. Name of the course	Veterinary Clinical Pathology	1.7. Credits (ECTS)	2
1.3. Associate teachers	Professor Renata Barić Rafaj, PhD., Associate professor Romana Turk, PhD., Assistant professor Ivan - Conrado Šoštarić – Zuckermann PhD.,	1.8. Type of instruction (number of hours L + S + E + e-learning)	14 8 + 8
1.9. Study programme (undergraduate, graduate, integrated)	integrated	1.9. Expected enrolment in the course	
1.10. Status of the course	elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	<p>In the course Veterinary laboratory diagnostics students should learn: principles of laboratory diagnostic tests in clinical medicine (to distinguish physiological from pathological conditions, for the diagnosis, monitoring of treatment, prognosis and outcome of the disease); assessment of laboratory findings with respect to the reference value, preanalytical, analytical and postanalytical factors, standards and quality indicators and the rules of good professional practice of medical diagnostic laboratories; choice of rational guidelines and algorithms for diagnosis and monitoring of the treatment of emergencies in veterinary medicine (poisoning, trauma, inflammation and sepsis); metabolic disorders of electrolyte and acid-base balance; kidney disease; liver disease; diseases of the gastrointestinal tract and pancreas; selection and interpretation of laboratory measurements in metabolic diseases; oncological diseases, anemia, coagulation disorders, diseases of the endocrine system; selection and interpretation of tests in the preoperative treatment , transfusion of blood and blood preparations. After completing the course Veterinary laboratory diagnostics students have to acquire the following skills: the ability to use laboratory diagnostics based on scientific evidence, the ability to access critical evaluation of laboratory data, ability to integrate acquired knowledge in multidisciplinary laboratory diagnostics for clinical practice, ability of risk assessment and the range of laboratory data, ability to perform analyses in emergency veterinary medicine, communication skills with specialist laboratory specialists, ability to use laboratory measurements in the planning of scientific research.</p>		
2.2. Course enrolment requirements and entry	Without conditions		

competences required for the course						
2.3. Learning outcomes at the level of the programme to which the course contributes	After completion of the course, the student has gained the ability to use laboratory diagnosis based on scientific evidence, critical approach to the assessment findings laboratory tests, the ability to integrate multidisciplinary knowledge gained from laboratory diagnostics for clinical practice, the ability of risk assessment and the range of individual search algorithms, ability to perform emergency laboratory tests in emergency veterinary medicine, the ability to apply laboratory tests in the planning of scientific research.					
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of the course, the expected outcomes at the level of the: - define the selection of laboratory tests required for diagnosis, treatment and insight into the health status of the patient - evaluate the analytical methods and their achievements in determining analytes in biological samples - apply the skills of conducting the tests with the patient - self-interpret the results of laboratory analysis, and acquire the skills of critical evaluation different results of diagnostic tests - he ability to use the integration of multidisciplinary knowledge gained from laboratory diagnostics and clinical practice					
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1.Introduction in Clinical Laboratory Diagnostics; 2. Introduction to Hematology, 3. Erythrocytes and leukocytes, staining technique and differential blood count; 4. Identifying blood cells and analysis of clinical cases; 5. Application of functional tests in clinical diagnostics - selection in the assessment of renal, liver, and gastroenterology function - analysis of clinical cases; 6. Urinalysis - analysis of clinical cases; 7. Laboratory tests of coagulation and hemostasis - analysis of clinical cases; 8. Minerals, electrolytes and acid-base status - analysis of clinical cases; 9. Specific functional tests in the clinical diagnosis of diseases of the pancreas, thyroid and adrenal glands - analysis of clinical cases; 10. Clinical cytological diagnosis - analysis of clinical cases; 11. Laboratory immunodiagnostics and molecular diagnostics; 12. Clinical biochemistry in emergency veterinary medicine - analysis of clinical cases.					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7. Comments:			
2.8. Student responsibilities	Presence at lectures, seminars and exercises, practical activity in seminars and exercises, practical exercises performed successfully, successfully passed the final exam					
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total	Class attendance	0.36	Research		Practical training	
	Experimental work		Report		knowledge verification - seminars	
	Essay		Seminar essay		knowledge verification - exercises	
	Tests	0.64	Oral		Activity	0.2

<i>number of ECTS credits is equal to the ECTS value of the course)</i>	Written exam	0.80	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Will be additionally incorporated in concordance with the decree of the Council of the Faculty of Veterinary Medicine from 2008.					
2.11. Required literature (available in the library and via other media)	Title				Number of copies in the library	Availability via other media
	BSAVA Manual of Canine and Feline Clinical Pathology (Elizabeth Villiers and Jelena Ristić), British Small Animal Veterinary Association, third edition, 2018.				0	
	Veterinary Hematology and Clinical Chemistry (Thrall, M.A., Weiser, G., Allison, R. , Campbell, T.W.), Lippincott Williams& Wilkins, second ed., 2012				0	
	Veterinary Clinical Pathology. A Case-Based Approach, Kathleen P. Freeman, Stefanie Klenner, CRC Press, 2015.				0	
	http://eclinpath.com/					web
2.12. Optional literature (at the time of submission of study programme proposal)						
2.13. Quality assurance methods that ensure the acquisition of exit competences						
2.14. Other (as the proposer wishes to add)						

VETERINARY NUCLEAR MEDICINE

1. GENERAL INFORMATION			
1.1. Course teacher	Marinko Vilić, DVM, PhD, Associate Professor	1.6. Year of the study programme	4
1.2. Name of the course	Veterinary nuclear medicine	1.7. Credits (ECTS)	1
1.3. Associate teachers	Ivona Žura Žaja, DVM, PhD, Assistant Professor Ana Shek Vugrovečki, DVM, PhD, Assistant Professor Jadranka Pejaković Hlede, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	L12+S0+E3
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	-
2. COUSE DESCRIPTION			
2.1. Course objectives	At the Veterinary nuclear medicine course students will learn how to be able to evaluate in which cases the patient should carry out to veterinary nuclear medicine, to select and prepare adequate radiopharmaceutical, to carry out scintigraphy and diagnose.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes			
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After successfully mastering the course students will be able to: -define basic terms of veterinary nuclear medicine - to evaluate in which cases the patient should carry out scintigraphy - to select an adequate radiopharmaceutical - perform radiation protection of their selves, their associates and animals		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	1. Development of nuclear medicine 2. Radio-pharmaceuticals (definition; ideal radio-pharmaceutical; radio-nuclide generator; application) 3. Instrumentation (scintillation counter; rectilinear scanner; gamma camera) 4. Radiation protection 5. Nuclear medicine in small animal practice 6. Nuclear medicine in equine practice 7. Radiotherapy.		

2.6. Format of instruction:	X lectures	<input type="checkbox"/> independent assignments	2.7. Comments:			
	X seminars	<input type="checkbox"/> multimedia and the internet				
	X exercises	<input type="checkbox"/> laboratory				
	<input type="checkbox"/> on line in entirety	<input type="checkbox"/> work with mentor				
	<input type="checkbox"/> partial e-learning	<input type="checkbox"/> (other)				
	<input type="checkbox"/> field work					
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.18	Research		Practical training	
	Experimental work		Report		Activity (other)	0.1
	Essay		Seminar essay		(other)	
	Tests	0.32	Oral exam		(other)	
	Written exam	0.4	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	1. attending lectures 2. attending exercises 3. final exam					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Daniel, G.B., C.R. Berry (eds.) (2006): Textbook of Veterinary Nuclear Medicine. American College of Veterinary Radiology					
2.12. Optional literature (at the time of submission of study programme proposal)	Vilić, M. (2018): Veterinary nuclear medicine. Internal scripts. Faculty of Veterinary Medicine, Zagreb.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Final exam					
2.14. Other (as the proposer wishes to add)						

VETERINARY ETHICS

1. GENERAL INFORMATION			
1.1. Course teacher	Assoc. Prof Dean Konjević Dipl. ECZM	1.6. Year of the study programme	1
1.2. Name of the course	Veterinary Ethics	1.7. Credits (ECTS)	2
1.3. Associate teachers	Prof Krešimir Severin, Assoc. Prof Gordana Gregurić Gračner	1.8. Type of instruction (number of hours L + S + E + e-learning)	15+15+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective course	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	
2. COUSE DESCRIPTION			
2.1. Course objectives	The subject aims to introduce students with development, basic principles and application of ethics in veterinary medicine. Students will become familiar with legislation that covers areas of veterinary ethics and code of ethics on both national and international level. The goal of this subject is to teach students ethical principles in all aspects of veterinary medicine, especially in the scientific research.		
2.2. Course enrolment requirements and entry competences required for the course	None		
2.3. Learning outcomes at the level of the programme to which the course contributes	1. to learn fundamentals of veterinary ethics that will be upgraded during the programme 2. to enhance development of critical opinion in the field of veterinary medicine 3. to improve human-animal-animal owner relations		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. to acquire knowledge on development of veterinary ethics and its differences between different countries. 2. to learn and understand different aspects of observing human-animal relations 3. to understand guidelines of veterinary professional ethics 4. to apply ethical principles in all fields of veterinary medicine		
2.5. Course content broken down in detail by weekly class schedule (syllabus)	Lectures – topics (15) 1. Fundamentals of veterinary ethics 2. Development of veterinary ethics with emphasis on the Republic of Croatia 3. Sources of veterinary ethics 4. Aspects of human-animal relations 5. Legislation 6. Code of ethics 7. Modern veterinary ethics and burnout syndrome 8. Veterinary ethics in animal breeding 9. Veterinary ethics in food production 10. Veterinary ethics in scientific research 11. Veterinary ethics and communication skills Seminars - topics (15) 1. Animal welfare, animal rights		

	2. History of veterinary ethics in Croatia and neighbouring countries 3. Relevant (ethics) international legislation, description of ethical guidelines 4. Ethical principles related to clinical work 5. Ethical principles and wild animals 6. Preparation of scientific research 7. Evaluation of ethical principles and guidelines in accordance to veterinary education 8. Veterinary ethics in different countries					
2.6. Format of instruction:	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> work with mentor <input type="checkbox"/> (other)		2.7. Comments:	
2.8. Student responsibilities						
2.9. Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0.36	Research		Practical training, activity	0.20
	Experimental work		Report		(other)	
	Essay		Seminar essay		(other)	
	Tests	0.64	Oral exam		(other)	
	Written exam	0.80	Project		(other)	
2.10. Grading and evaluating student work in class and at the final exam	Class attendance 30% (attendance at lectures – 15%, seminars – 15%) Activity on seminars 30% (seminar preparation, presentation and discussion) Written exam 40%					
2.11. Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	1. Rollin, B. E. (2006): An Introduction to Veterinary Medical Ethics: Theory and Cases. 2 nd edn., Blackwell Publishing, USA			Department Library - 1	0	
	Sandøe, P., S. B. Christiansen (2013): Ethics of Animal Use. Blackwell Publishing, USA.			Department Library - 1	0	
2.12. Optional literature (at the time of submission of study programme proposal)	1. Staffle, F. R. (1994): The Ethical acceptability of animal experiments as judged by researchers. Utrecht, NL.					
2.13. Quality assurance methods that ensure the acquisition of exit competences	Written exam.					
2.14. Other (as the proposer wishes to add)						

WILDLIFE DISEASES

1. GENERAL INFORMATION			
1.1. Course teacher	Assist. Prof. Magda Sindičić, PhD, DVM	1.6. Year of the study programme	6
1.2. Name of the course	Wildlife Diseases	1.7. Credits (ECTS)	2
1.3. Associate teachers	Full professor Zdravko Janicki, Full professor Alen Slavica, Assistant professor Dean Konjević, PhD, DVM	1.8. Type of instruction (number of hours L + S + E + e-learning)	4+0+26+0
1.4. Study programme (undergraduate, graduate, integrated)	Integrated	1.9. Expected enrolment in the course	
1.5. Status of the course	Elective	1.10. Level of application of e-learning (level 1, 2, 3), percentage of online instruction (max. 20%)	Level 1
2. COUSE DESCRIPTION			
2.1. Course objectives	The goal of this subject is to teach basic principles of wildlife diseases, including surveillance, diagnostic procedures, pathogenesis, clinical presentation, epidemiology, pathology, prevention and potential treatment. Emphasis will be given on critical awareness of current problems in wildlife diseases through case based examples, as well as examples previously reported in scientific literature. During the lectures we will outline interaction between different types of pathogens and hosts, the potential impact of diseases on the population level, especially on endangered populations, and impact of human activities on the spread of wildlife disease. This subject is complementary to previous subjects on domestic animal infectious diseases, so knowledge gained during these courses is prerequisite for understanding this course.		
2.2. Course enrolment requirements and entry competences required for the course			
2.3. Learning outcomes at the level of the programme to which the course contributes	<ul style="list-style-type: none"> - broad overview of wildlife diseases, their impact on human and livestock health - protection of wildlife, livestock and human health - understanding of the effects of human activities, urbanization, and climate change on the health of wildlife populations 		
2.4. Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<ul style="list-style-type: none"> - Surveillance of wildlife diseases - Prevention of wildlife diseases - Diagnostic methodologies - Therapeutic measures used in wildlife - Assessment of the impact of diseases on game management and endangered species 		

2.5.Course content broken down in detail by weekly class schedule (syllabus)	<p>In modern environment diseases of wild mammals are increasingly important field of veterinary medicine. Lack of wildlife disease surveillance is recognized as one of the factors that contribute to the spreading of emerging infectious disease and zoonosis.</p> <p>Course content:</p> <ol style="list-style-type: none"> 1. Introduction – particularities of wildlife disease monitoring, diagnostics, prevention and treatment 2. National wildlife disease surveillance systems and the role of veterinarians 3. Post-mortem procedures, including working in field conditions, prevention measures and sample collection 4. Non-infectious diseases – natural hazards, poisoning, trauma, myopathy 5. Viral diseases of wild ungulates 6. Bacterial diseases of wild ungulates 7. Parasites of wild ungulates 8. Diseases of suide 9. Diseases of hares and rabbits 10. Diseses of carnivores 11. Overview of most important diseases in birds 12. Importance of diseases monitoring in game management and conservation of endangered species 13. Diseases of complex aetiology (Chronic Wasting Disease,, Epizootic diarrhoea syndrome in roe deer 						
2.6.Format of instruction:	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> on line in entirety <input type="checkbox"/> partial e-learning <input checked="" type="checkbox"/> field work	<input checked="" type="checkbox"/> independent assignments <input checked="" type="checkbox"/> multimedia and the internet <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)	2.7.Comments:				
2.8.Student responsibilities	Attending lectures (50%), exercise (70%), active participation in exercises and in practical task/problem solving.						
2.9.Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Class attendance	0,36	Research		Practical training		
	Experimental work		Report		Activity	0,2	
	Essay		Seminar essay		(other)		
	Tests	0,64	Oral	0,8	(other)		
	Written exam	0,1x2,5=0,25	Project		(other)		
2.10. Grading and evaluating student work in class and at the final exam	<p>Elements of assessment:</p> <ol style="list-style-type: none"> 1 Presence at lectures 2. Presence at exercises 3 engagement and the result of practical work 4. written exam 5. oral exam 						
2.11. Required literature (available in the	Title			Number of copies in the library	Availability via other media		

library and via other media)	1. Woebser, G. (2007): Diseases in wild animals, second edition. Springer.		
	2. Hudson, P. J., A. Rizzoli, B. T. Grenfell, H. Heesterbeek, A. P. Dobson (Eds.) (2002): The Ecology of Wildlife Diseases. Oxford University Press Inc., New York, USA.		
	3. Samuel, W. M., M. J. Pybus, A. A. Kocan (Eds) (2001): Parasitic Diseases of Wild Mammals 2nd edn. Manson Publishing / The Veterinary Press, London, UK.		
	4. Williams, E. S., I. K. Barker (Eds) (2001): Infectious Diseases of Wild Mammals 3rd edn. Manson Publishing / The Veterinary Press, London, UK.		
	5. Fowler, M. E., R. E. Miller (1999): ZOO & Wild Animal Medicine, Current Therapy 4. W. B. Saunders Company, Philadelphia, USA.		
2.12.Optional literature (at the time of submission of study programme proposal)	<p>1. Stephen C (2014) Toward a modernized definition of wildlife health. Journal of Wildlife Diseases, 50(3):427-430.</p> <p>2. Gibbs, E. P. J., B. H. Bokma (Eds) (2002): The Domestic Animal/Wildlife Interface. Issues for disease control, conservation, sustainable foodproduction, and emerging diseases. The New York Academy of Sciences, New York, USA.</p> <p>3. Stocker, L. (2000): Practical Wildlife Care. Blackwell Publishing, Oxford, UK.</p> <p>4. Woodford, M. H., D. F. Keet, R. G. Bengis (2000): Post-mortem procedures for wildlife veterinarians and field biologists. OIE, Pariz, Francuska</p> <p>5. Woodford, M. H. (Ed) (2001): Quarantine and health screening protocols for wildlife prior to translocation and release in to the wild. OIE, Pariz, France</p>		
2.13.Quality assurance methods that ensure the acquisition of exit competences	<p>1. Presence at lectures and exercises (students must attend at least 50% of lectures and 70% of exercises).</p> <p>2. Active participation during classes</p> <p>3. Final exam (written and oral)</p>		
2.14.Other (as the proposer wishes to add)			

USEFUL INFORMATION FOR STUDENTS

About Zagreb

City of Zagreb is the capital and largest city in the Republic of Croatia. It is a cultural, scientific, economic, political and administrative centre of the Republic of Croatia with seat Parliament, President and Government of the Republic of Croatia.

Area: 641.355 km²

Population: 800.000 (data from 2011)

History in brief: Written documents first mention Zagreb in 904, with founding of the Diocese.

In 1242, Zagreb (then Gradec) was proclaimed Free Town of the Kingdom by the Golden Bull of the Croatian-Hungarian King Bela IV. In 1577, Zagreb was for the first time mentioned in written documents as the capital.

In 1669, Jesuits found the first gymnasium and Academy. The year is taken as the year of establishment of the University of Zagreb.

In 1776, seat of Croatian King's council (Government) moves from Varaždin to Zagreb. On June 25, 1991, Croatian parliament proclaims independence and sovereignty of the Republic of Croatia. Zagreb becomes the capital.

Museums and exhibitions

Archaeological Museum, Meštrović Atelier, Croatian House of Visual Artists, Ethnographic Museum, Gliptoteka HAZU – Sculpture Museum of the Croatian Academy of Science and Arts, Hunting Museum, HT Museum (telecommunications and postal traffic), Croatian History Museum, Croatian Sports Museum, Croatian School Museum, HAZU (Croatian Academy of Sciences and Arts) Department of Prints and Drawings, Modern Gallery, Zagreb City Museum, The Mimara Museum, Museum of Arts and Crafts, Museum of Contemporary Art, Klovicevi Dvori Museum Gallery Centre, Strossmayer Gallery of Old Masters, Technical Museum, Museum of Broken Relationships, Art Pavilion.

Events

Eurokaz (The International Festival of New Theatre), Zagreb Philharmonic Orchestra Festival, The world festival of animated movies, Floraart (International flower and garden show), International folklore festival, Music biennale Zagreb, Week of modern dance, Zagreb Histrion Summer and other theatre performances and concert hall events.

Sport and leisure centres

Hippodrome, Jarun Lake, Bundek Lake, Maksimir Park, Medvednica (Sljeme) Nature Park, Mladost Sports Park, Šalata Sport Centre; Ice Rinks: Dom sportova, Šalata and Velesajam; swimming pools: Mladost, Utrine, Dom sportova; Ski resort Sljeme (10 km from downtown)

Source: City of Zagreb (www.zagreb.hr)

Source: University website (www.unizg.hr)

PAPERWORK

Keeping up-to-date with the paperwork requirements in a new country is never easy but it's worth the peace of mind. As foreigners arriving to a new country, it is our responsibilities to be aware of laws and regulations pertaining to our stays. However, any current student understands that this is not easy and we'd like to do our best to help this process along for you. Here is our interpretation of the rules, processes and expectations along with what we hope are some useful websites.

If you are non-EU citizen don't forget to have your passport presented (in case of visa, you should get the stamp) at the border when you arrive! Avoid the hassle by asking the border guard to kindly stamp your passport!

EU citizens need to present a national ID.

The official source of the latest information regarding the documents required of foreign residents during their stay is always Ministarstvo unutarnjih poslova, the Croatian police („MUP“) whose main station is located at Petrinjska 30. Their telephone number is +385 1 45 63 623. You can find lots of helpful and the most up-to-date information on their website (www.mup.hr). (This is another website where the translate feature of Google can be very helpful!)

OIB

www.oib.hr

Shortly after arriving in Zagreb, you should get your national identity number “osobni identifikacijski broj – OIB”). You'll need this for many purposes including registering for classes in September. You can apply in-person at Tax Administration office, Avenija Dubrovnik 32, 10 000 Zagreb.

TEMPORARY RESIDENCE PERMIT

Be sure to check for info the latest on paperwork requirements and useful downloads on the portion of the MUP website pertaining to foreigners. The English version site is available at www.mup.hr/120009.aspx. Everything is quite well explained on the site but here's a summary of what you'll find. All foreign students staying in Croatia must obtain a „Temporary residence permit“. The permission is valid for one year after which time, a renewal application is submitted. All applications can be submitted at MUP in Zagreb. All documentation must be in Croatian, using official translations when needed and none can be more than six months old.

The students, who need a visa for entry in Croatia, should submit the request to a respective Croatian diplomatic mission, while the students who do not need a visa, may submit their requests in the police station in Zagreb.

For additional information, a contact-person from Zagreb's Police Department is available at tel. +385 1 45 63 623.

While waiting for your permission to stay, you will be able to stay in Croatia legally on the visa. Be sure to check the Croatian visa requirements for your country. One month before the Permission expires, you'll need to be in Zagreb in order to resubmit similar documents and paperwork as in your initial application.

Something not mentioned on the pages of the MUP website but can be found in the „Aliens Act“ which is available on the site for download, is that once you are the bearer of a Temporary residence permit, you will not be allowed to leave Croatia for more than 30 days at a time in order for your Permit to remain valid.

Another important piece of info that's not explicitly stated is that while you have a Temporary residence Permit, you will be required to participate in the Croatian National Health Plan.

Don't be surprised during your renewal application process when you're asked for a biljeg. This is a stamp that shows you've paid a small fee to the state for handling some paperwork. You can buy them at most Tisak news agents' stands. You'll need one at the tax office for your proof of having paid your health insurance and you'll also need one when submitting your application for renewal at MUP. It's a little tricky to know how to handle these as you may encounter that a price has changed from year to year and you'll only really know how much you owe once someone asks you for one. To be safe, check the MUP website for their current price of paperwork handling (they refer to it in English as a „revenue stamp“) and arrive at MUP with a biljeg paper clipped to your application. In all other cases, wait until you're asked for one before dashing to the nearest Tisak.

PUBLIC TRANSPORTATION

The great thing about the city is how you can really get everywhere on foot! That being true, if you're not living in the immediate downtown or need to get out to the Jarun Lake or Maksimir Parks or just want to check out the tram system you might want to acquire a student tram pass. These passes are issued at any of the 13 Zagreb municipal transit system, Zagrebački električni tramvaj (ZET) and offices. The best bargain is with monthly or yearly pass. However if you are not ready for such a commitment you can get single or 24-hour tickets at a newsagent. In any case make sure you are covered because ZET controllers issue unpleasantly steep fines to riders without valid tickets.

There are three ways of public transportation in the City of Zagreb – trams, buses and city railway. Zagreb Electric Tram (ZET, www.zet.hr) together with Croatian railway (www.hz-net.hr) conduct the public transport in Zagreb.

How to get a monthly or annual ticket (“pokaz”) for Zagreb local transportation?- take a form for a monthly or annual ticket at one of the ZET main tram stations, such as at Borongaj final stop, at Remiza, Dubrava or in Marić passage which is close to Jelačić square, entrance from Gajeva or Praška - confirm the form containing a photo 3x3,5 cm in Students office at the Faculty - submit the confirmed form, “iksica” card and Students grade book “indeks” into one of the listed ZET offices to get your ticket printed. Issuing costs 30 kuna.

Student annual tickets are issued in October in the following ZET offices:

	from Monday to Friday	Saturday
ZET, Ozaljska 105, entrance East	7.30 am – 6 pm	8 am - 4 pm
BORONGAJ, tram terminal	10 am – 6 pm	8 am -4 pm
ZAPRUĐE, Ulica Zlatka Balokovića bb	10 am – 6 pm	8 am -4 pm
DUBRAVA, ZET terminals	10 am – 6 pm	8 am -4 pm
SAVSKI MOST, Savska cesta bb, tram terminal	10 am – 6 pm	8 am - 4 pm
TRG MAŽURANIĆA, Trg Mažuranića	10 am – 6 pm	8 am - 4 pm
ČRNOMEREC, tram terminal	10 am – 6 pm	8 am - 4 pm

At other times, student annual tickets are issued in:

- Marić passage, Mon to Sat, 6.30 am-8 pm
- Ozaljska 105, Mon to Fri, 7.30 am-6 pm

To get more information call ZET, phone: +385 1 36 51 478 or 36 51 479

Visit ZET website for useful information: <http://www.zet.hr/>

STUDENT RESTAURANTS so called “kantinas” or “mensas” (the student dining halls)

Meals, cafe, refreshments and cakes at affordable prices are served in student restaurants and cafeterias run by the Student Centre University of Zagreb. Services and offerings may vary in over 20 restaurants at various locations in the city, one of which is found at Faculty of Veterinary Medicine. The biggest student restaurant is located in the Student Centre, Savska 25.

At the time of publication, the kantina discount prices are available to students who have a Croatian or EU nationality, as being subsidized by Croatian ministry of science. These discount dining facilities will hopefully become available to all students of the faculty in the near future. Until then, you will have to pay a full price for meals at student restaurants; a complete meal will cost you approx. 20 HRK.

Internet at the Faculty of Veterinary Medicine

The Faculty of Veterinary Medicine is connected to the Internet by Croatian Academic and Research Network (CARNet). Computers can be used in the Library Reading Room and at student premises (Equus student club). Password is not needed for the access. Apart from those personal computers, there are computer classrooms which are mostly used for teaching. Undergraduate and graduate students are entitled to use public computers at the Faculty, to obtain their AAI@Edu.hr (EduRoam) identity (which is used as “electronic identity”), e-mail address as well as personal web page at the Faculty server. AAI@Edu.hr (EduRoam) electronic identity enables access at reduced price to a number of services, such as:

- scientific and research papers databases access (<http://bib.irb.hr>)
- CARNet public modem Internet access
- Mobile CARNet services (wireless Internet access powered by Vipnet service provider)
- XCARNET service (wireless access by B.net cable television network)
- MetroCARNet service (Metronet service provider)

Read more on the above listed services at <http://www.carnet.hr> and <http://www.vef.hr/ict>. A number of accessible services with e-identity has been constantly increasing.

Users account for listed services, AAI@Edu.hr identity and personal e-mail address can be obtained at IT Department (within the Library) by producing a student grade book (“Indeks”) or student ID card (“X-card”, “iksica”).

EXAMS & OTHER ESSENTIALS

X-card

This is your official student ID card. For students with a Croatian and EU citizenship, this card also serves to provide discounts at students’ restaurants and coffee shops (“kantinas”). During your first days in Zagreb you will have your photo taken (and it's the same photo you will have during the whole of your stay, so smile pretty!) and the card will be available approximately a week later.

LMS

This is the official communication site for all courses during all years of study. You'll be given a username and password during your first weeks here, so as soon as you can, log-on and get familiar with all its features. The administration regularly posts important announcements here and documents such as course outlines and schedules are

available for download. Some professors also provide course materials and use other interactive features of the site.

EMAIL

This is the official school email account: SquirrelMail. This account requires the same username and password as LMS. Some professors require you to use this address when contacting them and any new info posted to LMS routes an announcement here. If you already have an email address that you use and love, you may find it most convenient to re-route your SquirrelMail into your existing account.

Studomat

www.isvu.hr/studomat

Studomat is the website where all your information as a student is held and updated. The student ID number located on your indeks and x-card is the 'user name' you will use to log-in to this site.

All exam dates are posted on studomat. Students **MUST** „sign-up“ here for their exams, usually 7 days in advance. Cancellations are also made via studomat and are usually allowed up until 3 days prior to the exam.

GRADE BOOK (“Indeks”)

This thin, dark blue book is the permanent record of the classes in which you've been registered and the marks you've received at their completion. It is as essential as your passport: take good care of it! You'll need it in order to register for classes, to take your exams, to apply for your permission to stay, and any other time you need proof that you're a full time student (such as receiving the student rate for your tram pass).

Usually during the last few days of a course, students are required to present their indeks to the course co-ordinator for his or her signature. Obtaining this signature allows you to apply for the final exam. Eligibility for these signatures typically depends on class attendance and activities. When you pass an exam, the examiner fills in your grade and signs your indeks one more time. So remember to bring your indeks to both written and oral exams!

OTHER (HOPEFULLY) USEFUL INFORMATION

IMPORTANT TELEPHONE NUMBERS

In case of an emergency, Croatia has implemented Europe's wide **EMERGENCY NUMBER 112** which then transfers you to police, emergency or the fire department.

- 192 - Police
- 194 - Ambulance emergency
- 193 - Fire department
- 1987 - Road help
- 195 - Search and rescue on the sea
- 18166 - Weather forecast
- 18981 - general info
- 11888 - info about local and national telephone numbers
- 11802 - info about international telephone numbers

Crime figures rank Zagreb and Croatia significantly lower than most of Europe. Anyhow, you should keep your eyes on your belongings at all time.

POST OFFICES

Jurišićeva 13; 4811-090 (Mon-Fri: 07 am – 20 pm; Sat: 07 am – 13 pm)

Branimirova 4; 4981-300 (Mon-Sun: NON-STOP)

RENTAL ACCOMMODATIONS

It is always a good idea to search for information on social network pages and student groups where you can find rent offers and other students looking for a place to stay and roommate (njuskalo.hr, gohome.hr, very known is Facebook group: Erasmus Zagreb 2014/2015 Official Group, rentinzagreb.com, homeinzagreb.com, sublet.com, realitica.com). You can enter search terms like „najam stana u Zagrebu od 350 eura“).

The approximate average prices You may expect:

- single room: 150-200EUR + charges

- flat: 350-600EUR + charges

PHARMACIES 0-24

Central Pharmacy, Jelačić square 3

Dubrava, Grižanska 4

Ilica, Ilica 301

Ozaljska, Ozaljska 1

Siget, Avenija Većeslava Holjevca 22

NATIONAL HOLIDAYS

National holidays are important to remember while living in Zagreb because, if for no other reason, you need to plan on most shops being closed and classes cancelled for that day. Be sure to ask your professors about changes to your schedule for courses that run during a holiday.

January 1: New Years Day

January 6: Epiphany

Easter and Easter Monday

Corpus Christi: 60 days after Easter

May 1: International Workers Day

June 22: Anti-Fascist Struggle Day

June 25: Statehood Day

August 5: Victory and Homeland Thanksgiving Day

August 15: Assumption of Mary

October 8: Independence Day

November 1: All Saints day

December 25-26: Christmas