



REPUBLIC OF MACEDONIA  
SS. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE  
FACULTY OF VETERINARY MEDICINE



# Study program of integrated studies in Veterinary Medicine

Skopje, 2019

## TABLE OF CONTENTS

		page
	Used legislative	
	Introduction	
	Mandatory components that have to be incorporated in the study programs of first and second cycle studies	
	Data about/of the higher educational institution	
Attachment 1	General qualification descriptors for detection of knowledge results gained with completion of first and second cycle study program of integrated studies in Veterinary Medicine	
Attachment 2	Specific qualification descriptors for detection of knowledge results gained with completion of first and second cycle study program of integrated studies in Veterinary Medicine	
Attachment 3	Decision on adoption of study program Draft-project by Teaching-Scientific Council of Faculty of Veterinary Medicine – Skopje	
Attachment 4	Decision on adoption of study program Draft-project by Senate of Ss. Cyril and Methodius University in Skopje	
Attachment 5	Determined ratio between compulsory and elective courses, with a list of compulsory courses, list of elective courses, and a defined mode of course selection	
	Realization of the study program	
Attachment 6	Data on the space anticipated for realization of the study program, premises and equipment	
Attachment 7	Tabular view of courses in Veterinary Medicine study program of first and second cycle integrated studies	
	Course programs and information in line with Article 4 from this Book of Rules (Attachment No. 3)	
Attachment 8	A list of teaching staff involved in teaching on first and second cycle study program of integrated studies in Veterinary Medicine with data enlisted in Article 5 (Attachment No. 4)	
Attachment 9	Statement by the teacher with consent to participate in the teaching process in certain courses from the study program	
Attachment 10	Agreement given by the higher educational institution to the teacher for his/her involvement in the realization of the study program	
Attachment 11	Results from the conducted selfevaluation in line with the Guidelines for uniform steps in evaluation and evaluation Procedures brought by the Agency for Evaluation of the Higher Education in RM and by Interuniversity Conference of RM (Skopje-Bitola, September 2002)	

Attachment 12	Opinion of study program Draft-Project given by Confidence and Public Relations Board of Faculty of Veterinary Medicine – Skopje	
	Diploma supplement of the first and second cycle study program of integrated studies in Veterinary Medicine at the Faculty of Veterinary Medicine – Skopje	

## **USED LEGISLATIVE**

Draft-Project of first and second cycle study program of integrated studies in Veterinary Medicine at the Faculty of Veterinary Medicine – Skopje is in compliance with regulations included in:

- 1) Law on High Education in Republic of Macedonia
- 2) Book of rules on organization, work, decision making mode, methodology, accreditation procedure, accreditation criteria and standards, and other issues related with work of Higher Education Accreditation Board of Republic of Macedonia
- 3) Statute of Ss Cyril and Methodius University in Skopje
- 4) Book of rules on conditions, criteria and enrolling and studying rules on first and second cycle university studies at the Ss Cyril and Methodius University in Skopje
- 5) Book of rules on study program adoption at the Ss Cyril and Methodius University in Skopje
- 6) Book of Rules of mandatory components that have to be incorporated in the first, second and third cycle study programs
- 7) Regulation on national frame of higher education qualifications.

## Intorduction

According European Union Directives 2005/36 (Directive 2005/36/EC of the European Parliament and of the Council of 7 September 2005 on the recognition of professional qualifications, *Official Journal of the European Union, L 255/22-142, 30.9.2005*) and 2013/55 (Directive 2013/55/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal Market Information System ('the IMI Regulation'), *Official Journal of the European Union, L 354/132, 28.12.2013*) the profession of veterinary surgeon is included in regulated professions and according Article 38 from Directive 2005/36/EC the veterinary medicine curriculum must have duration of at least 5 years, so organization of particular first and second cycle studies is not possible, and they must be organized as integrated studies (first + second cycle). With completion of these studies the students are able for direct entry on third cycle of university PhD studies. For studies of veterinary medicine exactly defined courses with compulsory theoretical and practical teaching realized within the faculty are predicted, and they are given in Anex V.4 of Directive 2005/36/EC and Anex V.4.1. of Directive 2013/55/EC, respectively.

Integrated studies in Veterinary Medicine at the Faculty of Veterinary Medicine – Skopje are prepared according European Union directives mentioned above, Bologna Declaration and national legislative related with higher education mentioned above. The first attempt to create a curriculum of veterinary medicine which would be accepted internatonally was even in 2002-2003 when an international project entitled "Improvement of Veterinary Education in the Former Yugoslav Republic of Macedonia" was realized by FVMS within European Union Tempus-Phare program (Joint European Project No CD\_JEP-15017-2000). In this project partners were the former Royal Veterinarian School (today UCPH School of Veterinary Medicine and Animal Science within the Faculty of Health and Medical Sciences at University of Copenhagen) in Copenhagen (Denmark), Faculty of Veterinary Medicine within Justus-Liebig-University in Giessen (Germany) and Royal "Dick" Veterinary College (today Royal "Dick" School of Veterinary Studies) in Edinburgh (Scotland – United Kingdom). The draft-curriculum which was created with this project was used as a basis for creation of the FVMS' first study program organized according Bologna principles and ECTS system, and it started with function in academic year 2006/2007. Completion of Bologna process implementation was predicted with Law on Higher Education (LHE) from 2008, where university studies were defined as studies of first, second and third cycle, respectively. So, some amandments and changes into FVMS' veterinary medicine curriculum have to be made, and it was now defined as study program of first and second cycle integrated studies in Veterinary Medicine. All courses enlisted in Anex V.4 from EU Directive 2005/36 were incorporated as compulsory, and also is was put on mind to fulfil student workload criteria per study year, which were also predicted in LHE. This new curriculum was accredited by the Higher Education Accreditation Board of Republic of Macedonia (Decision No. 12-107/1 from 19.11.2009) and started to function in academic year 2009/2010. In 2011, additional changes and amandments of the curriculum were made, according regulations from National frame of professional qualifiactions (the descriptors) and Book of Rules of mandatory components that have to be incorporated in the study programs adopted by Higher Education Accreditation and Evaluation Board of Republic of Macedonia. These changes and amandments of the curriculum were accredited by Higher Education Accreditation and Evaluation Board with Decision No. 12-14/2 from 12.03.2013.

According LHE the study programs have to be re-accredited every five years, so in 2017 FVMS started a procedure for re-accreditation of its veterinary curriculum. Basis of these current curriculum changes were recommendations given by the European Association of

Establishments for Veterinary Education – EAEVE (European accreditation body in the field of veterinary medicine) pre-visit team during their consultative visitation of the Faculty of Veterinary Medicine – Skopje in 2016, related with FVMS' aspirations for getting international accreditation of its study program. Current changes and amendments of the study program of first and second cycle integrated studies in Veterinary Medicine at the Faculty of Veterinary Medicine – Skopje include increasing of practical teaching hours (laboratory practicals and field practice) and introducing some novel program courses, which since now were not enlisted, and this is according the Standard Operative Procedure (SOP) adopted on the EAEVE General Assembly in Uppsala (Sweden) in 2016. These changes and amendments were accredited by Higher Education Accreditation and Evaluation Board with Decision No. 1409-402/2 from 23.02.2018, and the new curriculum started with function in this academic year 2018/2019. This Draft-Project on study program of first and second cycle integrated studies in Veterinary Medicine in English is based of the veterinary curriculum mentioned above.

## Mandatory components that have to be incorporated in the first and second cycle study programs

### Data about/of the higher educational institution

Name of the higher educational institution	Republic of Macedonia Ss. Cyril and Methodius University in Skopje Faculty of Veterinary Medicine – Skopje
Address	Lazar Pop Trajkov, 5/7, 1000 Skopje
Type of the higher educational institution	Public higher educational institution
Data/information on the founder	Parliament of the Republic of Macedonia
Web/url address	Data for the study program are available on Ss Cyril and Methodius University in Skopje web-address <a href="http://ukim.edu.mk/">http://ukim.edu.mk/</a> and Faculty of Veterinary Medicine – Skopje web-address <a href="https://fvm.ukim.edu.mk/">https://fvm.ukim.edu.mk/</a>
Data on the last accreditation process	Integrated studies in Veterinary medicine (I+II cycle), accreditation decision No. 12-14/2 from 12.03.2013 Integrated studies in Veterinary medicine (I+II cycle), accreditation decision No. 1409-402/2 from 23.02.2018 Doctoral (PhD) studies in Veterinary medicine (III cycle), accreditation decision No. 17-361/5 from 09.03.2017 Doctoral (PhD) studies in Food safety (III cycle), accreditation decision No. 17-360/4 from 09.03.2017
Study and research fields for which accreditation has been obtained	4. Biotechnical sciences 407 Veterinary medicine
Units within the higher educational institution	Veterinary Institute Institute of Food Institute of Reproduction and Biomedicine
Number of students for whom accreditation was obtained	15
Study programs realized in the Unit that requires broadening of the activities by introducing new study program/s	Integrated studies in Veterinary medicine (I+II cycle) Doctoral (PhD) studies in Veterinary medicine (III cycle) Doctoral (PhD) studies in Food safety (III cycle)
Data on international collaboration related to education, research and student mobility	Faculty of Veterinary Medicine – Skopje is working extensively on promoting international cooperation via many activities, as making contracts on bilateral cooperation within contracts previously made by the University, as well as via its own contracts with other veterinary faculties abroad. Teaching staff and student mobility is realized according

	<p>international contracts within Erasmus+ and CEEPUS mobility programs. CEEPUS program mobility is realized within the international faculty network VetNEST, where Faculty of Veterinary Medicine – Skopje is affiliate member since 2007. From that year the Faculty regularly participates in annual meetings of this network which are organized every year by different network member. On this meeting members exchange informations for eventual organization changes, the progress in EAEVE evaluation process, and also CEEPUS coordinators are planning mobility schedule, and other forms of cooperation are discussed.</p> <p>Also, Faculty of Veterinary Medicine – Skopje participates as a partner in international faculty network VETistanbul Group since its establishing in 2013 and has participated in all until now congresses organized by this network.</p> <p>Faculty of Veterinary Medicine – Skopje has long-term strategy for gaining international accreditation of its veterinary medicine curriculum, and for that reason FVMS became affiliate member of EAEVE since 1996 and regularly participates on annual assemblies of this association, and in 2016 an EAEVE expert team consultative visitation was realized.</p> <p>Also, Faculty of Veterinary Medicine – Skopje realizes lectures by visiting-teachers from renowned universities from the region, according University's programs on visiting-teachers.</p>
<p>Data on the space for realization of educational and research activities</p>	<p>All Faculty activities (educational, research and applicative) are performed in Faculty's own premises, with exception of teaching in course Biophysics, which is performed at the Institute of Physics within Faculty of Natural Sciences and Mathematics, as well as field and extra mural practice which are performed in veterinary ambulances, livestock farms and food industry enterprises. The Faculty facilities include:</p> <p>5 buildings with total area of 3600 m<sup>2</sup>; 3 lecture rooms (50, 40 and 30 seats, respectively), 5 practical classrooms, 3 classrooms, library, 15 laboratories, 2 section rooms, 1 clinic and 1 radiology cabinet.</p>

Data on the equipment used during lectures and research activities	Given in Attachment A of this document.
Number of persons elected in teaching-research, research and teaching titles	37 in total: 14 full professors, 7 associate professors, 10 assistant professors, 1 research scientist and 7 research associates
Number of persons elected in associate titles	1 assistant
Data on the last external evaluation of the University	The last external evaluation of Ss Cyril and Methodius University was realized in April 2011 (follow up evaluation) for four year period – 2006/2007-2009/2010, and in October 2014 for period 2010/2011-2012/2013. This evaluation was done by the expert team from the European University Association (EUA). In the meantime, new self-evaluation and external evaluation of UKIM was also realized. An follow up evaluation of UKIM for period 2013/2014-2015/2016 was realized in October 2017.

## Qualification descriptors

### Attachment 1

<b>Attachment No. 1a. General qualification descriptors for detection of knowledge results gained with completion of first and second cycle study program of integrated studies in Veterinary Medicine</b>	
Knowledge and understanding	<p>The student shows knowledge and understanding in the field of veterinary medicine, with use of methods relevant for solving of complex cases, and he/she can show originality in development and/or application of authentic ideas for research purpose.</p> <p>Shows ability for use of extended and improved knowledge.</p> <p>Shows high level of professional competence within veterinary medicine in total.</p> <p>Shows knowledge in various disciplines within veterinary medicine, based on most relevant international research in related discipline.</p>
Application of acquired knowledge and understanding	<p>The student shows ability for critical, authentic and creative solving of cases on his/her original way, at the level of the field of veterinary medicine or at multidiscipline level.</p>
Assessment ability	<p>The student shows ability for synthesis and integration of knowledge gained not only during the studies, but also during his/her professional engagement.</p> <p>Shows ability for coping complex issues from professional aspect, appropriate assessment of such issues even with incomplete and limited data, but with sense about the personal, social and ethical responsibilities during application of gained knowledge and assessment.</p> <p>Shows ability for assessment and selection of scientific theories, methodologies, tools and professional skills in veterinary medicine, and for founding novel science-based analyses and solutions.</p>
Communication skills	<p>The student shows ability for exchange of conclusions, suggestions and opinions with aid of arguments and their rational supportation, with professional and wide publicity, clearly and unequivocally.</p> <p>Shows ability for taking significant responsibility for his/her personal, and also mutual results.</p> <p>Shows ability for initiation and performing activities within his/her professional competencies.</p>
Learning skills	<p>The student shows ability of recognition of the personal need for continuous improvement of previously gained knowledge and ability for independent activity in gaining new knowledge and skills within society.</p> <p>Shows ability for taking responsibility for further professional development and improvement within veterinary medicine and more wide.</p>

## Attachment 2

### **Attachment No. 1b. Specific qualification descriptors for detection of knowledge results gained with completion of first and second cycle study program of integrated studies in Veterinary Medicine**

Qualifications which claim successful completing first and second cycle integrated studies – 330 ECTS credit points are assigned to person who fulfills following qualification descriptors. These qualifications are in compliance with recommendations of European Association of Establishments for Veterinary Education – EAEVE (so-called day-one skills).

<p>Knowledge and understanding</p>	<ul style="list-style-type: none"> <li>- Shows extended knowledge and understanding of scientific disciplines which are basis of veterinary doctors' activities.</li> <li>- Shows knowledge about research methods which are in use in basic and applied research in all aspects of veterinary science.</li> <li>- Shows extended knowledge about structure and function of normal animals and their rearing.</li> <li>- Shows extended knowledge about ethiology, pathogenesis, clinical signs, diagnostics and treatment of common diseases and disorders which occur in common domestic animal species in EU.</li> <li>- Shows knowledge about legislative related with animal welfare (including transport) and notifiable, reportable and zoonotic diseases.</li> <li>- Shows knowledge about legislative of drugs and manuals on responsible use of drugs adopted by EU member states.</li> <li>- Shows knowledge about principles of disease prevention and development of health and welfare.</li> <li>- Shows knowledge about issues related with public health including zoonoses.</li> </ul>
<p>Application of knowledge</p>	<ul style="list-style-type: none"> <li>- Shows ability for getting correct and relevant anamnesis for particular animal or group of animals, as well as for their environment.</li> <li>- Shows ability for safe and human handling with an animal, and to conduct others for use of such technics.</li> <li>- Shows ability for performing complete clinical examination.</li> <li>- Shows ability for carrying out of all common domestic animal species in case of emergency and to perform basic first aid (problems which have to be copied for any species include first aid and coping bleedings, wounds, breath difficulties, eyes and ears injury, loss of consciousness, clinical trauma, burns, tissue injury, internal organ injury and cardiac arrest. First aid which has to be used includes bonding, cleaning, extremity immobilization, reanimation procedures, and control of bleeding).</li> <li>- Shows ability for samples collecting, storing and transporting.</li> <li>- Shows ability for performing standard laboratory tests and interpretation of results not only of tests done by him-/herself, but also of those obtained from other laboratories.</li> <li>- Shows ability for using radiographic, ultrasonic and other technic equipment which is used in diagnostics, safely and in compliance with current regulations.</li> <li>- Shows ability for using appropriate procedures in diagnostics of notifiable, reportable and zoonotic infectious diseases.</li> <li>- Shows ability for correct performing certification.</li> <li>- Shows ability for accessing to relevant data sources for registered drugs.</li> </ul>

	<ul style="list-style-type: none"> <li>- Shows ability for correct and responsible prescribing and dissoluting of drugs in compliance with relevant legislative and to ensure that drugs and garbage are safely stored or removed.</li> <li>- Shows ability for correct use of surgical equipment sterilization principles.</li> <li>- Shows ability for correct use of aseptical surgery principles.</li> <li>- Shows ability for safe performing of sedation, general and local anesthesia, and pain calming and control.</li> <li>- Shows ability for advising and application of appropriate treatment.</li> <li>- Shows ability for performing of human euthanasia, with use of appropriate method, and simultaneously to show empathy for owner's and other persons' feelings, to maintain safety of present persons, and to give advise for correct corpse removing.</li> <li>- Shows ability for performing general necropsy, registrating details, taking tissue samples, and their correct storing and transporting.</li> <li>- Shows ability for performing pre- and postmortal examination of food production animals and correct identification of condition which have impact on quality and safety of animal origin products.</li> <li>- Shows ability for obtaining and implementing of general records on health and welfare (including production records where is needed).</li> <li>- Shows ability for creating and application of preventive and prophylactic programs related to the specied (herd health) and maintance of approved healh standards, as well as welfare and public health standars, and seeking advice and help from the colleagues if needed.</li> <li>- Shows ability for minimization of threats of contamination, cross-infection and pathogene accumulation in premises and on field.</li> </ul>
Ability assessment	<ul style="list-style-type: none"> <li>- Shows ability for evaluation of evidence.</li> <li>- Shows ability of correct interpretation of clinical finding and its linking with laboratory and diagnostic imaging tests.</li> <li>- Shows ability for correct evaluation of the animal's nutritive status, and ability to advise the client about principles of nutrition and animal husbandry.</li> <li>- Shows ability to recognize necessity of euthanasia.</li> </ul>
Communication skills	<ul style="list-style-type: none"> <li>- Shows ability for efficient communication with clients, and for giving public, professional, collegial and responsible questions; for effient listening and empathic responding, and using speech appropriate for the interlocutor.</li> <li>- Shows ability for preparing clear case report and maintance of patient records in form appropriate for the colleagues and understandable for the publicity.</li> <li>- Shows ability for efficient work as a member of interdisciplinary team.</li> <li>- Shows consciousness about ethical responcibilites of the veterinary doctor related with patient care and client relationship, and also more general with the community related with their eventual impact on environment and society in total.</li> <li>- Shows consciousness about economical and emotional ambient where veterinary doctor works, and ability for solvent response on such factors impacts.</li> <li>- Shows will to use his/her professional qualities for contribution of as good as it can for veterinary medicine development with goal of improving of</li> </ul>

	<p>veterinary practice and increasing quality of animal care, animal welfare and veterinary public health.</p> <ul style="list-style-type: none"> <li>- Shows basic knowledge on organization and management of veterinary practice, including: <ul style="list-style-type: none"> <li>o consciousness about his/her professional obligations related with employment and health;</li> <li>o safety legislative, and his/her position via staff and publicly.</li> </ul> </li> <li>- Shows knowledge about price calculation, invoice making, and importance of handling with systems of records and booking, including: <ul style="list-style-type: none"> <li>o computer records and reports;</li> <li>o ability for efficient use of informatics technology and for communication and data sharing, collecting, handling and analysing;</li> <li>o importance for harmonization with established standars and practice policy;</li> </ul> </li> <li>- Shows ability to act professionally related with professional and legal responcibilities, and to understand and apply ethical codices of related regulatory bodies.</li> <li>- Shows ability to cope with ambiguities and to adapt him-/herself on changes.</li> <li>- Shows consciousness about personal limits, and demonstrates consciousness when and from whom to ask professional advice, help and support.</li> <li>- Shows general knowledge of veterinary practice.</li> </ul>
Learning skills	<ul style="list-style-type: none"> <li>- Shows understanding of professional duites, for devotion to continuous education and training, for need of professional development, during his/her whole professional life.</li> </ul>

## **Attachment 5: Determined ratio between compulsory and elective courses, with a list of compulsory courses, list of elective courses, and a defined mode of course selection**

As mentioned above, veterinary profession in European Union is defined as a regulated profession, according to EU Directives 2005/36 and 2013/55. For this reason, the veterinary medicine curriculum at FVMS is designed as a first and second cycle integrated study program, and does not apply a ratio between compulsory and elective courses (60 : 30 : 10) determined by Law on Higher Education article 139, which is in compliance with paragraph 3 from the article mentioned above and with article 147, paragraph 1, item 7, respectively, which allow University units to create curricula related to regulated professions by their own. Directives 2005/36 and 2013/55 contain a list of courses which have to be compulsory (so-called “core”): basic, preclinical and clinical, and these are included in the first ten semesters of this curriculum. Besides them, students have to select and complete some of the offered elective courses, which are predicted for every study year in different ranges, also in the first ten semesters. These elective courses are different by their characteristics, and cover various veterinary medicine disciplines, and, in fact, they are an extension of knowledge gained with the compulsory courses. In the first three study years, students can select them by their own choice, and in the fourth and fifth year, according to the tendency of specialized additional education, every student has the ability to select by his/her own choice particular courses from four groups of elective courses (1. companion animals; 2. farm animals; 3. hygiene of animal products and veterinary public health; and 4. biology and pathology of fish, bees and game and ecology). Some of them are offered in different semesters, so once a selected course can not be selected again in some other semester. The number of compulsory courses is 52, and the number of elective courses is 60, and students select among them 10-11 in total. The tabular view of the compulsory and elective courses is given in Attachment 7.

## **Realization of the study program**

### **1. Data on the space anticipated for realization of the study program**

Teaching process at FVMS is realized in Faculty's own premises, with exception of course Biophysics which teaching is performed at the Faculty of Natural Sciences and Mathematics in Skopje. FVMS has one amphitheatre and two lecture rooms with 160 seats in total for realization of teaching. This facilities are equipped with current audio-visual equipment (LCD projectors, interactive school boards) and personal computers linked in Faculty's intranet and with internet access.

For performing of practical teaching students have available 5 practical classrooms (for chemistry, biochemisgtry, physiology and pathophysiology; for microbiology, infectious diseases and avian diseases; for parasitology; for pharmacology and toxicology; for radiology; and computer classroom), 2 section rooms (anatomy hall and obduction hall), as well as 2 rooms for clinical teaching and 1 anesthesia and surgery room within University Hospital for companion animals. Within Department of functional morphology there is also laboratory of plastination where persistent anatomic models are produced, for needs of practical teaching of course Anatomy of animals.

Extra mural practice is realized at many veterinary enterprises, livestock farms and other enerprises which have contract with Faculty of Veterinary Medicine – Skopje for that purpose.

The equipment used in teaching process is enlisted in **Attachment 6** from this document.

### **2. Course programs and information (previously delivered)**

Teaching process in elective courses includes mainly seminars (work in smaller groups) and/or practical tehaching (laboratory/clinical practicals, field practice). Optionally, if on some elective course large number of students are applied, teaching can be organized as cabinet lectures.

### **3. List of teaching staff with related data**

Study program of first and second cycle integrated studies in Veterinary medicine is in total performed by teachers employed at the Faculty of Veterinary Medicine – Skopje within Ss Cyril and Methodius University in Skopje, with exception of curses Biophysics, which is held by teacher from Faculty of Natural Sciences and Mathematics in Skopje, Health and sport, held by teacher from Faculty of Physical education, sport and health, and Veterinary legislative, which is held by teacher from Economic Institute, all these institutions are units of Ss Cyril and Methodius University in Skopje. These are following teachers:

*Teachers from Faculty of Veterinary Medicine – Skopje*

#### ***Full professors***

- Prof. Velimir Stojkovski, PhD
- Prof. Risto Prodanov, PhD
- Prof. Misho Hristovski, PhD
- Prof. Toni Dovenski, PhD

- Prof. Vlatko Ilieski, PhD
- Prof. Plamen Trojchanec, PhD
- Prof. Vladimir Petkov, PhD
- Prof. Romel Velez, PhD
- Prof. Dine Mitrov, PhD
- Prof. Igor Ulchar, PhD
- Prof. Pavle Sekulovski, PhD
- Prof. Zehra Hajrulai-Musliu, PhD
- Prof. Blagica Sekovska, PhD
- Prof. Slavcho Mrenoshki, PhD

***Associate professors***

- Prof. Jovana Stefanovska, PhD
- Prof. Florina Popovska-Perchinikj, PhD
- Prof. Lazo Pendovski, PhD
- Prof. Dean Jankuloski, PhD
- Prof. Aleksandar Dodovski, PhD
- Prof. Trpe Ristoski, PhD

***Assistant professors***

- Ass. Prof. Igor Djadjovski, PhD
- Ass. Prof. Kiril Krstevski, PhD
- Ass. Prof. Nikola Adamov, PhD
- Ass. Prof. Branko Atanasov, PhD
- Ass. Prof. Ksenija Ilievska, PhD
- Ass. Prof. Iskra Cvetkovikj, PhD
- Ass. Prof. Irena Celeska, PhD
- Ass. Prof. Sandra Mojsova, PhD
- Ass. Prof. Mirko Prodanov, PhD
- Ass. Prof. Elena Atanaskova Petrov, PhD

***Teachers engaged from other faculties/institutions:***

- Prof. Zhaneta Popeska, PhD (Faculty of Computer Sciences and Engineering)
- Prof. Suzana Topuzoski, PhD (Faculty of Natural Sciences and Mathematics)
- Prof. Elena Davitkovska, PhD (Economic Institute)
- Senior Lecturer Suzana Simeva, MSc (Faculty of Physical Education, Sport and Health)

Data related with teachers involved in teaching on first and second cycle integrated studies in Veterinary medicine at the Faculty of Veterinary Medicine – Skopje are given in **Attachemnt 8** from this document.

**Tabular view of program courses in first and second cycle  
integrated study program in**

**VETERINARY MEDICINE**

## Study plan of first and second cycle integrated studies in Veterinary medicine

1 credit point (CP) = 25 hours cabinet lectures/practicals/self-directed learning (SDL) / 16 hours field practice

### Compulsory program courses

I semester – total hours: 750

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM111	Anatomy of animals	60	75	5.4	90	3.6	9.0
FVM112	Cell biology	30	45	3.0	65	2.6	5.6
FVM113	Biophysics	15	30	1.8	65	2.6	4.4
FVM114	Chemistry	30	45	3.0	50	2.0	5.0
FVM115	Biostatistics	15	30	1.8	17.5	0.7	2.5
FVM116	Histology with embryology	30	45	3.0	12.5	0.5	3.5
	Total teaching	180	270				
	<b>Total</b>	<b>450</b>		<b>18.0</b>	<b>300</b>	<b>12.0</b>	<b>30.0</b>

II semester – total hours: 750

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM111	Anatomy of animals	60	75	5.4	77.5	3.1	8.5
FVM116	Histology with embryology	30	45	3.0	50	2.0	5.0
FVM117	Biochemistry	60	60	4.8	80	3.2	8.0
FVM118	Nutritious, healing and poisonous plants	15	30	2.0	30	1.0	3.0
FVM216	Rural economy	15	15	1.2	20	0.8	2.0
	Elective course	15		0.6	22.5	0.9	1.5
FVM120	Health and sport		30	1.2	20	0.8	2.0
	Total teaching	195	255				
	<b>Total</b>	<b>450</b>		<b>18.2</b>	<b>300</b>	<b>11.8</b>	<b>30.0</b>

III semester – total hours: 765

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM211	Physiology of animals	45	30	3.0	42.5	1.7	4.7
FVM212	Nutrition of domestic animals	30	30	2.4	47.5	1.9	4.3
FVM213	Animal husbandry	30	30	2.4	47.5	1.9	4.3
FVM214	Animal hygiene	30	45	3.0	35.0	1.4	4.4
FVM215	Microbiology	30	45	3.0	52.5	2.1	5.1
FVM217	Immunology	15	30	1.8	35	1.4	3.2
	Elective subject(s)	15	15	1.2	20	0.8	2.0

	Total teaching	210	240				
	<b>Total</b>	<b>450</b>		<b>17.4</b>	<b>315</b>	<b>12.6</b>	<b>30.0</b>

**IV semester – total hours: 750**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM211	Physiology of animals	60	75	5.4	90	3.6	9.0
FVM212	Nutrition of domestic animals	30	45	3.0	37.5	1.5	4.5
FVM213	Animal husbandry	30	30	2.4	52.5	2.1	4.5
FVM214	Animal hygiene	15	30	1.8	42.5	1.7	3.5
FVM215	Microbiology	30	45	3.0	37.5	1.5	4.5
FVM218	Communication in veterinary practice	15	15	1.2	20	0.8	2.0
	Elective course(s)	15	15	1.2	20	0.8	2.0
	Total teaching	195	255				
	<b>Total</b>	<b>450</b>		<b>18</b>	<b>300</b>	<b>12.0</b>	<b>30.0</b>

**V semester – total hours: 765**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM311	Pathophysiology	30	45	3.0	52.5	2.5	4.5
FVM312	Pharmacology	30	30	2.4	40	1.6	4.0
FVM313	Pathology	30	45	3.0	62.5	2.5	5.5
FVM314	Parasitology and parasitic diseases	30	30	2.4	40	1.6	4.0
FVM315	Clinical anatomy of animals		45	2.0	30	1.0	3.0
FVM317	Diagnostic imaging methods	15	30	2.0	30	1.0	3.0
FVM118	Clinical biochemistry	15	15	1.2	20	0.8	2.0
	Elective course(s)	30	30	2.4	40	1.6	4.0
	Total teaching	180	270				
	<b>Total</b>	<b>450</b>		<b>18.4</b>	<b>315</b>	<b>11.6</b>	<b>30.0</b>

**VI semester – total hours: 750**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM311	Pathophysiology	30	30	2.4	40	1.6	4.0
FVM312	Pharmacology	30	45	3.0	50	2.0	5.0
FVM313	Pathology	60	60	4.8	55	2.2	7.0
FVM314	Parasitology and parasitic diseases	30	45	3.5	50	2.5	5.0
FVM119	Ethology and animal welfare	15	15	1.5	45	1.5	3.0

FVM319	Clinical and laboratory diagnostics in companion animals and equines	15	30	1.8	30	1.2	3.0
FVM316	Clinical and laboratory diagnostics in farm animals	15	30	1.8	30	1.2	3.0
	Total teaching	180	270				
	<b>Total</b>	<b>450</b>		<b>18.8</b>	<b>300</b>	<b>11.2</b>	<b>30.0</b>

**VII semester – total hours: 750**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM411	Internal diseases in companion animals and equines	30	60	3.6	47.5	1.9	5.5
FVM412	Reproduction	45	60	4.2	70	2.8	7.0
FVM413	General surgery with anesthesiology	30	60	3.6	60	2.4	6.0
FVM415	Internal diseases in farm animals	45	45	3.6	60	2.4	6.0
FVM517	Veterinary toxicology	15	15	1.2	20	0.8	2.0
FVM518	Ophthalmology	15	15	1.2	20	0.8	2.0
	Elective course		15	0.6	22.5	0.9	1.5
	Total teaching	180	270				
	<b>Total</b>	<b>450</b>		<b>18.0</b>	<b>300</b>	<b>12.0</b>	<b>30.0</b>

**VIII semester – total hours: 750**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM411	Internal diseases in companion animals and equines	30	45	3.0	50	2.0	5.0
FVM412	Reproduction	60	75	5.4	65	2.6	8.0
FVM414	Infectious diseases in domestic animals	30	30	2.4	52.5	2.1	4.5
FVM415	Internal diseases in farm animals	30	45	3.0	50	2.0	5.0
FVM416	Special surgery with orthopedics	30	60	3.6	60	2.4	6.0
	Elective course(s)		15	0.6	22.5	0.9	1.5
	Total teaching	180	270				
	<b>Total</b>	<b>450</b>		<b>18.0</b>	<b>300</b>	<b>12.0</b>	<b>30.0</b>

**IX semester – total hours: 750**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM416	Special surgery with orthopedics	30	30	2.4	40	1.6	4.0
FVM511	Hygiene and technology of meat, fish, eggs and honey	30	30	2.4	52.5	2.1	4.5
FVM512	Hygiene and technology of milk	30	30	2.4	52.5	2.1	4.5
FVM513	Biology and pathology of fish	30	30	2.4	40	1.6	4.0
FVM414	Infectious diseases in domestic animals	45	45	3.6	35	1.4	5.0
FVM516	Veterinary epidemiology	15	15	1.2	20	0.8	2.0
FVM519	Herd health management		30	1.2	20	0.8	2.0
FVM520	Veterinary legislative	15	15	1.2	20	0.8	2.0
	Elective course(s)		30	1.2	20	0.8	2.0
	Total teaching	195	255				
	<b>Total</b>	<b>450</b>		<b>18.0</b>	<b>300</b>	<b>12.0</b>	<b>30.0</b>

**X semester – total hours: 760**

Program course code	Program course title	Total hours of teaching		Teaching CP's	SDL hours	SDL CP's	Total CP's
		lect.	pract.				
FVM511	Hygiene and technology of meat, fish, eggs and honey	30	45	3.0	25	1.0	4.0
FVM514	Forensic veterinary medicine and veterinary ethics	30	15	1.8	42.5	1.7	3.5
FVM515	Basis of management and management of veterinary practice	15	30	1.8	42.5	1.7	3.5
FVM521	Food safety and veterinary public health	30	30	2.4	40	1.6	4.0
FVM525	Analytical chemistry of food		30	1.2	20	0.8	2.0
FVM522	Biology and pathology of game	15	15	1.2	20	0.8	2.0
FVM523	Biology and pathology of bees	15	30	1.8	42.5	1.7	2.5
FVM524	Avian diseases	45	45	3.6	72.5	2.9	6.5
	Elective course(s)		30	1.8	5	0.2	2.0
	Total teaching	150	300				
	<b>Total</b>	<b>450</b>		<b>18</b>	<b>310</b>	<b>12</b>	<b>30.0</b>

**XI semester – total hours: 495**

Program course code	Program course title	Total hours of teaching	Teaching CP's	SDL hours	SDL CP's	Total CP's
FVM611	Clinical practice: companion animals	150	9.4			9.4
FVM612	Clinical practice: farm animals	150	9.4			9.4
FVM613	Practice in food industry enterprises	150	9.4			9.4
FVM 615	Preparing and presentation of diploma work			45	1.8	1.8
	<b>Total</b>	<b>450</b>	<b>28.2</b>	<b>45</b>	<b>1.8</b>	<b>30.0</b>

**Elective courses**

**I to V semester**

Program course code	Program course title	Total hours of teaching	CP's	Semester
FVM001	Introduction in veterinary medicine	15	1.5	II
FVM007	Anatomy of exotic and laboratory animals	30	2.0	III-IV
FVM006	Chemistry of natural compounds	30	2.0	III-IV
FVM009	Production of bulky feed	30	2.0	III-IV
FVM044	Harmful antinutritive compounds in feed	30	2.0	III-IV
FVM045	Aditives in feed – health modulators	30	2.0	III-IV
FVM013	Economics and organization in livestock production	30	2.0	III-IV
FVM056	Green economics and sustainable development	30	2.0	III-IV
FVM024	Marketing in veterinary practice	15	1.0	IV
FVM058	Veterinary vaccinology	15	1.0	IV
FVM019	Basis of cytological diagnostics	30	2.0	V
FVM020	Veterinary hematology	30	2.0	V
FVM054	Dermatopathology	30	2.0	V
FVM059	Veterinary entomology	30	2.0	V
FVM008	Protection and management of endangered animal species	30	2.0	V
FVM003	Environment protection	15	1.0	V
FVM004	Animal ecology	30	2.0	V
FVM015	Diversity and protection of birds of pray	30	2.0	V
FVM016	Diversitet and protection of fish	30	2.0	V
FVM011	Fish welfare	30	2.0	V
FVM017	Ornamental aquaculture	30	2.0	V

**Elective courses group: Farm animals**

Program course code	Program course title	Total hours of teaching	CP's	Semester
FVM021	Tropical parasitic diseases	15	1.0	VII-VIII
FVM022	Rational application of antimicrobial drugs	15	1.0	VII-VIII
FVM037	Tropical infectious diseases	30	2.0	IX-X
FVM030	Clinical pharmacology	30	2.0	IX-X
FVM047	Toxicology of poisonous plants	30	2.0	IX-X
FVM028	Technological processes in poultry farm	30	2.0	IX-X
FVM038	Breeding and diseases of ostriches	30	2.0	IX-X

FVM039	Breeding and diseases of pigeons	30	2.0	IX-X
FVM035	Advanced reproductive endocrinology	30	2.0	IX-X
FVM052	Ultrasonic diagnostics of reproduction disorders in cows	30	2.0	IX-X
FVM053	Advanced andrology and cryobiology	30	2.0	IX-X
FVM057	Clinical pathophysiology	30	2.0	IX-X
FVM060	Veterinary clinical parasitology	30	2.0	IX-X

### Elective courses group: Companion animals

Program course code	Program course title	Total hours of teaching	CP's	Semester
FVM022	Rational application of antimicrobial drugs	15	1.0	VII-VIII
FVM032	Reconstructive surgery of the integumentary system	15	1.0	VII-VIII
FVM033	Selected surgical procedures in ophthalmology	15	1.0	VII-VIII
FVM034	Selected techniques for surgical fracture reduction	15	1.0	VII-VIII
FVM049	Anesthesia and analgesia techniques in different companion animal species	15	1.0	VII-VIII
FVM019	Basis of cytological diagnostics	30	2.0	IX-X
FVM020	Veterinary hematology	30	2.0	IX-X
FVM057	Clinical pathophysiology	30	2.0	IX-X
FVM023	Cynology	30	2.0	IX-X
FVM036	Clinical nutrition in dogs and cats	30	2.0	IX-X
FVM051	Laboratory profile changes in companion animal diseases	30	2.0	IX-X
FVM055	Veterinary dentistry in dogs and cats	30	2.0	IX-X
FVM030	Clinical pharmacology	30	2.0	IX-X
FVM048	Oncology	30	2.0	IX-X
FVM054	Dermatopathology	30	2.0	IX-X

### Elective courses group: Hygiene of animal products and veterinary public health

Program course code	Program course title	Total hours of teaching	CP's	Semester
FVM026	Management of animal products supply chains	15	1.0	VII-VIII
FVM050	Veterinary inspection	15	1.0	VII-VIII
FVM025	Current food safety systems	30	2.0	IX-X
FVM027	Microbiology of food	30	2.0	IX-X
FVM031	Chemistry of food quality	30	2.0	IX-X
FVM043	Parasitology in public health	30	2.0	IX-X
FVM046	Residues and contaminants in food	30	2.0	IX-X

### Elective courses group: Biology and pathology of fish, bees and game and ecology

Program course code	Program course title	Total hours of teaching	CP's	Semester
FVM018	Sport and hobby fishing	30	2.0	IX-X
FVM029	Aquaculture	30	2.0	IX-X
FVM012	Beekeeping	30	2.0	IX-X
FVM040	Organic apiculture	30	2.0	IX-X
FVM041	Ecological monitoring of bee diseases	30	2.0	IX-X
FVM010	Zoology of wildlife	30	2.0	IX-X
FVM014	Diversity and protection of wild carnivores	30	2.0	IX-X
FVM042	Game diseases management	30	2.0	IX-X
FVM004	Animal ecology	30	2.0	IX-X
FVM005	Ecotoxicology	30	2.0	IX-X

## List of study program courses with their course teachers

### Compulsory program courses

Program course code	Program course title	Course teacher(s)
FVM111	Anatomy of animals	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD
FVM112	Cell biology	Prof. Velimir Stojkovski, PhD
FVM113	Biophysics	Prof. Suzana Topuzoski, PhD
FVM114	Chemistry	Prof. Zehra Hajrulai-Musliu, PhD
FVM115	Biostatistics	Prof. Zhaneta Popeska, PhD Ass. Prof. Nikola Adamov, PhD
FVM116	Histology with embryology	Prof. Florina Popovska-Perchinikj, PhD
FVM117	Biochemistry	Prof. Velimir Stojkovski, PhD
FVM118	Nutritious, healing and poisonous plants	Prof. Risto Prodanov, PhD Prof. Romel Velez, PhD
FVM119	Ethology and animal welfare	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD
FVM120	Health and sport	senior lect. Suzana Simeva, MSc
FVM211	Physiology of animals	Prof. Vladimir Petkov, PhD
FVM212	Nutrition of domestic animals	Prof. Risto Prodanov, PhD
FVM213	Animal husbandry	Ass. Prof. Nikola Adamov, PhD
FVM214	Animal hygiene	Prof. Aleksandar Dodovski, PhD
FVM215	Microbiology	Prof. Slavcho Mrenoshki, PhD Ass. Prof. Iskra Cvetkovikj, PhD
FVM216	Rural economy	Prof. Blagica Sekovska, PhD
FVM217	Immunology	Prof. Slavcho Mrenoshki, PhD Ass. Prof. Iskra Cvetkovikj, PhD
FVM218	Communication in veterinary practice	Prof. Blagica Sekovska, PhD Prof. Plamen Trojchanec, PhD
FVM311	Pathophysiology	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD
FVM312	Pharmacology	Prof. Romel Velez, PhD
FVM313	Pathology	Prof. Trpe Ristoski, PhD
FVM314	Parasitology and parasitic diseases	Prof. Jovana Stefanovska, PhD
FVM315	Clinical anatomy of animals	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD
FVM316	Clinical and laboratory diagnostics in farm animals	Prof. Dine Mitrov, PhD Ass. Prof. Igor Djadjovski, PhD
FVM317	Diagnostic imaging methods	Prof. Dine Mitrov, PhD
FVM318	Clinical biochemistry	Prof. Velimir Stojkovski, PhD
FVM319	Clinical and laboratory diagnostics in companion animals and equines	Ass. Prof. Elena Atanaskova Petrov, PhD
FVM411	Internal diseases in companion animals and equines	Ass. Prof. Elena Atanaskova Petrov, PhD
FVM412	Reproduction	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD
FVM413	General surgery with anesthesiology	Prof. Plamen Trojchanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM414	Infectious diseases in domestic animals	Ass. Prof. Kiril Krstevski, PhD
FVM415	Internal diseases in farm animals	Prof. Dine Mitrov, PhD Ass. Prof. Igor Djadjovski, PhD
FVM416	Special surgery with orthopedics	Prof. Plamen Trojchanec, PhD Ass. Prof. Ksenija Ilievska, PhD

FVM511	Hygiene and technology of meat, fish, eggs and honey	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM512	Hygiene and technology of milk	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM513	Biology and pathology of fish	Prof. Misho Hristovski, PhD
FVM516	Veterinary epidemiology	Ass. Prof. Kiril Krstevski, PhD
FVM517	Veterinary toxicology	Prof. Romel Velez, PhD
FVM518	Ophthalmology	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM519	Herd health management	Prof. Toni Dovenski, PhD Prof. Plamen Trojachanec, PhD Prof. Dine Mitrov, PhD Ass. Prof. Branko Atanasov, PhD Ass. Prof. Ksenija Ilievska, PhD Ass. Prof. Irena Celeska, PhD
FVM520	Veterinary legislative	Prof. Elena Davitkovska, PhD
FVM514	Forensic veterinary medicine and veterinary ethics	Prof. Trpe Ristoski, PhD
FVM515	Basis of management with management of veterinary practice	Prof. Blagica Sekovska, PhD
FVM521	Food safety and veterinary public health	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM522	Biology and pathology of game	Prof. Misho Hristovski, PhD
FVM523	Biology and pathology of bees	Prof. Misho Hristovski, PhD
FVM524	Avian diseases	Prof. Aleksandar Dodovski, PhD
FVM525	Analytical chemistry of food	Prof. Zehra Hajrulai-Musliu, PhD
FVM611	Clinical practice: companion animals	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD Ass. Prof. Irena Celeska, PhD Ass. Prof. Elena Atanaskova Petrov, PhD
FVM612	Clinical practice: farm animals	Prof. Dine Mitrov, PhD Prof. Toni Dovenski, PhD Prof. Plamen Trojachanec, PhD Prof. Jovana Stefanovska, PhD Ass. Prof. Branko Atanasov, PhD Ass. Prof. Ksenija Ilievska, PhD Ass. Prof. Igor Djadjovski, PhD Ass. Prof. Kiril Krstevski, PhD Ass. Prof. Irena Celeska, PhD
FVM613	Practice in food industry enterprises	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM 615	Preparation and presentation of diploma work	coordinated by vice-dean of education

### Elective program courses

Program course code	Program course title	Course teacher(s)
FVM001	Introduction in veterinary medicine	Prof. Toni Dovenski, PhD

FVM003	Environment protection	Prof. Misho Hristovski, PhD
FVM004	Animal ecology	Prof. Misho Hristovski, PhD
FVM005	Ecotoxicology	Prof. Misho Hristovski, PhD
FVM006	Chemistry of natural compounds	Prof. Zehra Hajrulai-Musliu, PhD
FVM007	Anatomy of exotic and laboratory animals	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD
FVM008	Protection and management of endangered animal species	Prof. Misho Hristovski, PhD
FVM009	Production of bulky feed	Prof. Risto Prodanov, PhD
FVM010	Zoology of wildlife	Prof. Misho Hristovski, PhD
FVM011	Welfare of fish	Prof. Misho Hristovski, PhD
FVM012	Beekeeping	Prof. Misho Hristovski, PhD
FVM013	Economics and organization in livestock production	Prof. Blagica Sekovska, PhD Ass. Prof. Nikola Adamov, PhD
FVM014	Diversity and protection of wild carnivores	Prof. Misho Hristovski, PhD
FVM015	Diversity and protection of birds of prey	Prof. Misho Hristovski, PhD
FVM016	Diversity and protection of fish	Prof. Misho Hristovski, PhD
FVM017	Ornamental aquaculture	Prof. Misho Hristovski, PhD
FVM018	Sport and hobby fishing	Prof. Misho Hristovski, PhD
FVM019	Basis of cytological diagnostics	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD
FVM020	Veterinary hematology	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD
FVM021	Tropical parasitic diseases	Prof. Jovana Stefanovska, PhD
FVM022	Rational application of antimicrobial drugs	Prof. Romel Velez, PhD
FVM023	Cynology	Ass. Prof. Elena Atanaskova Petrov, PhD
FVM024	Marketing of veterinary practice	Prof. Blagica Sekovska, PhD
FVM025	Current food safety systems	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM026	Management of animal products supply chains	Prof. Blagica Sekovska, PhD
FVM027	Microbiology of food	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD
FVM028	Technological processes on poultry farm	Prof. Aleksandar Dodovski, PhD
FVM029	Aquaculture	Prof. Misho Hristovski, PhD
FVM030	Clinical pharmacology	Prof. Romel Velez, PhD
FVM031	Chemistry of food quality	Prof. Zehra Hajrulai-Musliu, PhD
FVM032	Reconstructive surgery of the integumentary system	Prof. Plamen Trojchanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM033	Selected surgical procedures in ophthalmology	Prof. Plamen Trojchanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM034	Selected techniques for surgical fracture reduction	Prof. Plamen Trojchanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM035	Advanced reproduction endocrinology	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD
FVM036	Clinical nutrition of dogs and cats	Ass. Prof. Elena Atanaskova Petrov, PhD
FVM037	Tropical infectious diseases	Ass. Prof. Kiril Krstevski, PhD
FVM038	Breeding and diseases of ostriches	Prof. Aleksandar Dodovski, PhD
FVM039	Breeding and diseases of pigeons	Prof. Aleksandar Dodovski, PhD
FVM040	Organic apiculture	Prof. Misho Hristovski, PhD
FVM041	Ecological monitoring of bee diseases	Prof. Misho Hristovski, PhD
FVM042	Management of wildlife diseases	Prof. Misho Hristovski, PhD
FVM043	Parasitology in public health	Prof. Jovana Stefanovska, PhD

FVM044	Harmful antinutritive substances in feed	Prof. Risto Prodanov, PhD
FVM045	Additives in feed – health modulators	Prof. Risto Prodanov, PhD
FVM046	Residues and contaminants in food	Prof. Zehra Hajrulai-Musliu, PhD
FVM047	Toxicology of poisonous plants	Prof. Romel Velez, PhD
FVM048	Oncology	Prof. Trpe Ristoski, PhD
FVM049	Anesthesia and analgesia techniques in different companion animal species	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD
FVM050	Veterinary inspection	Prof. Risto Prodanov, PhD Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD
FVM051	Laboratory profile changes in companion animal diseases	Ass. Prof. Elena Atanaskova Petrov, PhD
FVM052	Ultrasonic diagnostics of reproductive disorders in cows	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD
FVM053	Advanced andrology and cryobiology	Prof. Toni Dovenski, PhD
FVM054	Dermatopathology	Prof. Trpe Ristoski, PhD
FVM055	Veterinary dentistry in dogs and cats	Ass. Prof. Ksenija Ilievska, PhD Ass. Prof. Elena Atanaskova Petrov, PhD
FVM056	Green economy and sustainable development	Prof. Blagica Sekovska, PhD
FVM057	Clinical pathophysiology	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD
FVM058	Veterinary vaccination	Prof. Slavcho Mrenoshki, PhD Ass. Prof. Iskra Cvetkovikj, PhD
FVM059	Veterinary entomology	Prof. Jovana Stefanovska, PhD
FVM060	Veterinary clinical parasitology	Prof. Jovana Stefanovska, PhD

### Extra mural practice

Coordinator: Prof. Plamen Trojachanec, PhD

Extra mural practice is predicted for every study year with 240 hours per year. It is condition for enrolling of every further study year. In the first five study years it has to be realized in some ambulances, farms and industrial enterprises, by student's own choice. Extra mural practice is not included in study program credit points, but it will be noted in student's diploma supplement. Students' activities during this practice are documented by the extra mural practice coordinator.

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Anatomy of animals		
2.	Code	FVM111		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	First year/winter and summer semester	ECTS credit points	17.5
8.	Teachers	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> <i>Theory classes</i> of the course Anatomy of animals aim to introduce students to the scope and field of anatomy, the position of domestic species in zoological system, division the animal body into organ systems, to learn the descriptive terms and the body regions. In the course, the students will study in detail the topographical anatomy of locomotors system, separately the topographic anatomy of the front limbs, hind limbs and the spinal cord, the anatomy of the thorax and abdominal wall. <i>Practicals</i> of the course Anatomy of animals aim to introduce the students with the general descriptive terms used in anatomy as well with the plains of the body with description of joints and muscles movements. During the practical dissection of cadavers the students will become familiar with the topographical anatomy of the forelimb, hindlimb, topographical anatomy of the column vertebrae, the anatomy of the chest wall and the wall of the abdominal cavity, practically studying the bones, dissection muscles, joints and ligaments, and dissection of blood vessels and nerves.			
11.	<b>Brief content</b> Basic facts and concepts of anatomy, Locomotor apparatus (forelimb), Locomotor apparatus (hindlimb), Locomotor apparatus (axial skeleton, anatomy of the thoracic wall, anatomy of the abdominal wall), Topographic anatomy of head and neck, Topographic anatomy of a thorax, Topographic anatomy of the abdomen, Topographic anatomy of pelvis, The central nervous system, Sensory organs and the common integument			
12.	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students; video presentations, slide presentations, CLIVE computer interactive software). Practicals: practicals and other ways of work with smaller groups. Realized by work in dissection room and work on anatomic models (work with native, fixed and plastinated models). Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.			
13.	Total available time	437 hours		
14.	Organization of the course	I semester: Theory classes: 4 hours per week (60 hours) Practicals: 5 hours per week (75 hours) II semester: Theory classes: 4 hours per week (60 hours) Practicals: 5 hours per week (75 hours)		
15.		15.1	Lectures - theory classes	120 hours

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>150 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>167.5 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			Attendance on theory classes	12	15
			Attendance and activity (knowledge) on practicals	12	15
			Written essay	6	10
		Tests	30	60	
		Final exam	predicted		
		<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test. Final exam is predicted. Student who did not pass one of the tests during the semester goes to final exam.		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Test (after every completed module):</b> written <b>Final exam:</b> predicted		
<b>22.</b>	<b>Textbooks</b>				
	<b>22.1</b>	<b>Mandatory</b>			

		<ol style="list-style-type: none"> <li>1. L Konig H.E., Liebich H.-G. Veterinary anatomy of domestic animals. Schattauer(Stuttgart – new York) textbook and Colour Atlas, 2004</li> <li>2. Sisson S., The anatomy of domestic animals. W.B. Saunders Company. Philadelphia and London, 1941</li> <li>3. Dyce K.M., Sack W.O., Wensing C.J.G. Textbook of veterinary anatomy. W.B. Saunders Company. Philadelphia- London-Toronto-Sydney_Montreal-Tokyo.1996</li> <li>4. Evans E., de Lahunta A. Guide to the dissection of dog. W.B Saunders Company Philadelphia-London-Toronto. 1971</li> <li>5. Evans E., Christensen G. Anatomy of the dog. W.B Saunders Company Philadelphia-London-Toronto. 1979</li> <li>6. Nomina Anatomica Veterinaria. International committee on veterinary Gross anatomical Nomenclature, Gent, Belgium,1992</li> </ol>				
	22.2	<b>Additional</b>				
		<b>No.</b>	<b>Author</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>
		1.				
		2.				
		3.				
		4.				

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
1.	<b>Program course title</b>	<b>Cell biology</b>		
2.	<b>Code</b>	<b>FVM112</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>First year/winter semester</b>	<b>ECTS credit points</b>	<b>5.6</b>
8.	<b>Teacher</b>	<b>Prof. Velimir Stojkovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> <i>Theory classes</i> The aim of the study of the Cell Biology is to familiarize students with introductory and basic knowledge about the basic structural and functional unit of the living organism - the cell. Students are introduced to subcellular cell structures, their construction and function. Also especially the structure and the function of the chromosome are well elaborated as an introduction to genetics. All theoretical knowledge, the students will verify through biochemical work and practicals. The Cell Biology as a basic course helps students to gain knowledge about the structure and function of the cell. The main task of this course is to familiarize students with the structure and function of subcellular cell structures and their mutual relation in the functioning of the cell and the living organism. <i>Practicals</i> In the course of the practical laboratory work the students will acquire basic experience in experimental work with biological materials. They will get familiar with the principles and methods of microscopy and analysis of the material. The students are obligated to develop a short project that will summarize their knowledge of the biology of the cell.			

	The Cell Biology together with Biochemistry are basic courses which provide the basis for the study of other preclinical and clinical courses such as Microbiology, Immunology, Pharmacology, Pathophysiology, and others.			
<b>11.</b>	<b>Brief content</b> <b>Theory classes</b> Methods in cell biology, Evolution of the cell, Organization of the cells, Chemical composition of the cell, Eukaryotic cell and its organization, Cell membrane, Subcellular cell organization, Genetics, Mechanisms of cell division <b>Practicals</b> Introduction to microscopy, Microscopy of procaryotic and eucaryotic cells, Microscopy of subcellular cell organization, Division of cell. Mitosis, Meiosis, Gametogenesis, Structure of the DNA molecule, Methods of cytogenetics and caryotype analysis, Basic principles of heredity			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written assay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>140 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>45 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>65 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	6	10
		Attendance on practicals	6	10
		Activity (knowledge) on practicals	6	10
		Written assay	6	10
		Tests (two)	18	30
		Final exam (oral)	18	30
		<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	<ul style="list-style-type: none"> <li>- Attendance on the teaching is not scored if student was absent on more than 20% of classes;</li> <li>- Student who has gained up to 6 points from activity on practicals is liberated from passing practical exam;</li> <li>- Student can pass final exam only with passed practical exam, prepared written assay and up to 42 points gained on any mode;</li> <li>- Student is liberated from passing final exam with passed practical exam, prepared written assay, results shown on two tests and minimum 61 points gained on any mode</li> </ul>		
20.	<b>Teaching language</b>	<b>English</b>		
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: Cell, Organization of cells and subcellular cell organization  Second test: Genetics  <b>Final exam:</b> oral</p>		
22.	<b>Textbooks</b>			
	22.1	<b>Mandatory</b>		
		<ol style="list-style-type: none"> <li>1. Berns, W.M. (1997): <i>Cells</i>. University of California, Irvine.</li> <li>2. Andesirk, T, Andesirk, G. (1996): <i>Biology</i>. Life on Earth. Prentice Hall. Upper saddle River. New Jersey.</li> <li>3. Gould, J., Keetan W. (1996): <i>Biological science</i>. W.W. Norton Company. New York, London.</li> </ol>		
	22.2	<b>Additional</b>		

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Biophysics</b>		
2.	<b>Code</b>	<b>FVM113</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>First year/winter semester</b>	<b>ECTS credit points</b>	<b>4.4</b>
8.	<b>Teacher</b>	<b>Prof. Suzana Topuzoski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>			

	Gaining basic knowledge of physical principles in biological processes and techniques for their investigation, also introducing of physical concepts of the modern diagnostical and therapeutic procedures in veterinary medicine.			
<b>11.</b>	<b>Brief content</b> Basics of biomechanics. Mechanical waves. Sound. Ultrasound. Fluid biomechanics. Hemodynamics. Basics of electromagnetism. Electromagnetic waves. Main principles of the geometrical optics. Eye as a optic system and eye malformations. Microscope. Basics of atomic and nuclear physics. X-rays and their application in medical diagnostics. Radiation physics. Natural and artificial radioactivity. Ionization rays, their influence on living organisms and protection. Dosimetry.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: lectures in large group. Practicals: laboratory work in smaller groups.			
<b>13.</b>	<b>Total available time</b>	<b>110 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week(30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>65 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
<b>17.1</b>	<b>Points gained by student's activities:</b>			
<b>17.2</b>	<i>Type of activity</i>	<i>Points</i>		
		<i>minimum</i>	<i>maximum</i>	
<b>17.3</b>	Attendance on theory classes	3	4	
	Attendance and activity (knowledge) on practicals	8	16	
	Tests (two)	40	80	
	Final exam	optional		
	<b>Total:</b>	<b>51</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b> Student has passed the exam with passing of the two tests (realized during the semester) or with passing the final exam. In both cases student has to gain up to 50% from the maximal number of points for every test, i.e. up to 50% from the maximal number from the final exam.			
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> <b>Final exam</b>
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	1. W. Hoop, W. Lohman, H. Markl, H. Ziegler: Biophysics, Springer-Verlag, 1983
	<b>Additional</b>	
22.2		

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Chemistry</b>		
2.	<b>Code</b>	<b>FVM114</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>First year/winter semester</b>	<b>ECTS credit points</b>	<b>5.0</b>
8.	<b>Teacher</b>	<b>Prof. Zehra Hajrulai-Musliu</b>		
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b>            Gaining theoretical knowledge on general, inorganic and organic chemistry. The students with interactive teaching will be introduced with main principles of fundamentals of chemistry, which is necessary for formation of a modern doctor of veterinary medicine. Knowledge gained with this course will serve as the basis of related disciplines.</p> <p>In general part, the student will be introduced with basic chemical concepts and laws, structure and electronic configuration of atoms, chemical bonds and chemical reactions, chemical balance, their energy change and nuclear reactions. Studying the properties of the most important chemical elements and their compounds based on general principles, electronic configuration and size of the atom.</p> <p>In the second part of the course are presented the contemporary theory of chemical bonds in organic compounds as important mechanisms for some organic reactions.</p> <p>Classification of compounds as aliphatic or acyclic and cyclic. Especially will be described those groups of compounds, which the student will meet during the studies that are of particular relevance to veterinary science. In the individual groups of organic compounds, will be presented more important methods for their derivation, their physical and chemical properties, representatives and their application.</p>			

	<p>The names of the compounds will be given according to IUPAC nomenclature, but also and their trivial names that are still in use.</p> <p>Practical part aims to introduce students with the fundamentals of general, inorganic and organic chemistry, to gain knowledge about the chemical structure of substances, changes and reactions that are important for veterinary medicine (qualitative chemical analysis, quantitative analytical chemistry acidimetric, alkalimeter, iodometry, argentometry, permanganometers, and basic chemical calculation).</p>																										
<b>11.</b>	<p><b>Brief content</b>  <b>Theory classes</b>  Introduction. Structure of the substances. Dispersions. Acids and bases. Reactivity. Introduction in inorganic chemistry. Elements of a-subunit of the seventh, sixth, fifth, fourth and third group of the periodic system. Alkali and alkaline earth metals. Elements of B subunit – metals. Introduction to organic chemistry. Hydrocarbons. Organic compounds containing oxygen. Organic compounds containing nitrogen</p> <p><b>Practicals</b>  Computational exercises (stehiometry). Volumetric analysis. Qualitative analysis. pH and buffers</p>																										
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written assay: learning with use of referent textbooks and internet, preparing written assay (assay/poster); presentation and discussion about the written assay.</p>																										
<b>13.</b>	<b>Total available time</b>	<b>125 hours</b>																									
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)																									
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>																							
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>45 hours</b>																							
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																								
		<b>16.2</b>	<b>Individual tasks</b>																								
		<b>16.3</b>	<b>Self-directed learning</b>	<b>50 hours</b>																							
<b>17.</b>	<b>Method of assessment</b>																										
	Points gained by student's activities:																										
	<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>12</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written assay</td> <td>5</td> <td>10</td> </tr> <tr> <td>Tests (four)</td> <td>10</td> <td>20</td> </tr> <tr> <td>Final exam</td> <td>9</td> <td>25</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	12	15	Attendance and activity (knowledge) on practicals	24	30	Written assay	5	10	Tests (four)	10	20	Final exam	9	25	<b>Total:</b>	<b>60</b>	<b>100</b>		
<i>Type of activity</i>	<i>Points</i>																										
	<i>minimum</i>	<i>maximum</i>																									
Attendance on theory classes	12	15																									
Attendance and activity (knowledge) on practicals	24	30																									
Written assay	5	10																									
Tests (four)	10	20																									
Final exam	9	25																									
<b>Total:</b>	<b>60</b>	<b>100</b>																									
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																							
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																							

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	For being able to pass the final exam student has to gain up to 45 points from theory classes and practicals and the four tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (four):</b> written <b>Knowledge assessment:</b> practical and theoretical exam tests <b>Final exam:</b> oral <b>Complete final exam:</b> oral + written (includes one test)	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
<b>22.1</b>	<ol style="list-style-type: none"> <li>1. T. Poulsen (2010): Introduction to chemistry. CK-12 Foundation</li> <li>2. S.S. Zumdahl, S.A. Zumdahl (2007): Chemistry, Seventh edition, Houghton Mifflin Company Boston New York</li> <li>3. M. S. Silberberg (2000): Chemistry, The Molecular Nature of Matter and Change, McGraw Hill.</li> <li>4. J. G. Smith (2006): Organic chemistry, McGrawHill, New York</li> </ol>		
	<b>Additional</b>		
<b>22.2</b>			

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Biostatistics</b>		
<b>2.</b>	<b>Code</b>	<b>FVM115</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>First year/winter semester</b>	<b>ECTS credit points</b>	<b>2.5</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Zhaneta Popeska, PhD</b> <b>Ass. Prof. Nikola Adamov, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	This course is introduction of statistical methods that are utilized for studying natural sciences. The		

	objective of the course is to enable the students to analyze the biologic and biomedical problems in quantitative manner and thus to provide them with the basic understanding of the principles that are foundation of the statistic science. The world that we live in and which we try to understand is filled with differences and uncertainties. In the natural sciences not rarely the different experimental and observation studies produce large amount of data. The statistics provides us with methods for data organization, presentation and interpretation based on the information that they contain. The biostatistics deals with implementing these statistical methods in the field of natural sciences.					
<b>11.</b>	<b>Brief content</b> <i>Theory classes</i> Introduction to biostatistics. Basic concepts, definitions and terms. descriptive statistics. Quantitative variables. Basic rules about probabilities. Probability distributions for discrete random variables. Probability distributions for continuous random variables. Functions of random variables and sampling distributions. Inductive statistics – estimations of parameters; hypothesis testing. Hypothesis testing for proportions. Relationship between quantitative variables. Analysis of data variance. Testing of qualitative data independence. Time series analysis <i>Practicals</i> Solving tasks related with completed parts of the theory classes.					
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.					
<b>13.</b>	<b>Total available time</b>	<b>60 hours</b>				
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)				
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>		
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>		
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>			
		<b>16.2</b>	<b>Individual tasks</b>			
		<b>16.3</b>	<b>Self-directed learning</b>	<b>15 hours</b>		
<b>17.</b>	<b>Method of assessment</b>					
	Points gained by student's activities:					
			<i>Type of activity</i>		<i>Points</i>	
					<i>minimum</i>	<i>maximum</i>
			Attendance on theory classes		12	15
			Attendance and activity (knowledge) on practicals		12	15
			Written essay		6	10
		Tests (two)		15(x2)=30	30(x2)=60	
		Final exam		not predicted		
		<b>Total:</b>		<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>		
		from 51 to 60 points		<b>6 (six) (E)</b>		

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test.</p> <p>Final exam is not predicted. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.</p>	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> not predicted</p> <p><b>Compete final exam:</b> not predicted</p>	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	Any university biostatistics textbook	
	<b>Additional</b>		
	<b>22.2</b>		

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Histology with embryology</b>		
<b>2.</b>	<b>Code</b>	<b>FVM116</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>First year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>8.5</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Florina Popovska-Perchinikj, PhD</b>		

<b>9.</b>	<b>Preconditions</b>		
<b>10.</b>	<p><b>Program course goals (competencies):</b> Based on previously acquired knowledge from other preclinical disciplines such as: chemistry, biophysics, cell biology, as well as parallel studies of molecular biology, biochemistry, anatomy and physiology, the aim of this course is to explain the microscopic structure of different tissues and organs, linking it to their development, growth and function. Therefore, within this course, students gain knowledge about the overall processes of growth, formation and cellular differentiation during the embryonic development (general embryology) and about the microscopic structure of the four main tissues (general histology). Subsequently, students learn about the organ development, i.e. organogenesis (special embryology) as well as microscopic structure of different organs (special histology). Accordingly, this subject enables better understanding of other courses within the scientific field of functional morphology, but it also represents a good foundation for further studies and better understanding of the pathological changes that may occur in various organs.</p>		
<b>11.</b>	<p><b>Brief content</b> <i>Theory classes</i> Introduction. Microscopic techniques and laboratory methods for tissue preparation and different staining techniques. Main microscopic features of different types of epithelial, connective, muscular and nervous tissue. Microscopic structure of cartilage and bone tissue; Types of ossification; Blood and blood elements. Basic principles of embryology; Gametogenesis; Ovulation. Structure of male and female gametes. Fertilization; Cleavage of fertilized egg and types of cleavage; Gastrulation; IVF; Development of axial organs and mesoderm; Development of the embryonic primitive body; Implantation; Formation of the extraembryonic membranes and placentation; Types of placentas; Tissue development; Head and axillary organs development; Embryogenesis and microscopic structure of the heart and blood vessels. Thoracic cavity. Embryogenesis and microscopic structure of the organs from the lymphatic, endocrine, respiratory, digestive, nervous and urogenital system. Embryogenesis and microscopic structure of skin and its derivatives as well as sensory organs (eye and ear). <i>Practicals</i> Microscopic structure of different types of epithelial, connective, muscular and nervous tissue. Gametogenesis; Fertilization; Cleavage; Gastrulation; Early stages of embryonic development; Techniques of IVF: oocyte aspiration, maturation and cultivation, IVF and embryo development; Extraembryonic membranes and different types of placentas; Microscopic structure of different organs from cardiovascular, lymphatic, endocrine, respiratory, digestive, nervous and urogenital system, skin and its derivatives and sensory organs.</p>		
<b>12.</b>	<p><b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: microscopy practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>		
<b>13.</b>	<b>Total available time</b>	<b>212.5 hours</b>	
<b>14.</b>	<b>Organization of the course</b>	<p>I semester: Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours) II semester: Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)</p>	
<b>15.</b>		<b>15.1</b>	<b>Lectures - theory classes</b> <b>60 hours</b>

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>90 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>62.5 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
	<i>Type of activity</i>			<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
	Attendance on theory classes			<b>6</b>	<b>10</b>
	Attendance and activity (knowledge) on practicals			<b>10</b>	<b>15</b>
	Tests (five)			<b>35(5x7)</b>	<b>75(5x15)</b>
Final exam			<b>not predicted</b>		
Total			<b>51</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		<p>Final exam is not predicted. Students have to pass all five tests (to gain more than 7 points on every test). These points are added to the points gained for attendance and activity on theory classes and practicals.</p> <p>If the student does not pass one or more tests (less than 7 points per test), he/she has to retake these tests at the end of every semester, until obtaining 7 or more points per test.</p> <p>If the student wants to prepare a written essay, he/she can gain up to 5 points for this activity, which will be added on previously collected points. Written essay can be prepared only by students who have passed all five tests.</p>		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (five):</b> written and practical</p> <p>First test: General histology, heart and blood vessels</p> <p>Second test: General embryology</p> <p>Third test: organs of the lymphoreticular, endocrine and respiratory system</p> <p>Fourth test: thoracic cavity, organs of digestive and nervous system</p> <p>Fifth test: urogenital tract, integument and skin derivatives, sensory organs</p>		

22.	<b>Textbooks</b>	
	22.1	<b>Mandatory</b>
		<ol style="list-style-type: none"> <li>1. Don Samuelson (2007): Textbook of veterinary histology</li> <li>2. Dellman's Textbook of Veterinary Histology (1998) ed. Joann Eurell</li> <li>3. William J. Banks (1993): Applied Veterinary Histology</li> <li>4. Drew M. Noden (1985): The embryology of domestic animals</li> <li>5. Junqueira H.C. (2005): Basic histology</li> </ol> <p><i>Practical books and atlases:</i></p> <ol style="list-style-type: none"> <li>1. Linda M. Bacha, William J. Bacha ed.(2000): Color Atlas of Veterinary Histology</li> <li>2. William J. Banks: Histology and comparative organology: a text-atlas</li> <li>3. Horst-Dieter Dellmann: Veterinary histology: an outline text-atlas</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Biochemistry</b>		
2.	<b>Code</b>	<b>FVM117</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>First year/summer semester</b>	<b>ECTS credit points</b>	<b>8.0</b>
8.	<b>Teacher</b>	<b>Prof. Velimir Stojkovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b></p> <p><i>Theory classes</i></p> <p>Biochemistry as a science introduces the students with the basic laws of chemistry and physics, implemented in all systems of a living cell, e.g. introduction to the chemical processes in the living organisms. Students begin with the study of the structure of all bio macromolecules as basic building components of living cells, their interaction and the processes of oxidative degradation (catabolism) and biosynthesis (anabolism) and their importance in biochemistry.</p> <p>The study programme encompasses the transmission and expression of genetic information as an introduction to the description of nucleic acids' structure and their function in replication, transcription and translation. The regulation and interaction of the metabolic processes are covered as well.</p> <p>Biochemistry as a basic subject helps students in gaining knowledge for the structure and function of bio macromolecules and their interactions in physiological and patophysiological conditions.</p> <p>In combination with Cell biology and Genetics, it offers the basic knowledge to study other preclinical and clinical program courses such as microbiology, immunology, pharmacology, pathophysiology etc. The student's theoretical knowledge is checked up with laboratory work and practice.</p> <p><i>Practicals</i></p>			

	<p>During the practical laboratory work, the students get to know with the basic experiences in experimental work with biological matrix, with a special note on the safety during sampling, and protection of the analyst. Students are introduced with the basic analytical biochemical methods important in veterinary medicine (titration, kinetic methods, electrophoresis, different chromatographic techniques, spectrometry, extraction, enzyme-immunological technique, ELISA, PCR) and with laboratory instruments.</p> <p>Students are required to work out short project summarizing their knowledge (isolation and identification of bio macromolecules from tissues and body fluid, such as: immunoglobulin, enzymes, glycogen, lipids, nucleic acids etc). The findings are orally presented and discussed.</p>			
<b>11.</b>	<p><b>Brief content</b>  <b>Theory classes</b>  General topics, methods and techniques in biochemistry. Water and electrolytes. Acid-base homeostasis. Amino acids and peptides. Proteins. Enzymes. Carbohydrates. Lipids. Metabolic interrelations. Nucleic acids. Recombinant DNA and biotechnology. Hormones. Molecular cell biology. Porphyrins and their metabolism. Vitamins, microelements, macroelements and trace elements.  <b>Practicals</b>  Introduction to laboratory analyses. Solutions. Mineral salts. Proteins. Carbohydrates. Lipids. Enzymes. Vitamins. Hormones. Metabolism.</p>			
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
<b>13.</b>	<b>Total available time</b>	<b>200 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 4 hours/per week (60 hours) Practicals: 4 hours/per week (60 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>60 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>80 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
	<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	<b>Attendance on theory classes</b>		<b>6</b>	<b>10</b>
	<b>Attendance on practicals</b>		<b>6</b>	<b>10</b>
	<b>Activity (knowledge) on practicals</b>		<b>6</b>	<b>10</b>
	<b>Written essay</b>		<b>6</b>	<b>10</b>
	<b>Tests (three)</b>		<b>18</b>	<b>30</b>
<b>Final exam</b>		<b>18</b>	<b>30</b>	
<b>Total:</b>		<b>60</b>	<b>100</b>	

18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
	from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	<ul style="list-style-type: none"> <li>- Attendance on the teaching is not scored if student was absent on more than 20% of lessons;</li> <li>- Student who has gained up to 6 points from activity on practicals is liberated from passing practical exam;</li> <li>- Student can pass final exam only with passed practical exam, prepared written assay and up to 42 points gained on any mode;</li> <li>- Student is liberated from passing final exam with passed practical exam, prepared written assay, results shown on three tests and minimum 61 points gained on any mode.</li> </ul> Condition for reaching final exam: passed exam of course Chemistry.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (three):</b> written <i>First test:</i> General topics, methods and techniques in biochemistry. Water and electrolytes. Acid-base homeostasis. Amino acids and peptides. <i>Second test:</i> Proteins. Enzymes. Carbohydrates. Lipids. Metabolic interrelations. <i>Third test:</i> Nucleic acids. Recombinant DNA and biotechnology. Hormones. Molecular cell biology. Porphyrins and their metabolism. Vitamins, microelements, macro elements and trace elements. <b>Final exam:</b> oral	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>1. Devlin, T. (1997): Textbook of biochemistry with clinical correlations, 4<sup>th</sup> ed. John Wiley &amp; Sons inc. Pub. New York</li> <li>2. Stryer (1993): Biochemistry, 4<sup>th</sup> ed. W.H. Freeman &amp; co. New York.</li> <li>3. Lehninger, A.L., Nelson, D.L. and Cox, M.M. (2000) Principles of Biochemistry, 3<sup>rd</sup> ed. Worth Publishers. New York, 2000.</li> </ol>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Nutritious, healing and poisonous plants		
2.	Code	FVM118		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	First year/summer semester	ECTS credit points	3.0
8.	Teachers	Prof. Risto Prodanov, PhD Prof. Romel Velev, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b> The main goal of the course <i>Nutritious, healing and poisonous plants</i> is to introduce students with the role and significance of vegetation for domestic animals. In the case will study the flora of view of veterinary science, i.e. students to be acquainted with the most important nutritious, healing and poisonous plants. With this course students are allowed to know plants not in botanical sequence and classification, but in their practical importance for domestic animals.</p>			
11.	<p><b>Brief content</b> <b>Theory classes</b> General section: Introduction, relation of the course Nutritious, healing and poisonous plants with courses Nutrition of domestic animals, Pharmacology, Veterinary toxicology, Internal diseases of farm animals and Biology and pathology of bees. Flora as the main energy sources of food in nature. Chemical composition of food of herbal origin. Morphology and physiology of herbal organs. Environmental factors and flora. Taxonomy and general characteristic of plants used for animal nutrition. Production of feed on meadows, pastures and cultivated terrains. Special section: Meaning of bacteria, molds and algae. Grasses (<i>Poaceae</i>). Legumes (<i>Fabaceae</i>). Roots, tuberous and other food plants. Healing plants. Honey pasture plants and bee pasture. Toxic plants. <b>Practicals</b> Studying and recognition of sweet grasses – cereals, meadow and grasses on fields for grazing (from I, II and III class); legumes; root-tuberous other important crop for domestic animals; toxic and healing plants. The practical importance of the chemical composition of plants for domestic animals. Herbal production of animal feed. Crop production and environmental factors. Flora and bee pasture.</p>			
12.	<p><b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
13.	Total available time	75 hours		
14.	Organization of the course	Theory classes: 1 hour per week (15 hours) Practicals: 2 hours per week (30 hours)		
15.		15.1	Lectures - theory classes	15 hours

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>30 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	12	15
		Attendance and activity (knowledge) on practicals	12	15
		Written assay	6	10
	Tests (two)	15(x2)=30	30(x2)=60	
	Final exam	not predicted		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of periodical evaluations during the semester with up to 25% points gained per evaluation. Final exam is not predicted. Student who did not pass one of the periodical evaluations during the semester goes to one of the periodical evaluation during the exam sessions.</p>		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final evaluation.</p> <p><b>Tests (two):</b> written  First test: general section  Second test: special section</p> <p><b>Final exam:</b> not predicted  <b>Complete final exam:</b> not predicted</p>		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		

		<p>1. Postlethwait J.H., Hopson J.L.: The Nature of Life. Mc Graw-Hill Publishing company, 1989.</p> <p>2. Bruneton J.: Pharmacognosy, Phytochemistry, Medicinal Plants. Lavoiser Publishing, Paris 2<sup>nd</sup> ed. , 1998.</p> <p>3. Extracts from referent textbooks and Internet</p> <p>4. Course materials (lecture handouts and notes) will be provided for every students (LMS)</p>
	<b>22.2</b>	<b>Additional</b>

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Ethology and animal welfare</b>		
<b>2.</b>	<b>Code</b>	<b>FVM119</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Third year/summer semester</b>	<b>ECTS credit points</b>	<b>3.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Vlatko Ilieski, PhD</b> <b>Prof. Lazo Pendovski, PhD</b>		
<b>9.</b>	<b>Preconditions</b>	Completed all courses from I to V semester. Realized Extra mural practice in II year.		
<b>10.</b>	<b>Program course goals (competencies):</b>	<p>The students will be introduced with different welfare concepts, to understand differences between negative/bad welfare (i.e. suffering) and positive/good welfare (i.e. wellbeing). Also, they will learn why animals can feel pain and suffering, and also to express positive emotions, as joy and pleasure. The students will gain knowledge how the real animal welfare status can be assessed in context of organism's biologic functions; how animals experience their life in relation with their physical functioning, mental condition/feelings and their natural environment. The students will be introduced with five freedoms principles, three-P concept and life quality concept. They will be able to understand animal social status assessment process, problem identification with society protection and corrective measures promotion. Also they will obtain explanation of parameters for animal welfare status assessment: physiological parameters, behavioral parameters, and protection measures in animal production in aspect of animal welfare. The physiological parameters will be studied as result of sensor input response: stress response, immune response, neurobiological response, and metabolic responses. Relation between welfare and physiology response will also be explained. The behavioral parameters will be studied as an indicator for: is the animal good functioning (normal), is it feeling good; and behavior which suggests that some animal DOES NOT function good (abnormal), it is not feeling good. Behavioral categories: physical (including functioning), mental (including feelings) and aspects of species naturality. Parameters related with animal production and diseases will be also elaborated. The production has impact on welfare, there for it causes pain, exosting, and impaired physical functioning. Study matter in this course is also: pain as important aspect of disease, with explanation of pain mechanism; genetics as factor related with production and welfare. Also, welfare indicators which include resources, as well as technical practices for handling with animals are studied</p>		

	in this course. Finally, the course includes: welfare assessment techniques (welfare assessment protocols - Welfare quality, AWIN etc.); animal welfare assessment in practice; animal welfare in aspect of producers, industry, consumers and society in total; ethical theories on use of animals; professional ethics and communication with clients; animal welfare legal framework in EU.			
<b>11.</b>	<p><b>Brief content</b></p> <p><b>Theory classes</b> Animal welfare definition. Indicators for animal behavior. Correlation between human and animals and animal welfare. Morphological parameters of animal welfare. Physiological indicators of animal welfare. Production parameters in relation to animal welfare. Neurobiology and animal welfare. Pain in animals. Animal welfare and suffering. Ethical approach to animals. Welfare of farm animals. Animal welfare during slaughtering. Standards of animal welfare and their assessment. Animal welfare legislation. Economy and animal welfare.</p> <p><b>Practicals</b> Animal welfare standards and their assessment. Indicators for animal behavior. Assessment of animal's pain. Practical assessment of behavior and welfare of companion animals. Practical assessment of behavior and welfare of equines. Practical assessment of behavior and welfare of farm animals. Practical assessment of behavior and welfare of poultry. Practical assessment of behavior and welfare of swine. Practical assessment of behavior and welfare of laboratory animals. Practical assessment of behavior and welfare of exotic animals. Assessment of animal welfare during slaughtering.</p>			
<b>12.</b>	<p><b>Methods of studying</b></p> <p>Theory classes: interactive (lectures in large group with discussion and active participation of the students).</p> <p>Practicals: practicals and other ways of work with smaller groups</p> <p>Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
<b>13.</b>	<b>Total available time</b>	<b>75 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>45 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on theory classes</b>	<b>12</b>	<b>15</b>
		<b>Attendance and activity (knowledge) on practicals</b>	<b>12</b>	<b>15</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>Tests (two)</b>	<b>1 (x2)=30</b>	<b>30(x2)=60</b>	
	<b>Final exam</b>	<b>not predicted</b>		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	

		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test.</p> <p>Final exam is not predicted. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.</p>	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> not predicted</p> <p><b>Complete final exam:</b> not predicted</p>	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>1. Temple Grandin. Animal welfare improvement, CAB International, 2010</li> <li>2. D.M. Broom, K.J. Johnson. Stress and animal welfare, Cluver Academic Publishers, 1993</li> </ol>	
	<b>22.2</b>	<b>Additional</b>	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Health and sport</b>		
<b>2.</b>	<b>Code</b>	<b>FVM120</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>First year/summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Senior Lect. Suzana Simeva, MSc</b>		

		<b>Senior Lect. Branko Kstevski, PhD (head)</b> <b>Prof. Slavica Novachevska, PhD</b> <b>Senior Lect. Sasho Todorovski, PhD</b> <b>Senior Lect. Risto Stamenov, PhD</b> <b>Senior Lect. Jana K. Dimitrovska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> The goal of course Health and sport is to adopt new and improve previous gained motoric skills, improvement of personal motoric and functional capacities in direction of health improving, fulfilling of physical activity needs, empowerment of the student for rational, expedient use of his/her free time, improving of quality of life in young, middle and old age, as well as improvement of the social communication. <b>Expected results:</b> Empowering the student for individual sport activity and physical exercises, introducing with fundamentals of the physical culture and healthy nutrition. Gaining knowledge about the structure, rules and principles of the training process and specificities of the chosen training activity.			
<b>11.</b>	<b>Brief content</b> <b>A. Program – general regular program</b> - basketball, futsal, volleyball, handball, dance fitness programs (aerobic, step-aerobic, pilates etc.) <b>B. Program – elective teaching</b> - mountaineering and camping, swimming, biking, rolling, skating, skiing, table-tennis <b>C. Program – program for students with invalidity</b> - physical activities depending of student’s diagnosis <b>D. Elective programs for students from higher study years</b> <b>E. Program – sport competitions</b>			
<b>12.</b>	<b>Methods of studying</b> Method of live speech, method of demonstraion, method of practical exercise (synthetical, analytical, complex), method of sport training.			
<b>13.</b>	<b>Total available time</b>	<b>30 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	30 hours		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>26 hours</b>
		<b>15.2</b>	<b>Practical exercises (frontal, individual, side, circular)</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Diagnosing of individual motoric capabilities (with standard MAKFIT motoric tests)</b>	<b>4 hours</b>
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Tests Written assay/project (presentation) oral or written Activity and participation			

18.	Grading criteria (points/grade)	The course is not graded
19.	Requirement for signature and taking the final exam	Minimum 60% attendance of teaching program, and active participation in realization of teaching activities included in the course.
20.	Teaching language	English
21.	Method of monitoring the quality of teaching process	Adspection method, testing method etc.
22.	Textbooks	
	Mandatory	
22.1	List of textbooks is obtained by the course teacher depending of student's choice of kinesiological activity.	
	Additional	
22.2		

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Physiology of animals		
2.	Code	FVM211		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/winter, summer semester	ECTS credit points	13.7
8.	Teacher	Prof. Vladimir Petkov, PhD		
9.	Preconditions	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<b>Program course goals (competencies):</b> <i>Theory classes:</i> Basic aim of the course Physiology of animals is studying of normal functions of the cell, organs, organic systems in healthy organisms. Physiology is studying life processes and relations between internal conditions within the organism and environmental conditions. The animal physiology takes an important place in the veterinary medicine curriculum. Students which			



15.	Forms of teaching activities	15.1	Lectures - theory classes	105 hours	
		15.2	Practicals (laboratory, auditorial), seminars, team work	105 hours	
16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	132.5 hours	
17.	Method of assessment				
	Points gained by student's activities:				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			Attendance and activity on theory classes	12	15
			Attendance and activity (knowledge) on practicals	12	15
			Tests (two) of practicals	10	20
		Final exam			
		Total:	60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)	
			from 51 to 60 points	6 (six) (E)	
			from 61 to 70 points	7 (seven) (D)	
			from 71 to 80 points	8 (eight) (C)	
			from 81 to 90 points	9 (nine) (B)	
			from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam		For being able to reach the final exam student has to pass the two tests from practicals. Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals and Histology with embryology.		
20.	Teaching language		English		
21.	Method of monitoring the quality of teaching process		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests:</b> written <b>Complete final exam:</b> oral		
22.	Textbooks				
	22.1	Mandatory			
		<ol style="list-style-type: none"> <li>Cunningham, J. G., and Klein, G. K. <i>Cunningham's Textbook of Veterinary Physiology (fourth edition)</i>. Elsevier, 2007.</li> <li>Cunningham, J. G., and Klein, G. K. <i>Cunningham's Textbook of Veterinary Physiology (fifth edition)</i>. Elsevier, 2013.</li> <li>Rastogi, S. C. <i>Essentials of Animal Physiology (Fourth Edition)</i>. New Age International (P) Ltd., Publishers, 2007</li> <li>Frandsen, R. D., Lee Wilke, W., Dee Falls, A. <i>Anatomy and Physiology of Farm Animals (Seventh Edition)</i>. Wiley-Blackwell, 2009</li> </ol>			
22.2	Additional				


Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Nutrition of domestic animals		
2.	Code	FVM212		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/winter, summer semester	ECTS credit points	8.8
8.	Teacher	Prof. Risto Prodanov, PhD		
9.	Preconditions	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<p><b>Program course goals (competencies):</b>  <i>Theory classes</i> from the course Nutrition of domestic animals has the goal to introduce the students with the common properties of plants and other nutrients which are used as food for animals, their nutritional value, their directional properties, biological value etc. The study of the needs of the animals for nutritional and biological active compounds, their influence on sustaining basal physiological functions and production (production of meat, milk, eggs, wool, workforce etc.), as well as the satisfying the needs of the animal in simpler, more rational, i.e. more economical way.  In order to accomplish this goal the students will be using the knowledge from other science disciplines, such as: chemistry, biochemistry, physics, physiology, microbiology, botanic, pedology, pathology, economics etc.  <i>Practicals</i> have the goals to introduce the students with: sampling techniques, analytical methods for chemical composition of feed, starch equivalent, measuring units; introduction of feed; evaluation of feed hygiene; completing a meal for different species and categories of animals; analysis and correction of meals. <i>Field practice</i> – visit of feed production premise.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  General part: Introduction. Basic nutrients. Nutritional value of feed. Feed. Feed preservation. Cereal feed. Byproducts. Animal feed. Minerals. Additives. Feed mixing and preparation of feed. Antinutritive material. Basic needs of animals.  Special part:  Nutrition of cattle. Nutrition of sheep and goats. Nutrition of pigs. Nutrition of equines. Nutrition of poultry. Nutrition of carnivores. Nutrition of laboratory animals. Nutrition of fish.  <b>Practicals</b>  Sampling. Determination of chemical composition of feed. Starch equivalent. Introduction of feed. Hygienic assessment of feed. Making meals for various types and categories of animals. Analysis and correction of meals. Visit of mixer for production of feed and visit of facilities in order to demonstrate the feeding of cattle, pigs and poultry.</p>			
12.	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).</p>			

	Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>220 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	III semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) IV semester Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>85 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	12	15
		Attendance and activity on practicals	12	15
		Written essay	6	10
		Tests (three)	30	60
		Final exam		
		<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	For being able to reach the final exam student has to gain up to 50 points from theory classes and practicals and the three tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (three):</b> written  First test: general part  Second and third test: special part</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral + written (includes one test)</p>
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
22.1	<ol style="list-style-type: none"> <li>1. Animal Feeding and Nutrition 11th Edition, Jurgens Marshall H, Bregendahl Kristjan, Coverdale Jozie, Hansen Stephanie L</li> <li>2. Applied Animal Nutrition: Feeds and Feeding (3rd Edition) 3rd Edition, Peter R. Cheeke</li> <li>3. Livestock Feeds and Feeding (6th Edition) 6th Edition, Richard O. Kellems, David C. Church</li> <li>4. Animal Nutrition Science, G Dryden</li> </ol>	
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Animal husbandry</b>		
2.	<b>Code</b>	<b>FVM213</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Second year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>8.8</b>
8.	<b>Teacher</b>	<b>Ass. Prof. Nikola Adamov, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<b>Program course goals (competencies):</b>	<p>The <i>theory classes</i> of the course Animal husbandry are intended to make the students familiar with the theoretical basics and with the principles and methods for improving the main stock breeding areas such as cattle, sheep, goat, pig, poultry and horse production and management. Within these separate animal science areas, the students will be introduced with the most important biological, productive and reproductive features of the different types and breeds of domestic animals, the technology for their raising, their products and the measures for their improvement. In this way the future doctors of veterinary medicine will become familiar with the most important factors that determine the succesfulness of raising certain stock type which are specific to different farm animal species and thus making them capable in future to implement their knowledge in practical conditions.</p> <p>The objective of the <i>practicals</i> of the course Animal husbandry is to introduce the students with the</p>		

	<p>principles and methods that are used for solving specific problems in animal production systems as well as with the most important breeds and types of farm animals, the purpose of their rearing, their exterior appearance, genotype, the different possibilities for their raising and the measures for improvement of the production. As part of this training several field trips to different animal farms are included with purpose to enable the students to better understand the technological solutions for housing and raising different farm animal species which are the most important factors for maintaining the animal health thus making them most important factors that determine the successfulness of every livestock production system.</p>	
<b>11.</b>	<p><b>Brief content</b>  <b>Theory classes</b>  <i>Cattle farming</i>: Economic significance and origin of the cattle. Bovidae species relatives of true cattle Breeds and genotypes of cattle. Cattle reproduction and calf rearing technology. Milk and meat production. Possibilities for cattle genetic improvement. Cattle breeding methods. <i>Sheep farming</i>: Economic significance and origin of the sheep. Breeds of sheep. Sheep reproduction. Sheep selection and genetic improvement. Breeding methods. Sheep milk, meat and wool production. <i>Goat farming</i>: Economic importance and origin of the goat. Goat breeds. Goat reproduction. Goat selection and breeding. Breeding methods. <i>Pig farming</i>: Economic importance and origin of the domestic pig. Breeds and types of pigs. Pig reproduction. Selection in pig production. Pig breeding methods. Technological solutions in farm pig production. <i>Poultry farming</i>: Economic importance and origin of poultry. Chicken breeds and hybrids. Turkey breeds and hybrids. Breeds of domesticated guinea fowl, geese and ducks. Chicken egg and broiler meat production. Selection in poultry production. <i>Equine farming and management</i>: Origin and evolution of the horse. Breeds of horses. Equine species. Exterior scoring. Horse breeding methods. Horse utilization and housing.</p> <p><b>Practicals</b>  Approach, handling and fixation of domestic animals. Exterior assessment of the domestic animals. Instruments for exterior evaluation and body measures. Assessment of the quality of the wool and the hide. Assessment of the body condition and its scoring. Exterior and production types of domestic animals. Animal identification. Assessment of the age of domestic animals. Herd book recording in animal production. Scoring and licensing of breeding animals. Economic importance and origin of the cattle. True cattle and their closely related species. Breeds of cattle. Cattle reproduction and rearing newborn calves. Cattle milk and meat production. Possibilities for genetic improvement of dairy cattle. Cattle breeding methods. Economic importance and origin of the sheep. Breeds of sheep. Sheep reproduction. Sheep selection and breeding. Sheep breeding methods. Sheep milk, meat and wool production. Economic importance and origin of goats. Goat breeds. Goat reproduction. Selection methods in goat production. Goat breeding strategies. Economic importance and origin of the domestic pig. Breeds of pigs. Pig reproduction and artificial insemination. Selection of breeding boars and gilts. Pig breeding methods. Technological phases in intensive pig production system. Economic importance and origin of the poultry. Chicken breeds and hybrids. Domestic turkey breeds and hybrids. Domesticated guinea fowl, geese and ducks. Chicken egg and broiler meat production. Selection in poultry production. Origin and evolutionary stages of the domestic horse. Breeds of horses. Equine species relatives of the domestic horse. Horse exterior scoring. Horse breeding methods. Facilities and equipment for rearing horses. Horse utilization and housing.</p>	
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written essay: learning with use of referent literature and internet, preparing written essay; presentation and discussion about the written essay.</p>	
<b>13.</b>	<b>Total available time</b>	<b>220 hours</b>
<b>14.</b>	<b>Organization of the course</b>	III semester

			Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) IV semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)	
15.	Forms of teaching activities	15.1	Lectures - theory classes	60 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	60 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	100 hours
17.	Method of assessment			
	Points gained by student's activities:			
		Type of activity	Points	
			minimum	maximum
		Attendance on theory classes	12	15
		Attendance and activity on practicals	12	15
		Written essay	6	10
		First test	0	10
		Second test	0	10
		Third test	0	10
	Fourth test	0	10	
	Final exam	0	20	
	Total:	30	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)
			from 51 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)
			from 71 to 80 points	8 (eight) (C)
			from 81 to 90 points	9 (nine) (B)
			from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam		Condition for course teacher's signature at the end of the semester is minimum attendance on 12 hours theory classes and practicals, respectively. Condition for reaching final exam: passed exam of courses Biostatistics and Cell biology.	
20.	Teaching language		English	

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (four):</b> written First test: Cattle farming Second test: Sheep and goat farming Third test: Pig farming Fourth periodical evaluation: Poultry and equine farming <b>Final exam:</b> oral
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
22.1		1) C.J.C. Phillips. Principles of Cattle Production. CABI Publishing, 2001. 2) Carlos A. Risco and Pedro Melendez. Dairy Production Medicine. John Wiley & Sons Inc., 2011. 3) A.H. Andrews, R.W. Blowey, H. Boyd & R.G. Eddy. Bovine Medicine, Diseases and Husbandry of Cattle. Blackwell Science Ltd., 2004. 4) Kor Oldenbroek & Liesbeth van der Waaij. Textbook Animal Breeding and Genetics for BSc students. Centre for Genetic Resources The Netherlands and Animal Breeding and Genomics Centre, 2015. 5) Peter Cockroft. Bovine Medicine (third edition). Wiley Blackwell, 2015. 6) Philip R. Scott. Sheep Medicine. Manson Publishing Ltd., 2007. 7) R. Fries & A. Ruvinski. The Genetics of Cattle. CABI Publishing, 1999. 8) I. Fayez M. Marai & J.B.Owen. New Techiques in Sheep Production. Butterworth & Co. (Publishers) Ltd., 1987. 9) Donald D. Bell & William D. Weaver, Jr. Commercial Chicken Meat and Egg Production (fifth edition). Springer Science+Business Media New York, 2002
22.2	<b>Additional</b>	
		1) S. Leeson and J.D. Summers (2009): Broiler Breeder Production. Nottingham University Press. 2) D. L. Hartl and A. G. Clark (1997): Principles of Population Genetics (third edition). Sinauer Associates, Inc. 3) C.J.C. Phillips (2001): Principles of Cattle Production. CABI Publishing. 4) W.S. Klug, M.R. Cummings, C.A. Spencer (2006): Concepts of Genetics, eight edition. Pearson Education, Inc.

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Animal hygiene</b>		
2.	<b>Code</b>	<b>FVM214</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Second year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>7.9</b>
8.	<b>Teacher</b>	<b>Prof. Aleksandar Dodovski, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<b>Program course goals (competencies):</b> <b>Theory classes</b> The main purpose of the Animal hygiene course is gaining knowledge for environmental influence and hygienic conditions on health and production capacities of animals. The students, at this course, will gain appropriate approach in the reducing of production, abnormal behavior and animal diseases in			

	<p>their complex interactions with the surroundings (environment) and also will create favorable hygienic conditions for the animals to feel comfortable and throughout their breeding and exploitation, maintaining health on highest level, with maximum possible levels of production and reproduction. Within this subject's framework, also attention would be paid on sanitation and diseases prevention during the animal breeding process, so the future doctors of veterinary medicine would be competent for complete implementation, surveillance and control of the measures for biosecurity, disinfection, desinsection and deratization in animal's housing facilities.</p> <p><b>Practicals</b> Introducing students with practical aspects of animal husbandry microclimate conditions examination and assessment. Environment and animal interaction, heat balance and ventilation in the facilities. Hygienic assessment of soil, water and technical - technological standards for different domestic animal's species. In the second part of the practical lectures particular attention would be dedicated to biosecurity measures and HACCP standards on domestic animals farms, as well as practical application of hygienic and sanitary measures (disinfection, desinsection and deratization) in animal husbandry, animal industry and diseases prevention.</p>
11.	<p><b>Brief content</b> <b>Theory classes</b> Hygiene of the air. Hygiene of the soil. Hydrological – pedological relations in hygiene. Water supplying and water hygiene. Organism and environment relation. Feed and feeding hygiene. Hygienic assessment of feeds. Pasture hygiene and pasturing. General hygiene and technological principles in building of animal husbandry facilities. Cattle housing, breeding and exploitation hygiene. Horse housing and breeding hygiene. Swine housing and breeding hygiene. Sheep housing and breeding hygiene. Goat housing and breeding hygiene. Poultry housing and breeding hygiene. Rabbits breeding hygiene. Milking hygiene and prevention of mammary diseases. Hygiene in rearing of young animals. Hygiene in working animals. Hygiene of domestic animals transport. Hygiene of animal body. Hygienic- sanitary and preventive measures in animal husbandry. Disinfection. Desinsection. Deratization. Deodorization. Application of chemical compounds for DDD and environmental protection.</p> <p><b>Practicals</b> Relations between animals and environment. Effects and determining of physical properties of air (temperature, moisture, air movement, pressure and noise). Effects and determining of chemical content of air. Effects and determining of dust in the air. Effects and determining of microorganisms in the air. Types, methods and principals of ventilation. Ventilation for certain species of domestic animals. Determining of sun radiation and light in objects. Heat balance of domestic animals. Heat balance of domestic animals facilities. Soil influence on domestic animals and environment. Determining certain properties of soil (sampling, physical and chemical properties of soil). Determining certain properties of water (bacteriological examination, hygienic assessment and water chlorination). Water influence on domestic animals and environment. Practical aspects of domestic animals watering. Determining some water properties. Practical hygienic aspects for common animal species. Biosecurity principles. Biosecurity measures – practical examples. Disinfection – mechanism, types and stages. Disinfection methods. Applied disinfection. Desinsection – common parasites and pests. Desinsection – types and methods. Integrated pest management – insects. Biological-morphological characteristics of rodents. Deratization methods. Integrated pest management – rodents Equipment and protection during DDD.</p>
12.	<p><b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion, student presentations and their further activating) Practicals: practicals and other ways of work with smaller groups, field visitations, home works and presentations</p>

	Written essay: learning with use of referent textbooks and internet, preparing written essay); presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>197.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	III semester Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours) IV semester Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>45 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>77.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on theory classes</b>	10	12
		<b>Attendance on practicals</b>	7	9
		<b>Activity on theory classes</b>	0	3
		<b>Activity on practicals</b>	2	6
		<b>Written essay</b>	6	10
		<b>Tests (theoretic part) 2 (1+1)</b>	2x6 (12)	2x10 (20)
		<b>Tests (practical part) 2 (1+1)</b>	2x6(12)	2x10 (20)
	<b>Final exam</b>	11	20	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>Student has to gain up to 6 points (60%) from every test to gain confirmation that the such test is passed and this points to be included in the course's total point score.</p> <p>Right to reach final exam has a student who has got signature and has passed all tests.</p> <p>Student who during the semester has gained up to 60 points on any mode and if is satisfied with this result, he/she has right to choose to skip passing of final exam, and if he/she is not satisfied with the result, such student with the final exam can gain higher grade mark for this course.</p>		

20.	Teaching language	English
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final gaining.</p> <p><b>Tests (two):</b> written</p> <p>First test (theoretical part): fundamentals of hygiene and ecology, microclimate conditions in domestic animal facilities, hygienic-technical principles in building of facilities in animal husbandry</p> <p>First test (practical part): microclimate conditions in domestic animal facilities, regulation of microclimate conditions, hygienic assessment of soil and water quality</p> <p>Second test (theoretical part): hygiene and sanitation in animal husbandry</p> <p>Second test (practical part): biosecurity and practical aspects of disinfection, desinsection and deratization</p> <p><b>Final exam:</b> written or oral</p> <p><b>Complete final exam:</b> written or oral (includes one or two tests)</p>
22.	Textbooks	
	Mandatory	
22.1	<ol style="list-style-type: none"> <li>1. Livestock Housing . Modern management to ensure optimal health and welfare of farm animals. A. Aland and T. Banhazi. Wageningen Academic Publishers, 2013</li> <li>2. Livestock Housing. CM. Wathes and D.R. Charles, CAB International 1994</li> <li>3. Handbook of Livestock Management, 4th Edition. R. A. Battaglia, University of Idaho 2007</li> </ol>	
22.2	Additional	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Microbiology		
2.	Code	FVM215		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/winter, summer semester	ECTS credit points	9.6
8.	Teacher	Prof. Slavcho Mrenoshki, PhD Ass. Prof. Iskra Cvetkovikj, PhD		
9.	Preconditions	Completed all courses from I and II semester. Realized extra mural practice in I year.		

<p><b>10.</b></p>	<p><b>Program course goals (competencies):</b>  <i>The theory classes</i> of this course cover the basic principles of veterinary microbiology as well as the genetics from microbiological aspects. The course consists of several thematic fields.  In the first one (virology and prions), studied in the third semester, the students will acquire general knowledge of the viruses as a structure, replication, interaction with the host cell, virulence etc., and will study the most important animal viruses divided by families and diseases that they cause. This part also covers the microbial genetics as well as practical application of genetic engineering. At the end, the basic principles of prion biology as well as the most important prion diseases are studied.  In the second thematic field (bacteriology and mycology), studied in the fourth semester, the students will gain general knowledge of the bacteria which include structure, multiplication, nutrition and metabolism etc., as well as the most important bacteria from veterinary and zoonotic aspect and the diseases which they cause. In the second part of the lectures in this semester, the students will learn about the general properties of fungi and the most important diseases that they cause.  After this course, the future Doctor of Veterinary Medicine will gain the basic knowledge of the pathogenic microorganisms, which is a necessary as a precondition for the future studies where the microbes will be studied through the diseases that they cause in domestic and wild animals. Also, with acquiring of the basics for microbe genetics and genetic engineering, students will obtain knowledge about usage of microbes in this interesting and increasingly utilized segment of the science.  <i>The practicals</i> are also divided in two fields which arise from the previously mentioned.  The laboratory practicals in the third semester are aimed to train the students with basic laboratory techniques for detection and diagnosis of viruses and prions, as well as the principles of diagnostics of the most important viral and prion diseases in particular animal species including field and laboratory aspects.  The laboratory practicals in the fourth semester are aimed to train the students with basic laboratory techniques for detection and diagnosis of bacteria and fungi as, and the principles of diagnostics of the most important bacterial and fungal diseases in particular animal species including field and laboratory aspects.</p>
<p><b>11.</b></p>	<p><b>Brief content</b>  <i>Theory classes</i>  <i>Basic virology, genetics and genetic engineering:</i> Structure and composition of viruses. Classification and nomenclature. Replication of viruses. Genetics. Genetic engineering. Genetics and evolution of viruses. Interaction virus-cell. Mechanisms of infection and viral spread in the organism. Determinants of viral virulence and resistance/ susceptibility of the host organism. Pathogenesis of viral diseases. Viral oncogenesis (short overview of the most important oncogenic viruses). Prevention and control of viral diseases, vaccines and antiviral drugs. Poxviridae. Asfaviridae and iridoviridae. Adenoviridae. Herpesviridae. Papillomaviridae. Hepadnaviridae. Parvoviridae. Reoviridae. Birnaviridae. Retroviridae. Paramyxoviridae. Bornaviridae. Filoviridae. Rhabdoviridae. Bunyaviridae. Arenaviridae. Ortomyxoviridae. Coronaviridae. Arteriviridae. Picornaviridae. Caliciviridae. Flaviviridae. Astroviridae. Togaviridae. Viruses in bees. Prions. Spongiform encephalopathies. <i>Basic bacteriology:</i> Morphology and classification of bacteria. Bacterial nutrition, growth, ecology and metabolism. Sterilization and disinfection Antimicrobial chemotherapy. Interaction microorganism – animal. Bacterial genetics. <i>Special bacteriology:</i> <i>Borrelia. Treponema. Brachyspira. Leptospira. Helicobacter. Campylobacter. Lawsonia. Bartonella. Brucella. Neisseria. Bordetella. Taylorella. Dichelobacter. Francisella. Moraxella. Pseudomonas. Burkholderia. Aeromonas. Salmonella. Proteus. Escherichia. Yersinia. Bacteroides. Fusobacterium. Pasteurella. Mannheimia. Haemophilus. Actinobacillus. Riemeirella. Staphylococcus. Streptococcus. Micrococcus. Bacillus. Paenibacillus. Clostridium. Lactobacillus. Listeria. Erysipelotrix. Actynomices. Actinobaculum. Arcanobacterium. Dermatophilus. Rhodococcus. Nocardia. Corynebacterium. Mycobacterium. Mycoplasma. Rickettsiales. Coxiella. Ordo Chlamydiales. Mycology:</i> General mycology. <i>Candida albicans. Cryptococcus neoformans. Malassezia pachydermatis. Aspergillus. Penicillium. Dermatophytes</i></p>

<p>(<i>Microsporium. Trichopyton</i>). <i>Coccidioides immitis/posadasii. Histoplasma capsulatum. Blastomyces dermatitidis. Sporothrix schenckii</i>. Mycotoxines and mycotoxicoses.</p> <p><b>Practicals</b></p> <p><i>Basic laboratory methods in virology:</i> Introduction in laboratory diagnosis of viruses. Laboratory biosecurity. Collection, packing and transport of samples for virology testing. Receiving of samples in the laboratory. Direct identification of viruses (electron microscopes, immunoelectron microscope). Direct identification of viral antigens (immunofluorescence, immunohistochemistry-immunoperoxidase, ELISA, immunodifusion). Direct identification of viral nucleic acid (hybridization methods – dot blot technique, In situ hybridization, southern blot hybridization, PCR). Isolation of viruses (cell culture, embryonated chicken eggs, laboratory animals). Quantification of viruses. Interpretation of virology laboratory results. Detection of viral antibodies – serological diagnosis (processing of sera for serology, ELISA, serum neutralization test, immunoblot, indirect immunofluorescence, inhibition of hemagglutination, immunodifusion). Interpretation of virology laboratory results. <i>Diagnosis of viral diseases by animal species and diagnosis of prion diseases:</i> Diagnosis of viral diseases in cattle. Diagnosis of viral diseases in sheep and goats. Diagnosis of viral diseases in pigs. Diagnosis of viral diseases in equines. Diagnosis of viral diseases in dogs and cats. Diagnosis of viral diseases in poultry. Laboratory diagnosis of prion diseases. <i>Basic laboratory methods in bacteriology:</i> Introduction in laboratory diagnosis of bacteria and fungi. Laboratory biosecurity. Collection, packing and transport of samples for bacteriology testing. Acceptance of samples in the laboratory. Practical aspects of sterilization. Microscopy of bacteria. Isolation of bacteria. Biochemical assessment of bacteria. Biological experiment. Typing by antimicrobial resistance/susceptibility. Antibiotic susceptibility test. Practical application of serological and molecular methods in diagnosis of bacterial infections. Mastitis. <i>Diagnosis of bacterial and fungal diseases by animal species:</i> Diagnosis of fungal diseases and mycotoxicoses. Diagnosis of bacterial and fungal diseases in cattle. Diagnosis of bacterial and fungal diseases in sheep and goats. Diagnosis of bacterial and fungal diseases in pigs. Diagnosis of bacterial and fungal diseases in equines. Diagnosis of bacterial and fungal diseases in dogs. Diagnosis of bacterial and fungal diseases in cats. Diagnosis of bacterial and fungal diseases in poultry.</p>				
<b>12.</b>	<b>Methods of studying</b>			
	Theory classes: interactive (lectures in large group with discussion and active participation of the students).			
	Practicals: practicals and other ways of work with smaller groups			
<b>13.</b>	<b>Total available time</b>	<b>225 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	III semester		
		Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
		IV semester		
		Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	

		<b>16.3</b>	<b>Self-directed learning</b>	<b>90 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b> Attendance on every lecture i.e. practical takes 0.5 points.				
	<i>Type of activity</i>		<i>Points</i>		
			<i>minimum</i>	<i>maximum</i>	
	<b>Attendance on theory classes</b>		7.5	<b>15</b>	
	<b>Attendance on practicals</b>		7.5	<b>15</b>	
	<b>Tests – theory classes (four)</b>		15	<b>30</b>	
	<b>Tests – practicals (four)</b>		10	<b>20</b>	
	<b>Final exam</b>		11	<b>20</b>	
	<b>Total:</b>		51	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>		
			<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		<p>For being able to reach on final exam student has to gain up to 51 points from theory classes and practicals and the tests.</p> <p>There is a possibility for <b>amendatory tests</b>, which can be taken by the end of the third/fourth semester, after the regular tests, but before the final exam. The student can choose one test (usually the one with the least points), but the points from the chosen test (taken regular) are deleted.</p> <p>Condition for reaching final exam: passed exam of course Cell biology.</p>		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		The student is obligated for active participation in all predicted activities for gaining points which are part of the final gaining.		

		<p><b>Tests</b></p> <ul style="list-style-type: none"> <li>• Eight in total, four in each semester, realized by writing</li> <li>• Each test from THEORY CLASSES contains 30 questions and each question gives 0.25 points (maximum 7.5 points per test)</li> <li>• Each tests from PRACTICALS contains 20 questions and each question gives 0.25 points (maximum 5 points per test)</li> <li>• The questions are answered by circling the correct answer from several offered and/or by filling in the gaps in the text.</li> </ul> <p><b>Theory classes:</b></p> <ul style="list-style-type: none"> <li>• <i>First test</i> - Basic virology (III semester)</li> <li>• <i>Second test</i> - DNA viruses, RNA viruses, prions (III semester)</li> <li>• <i>Third test</i> – Basic bacteriology and part of special bacteriology (IV semester)</li> <li>• <i>Fourth test</i> - Part of special bacteriology and mycology (IV semester)</li> </ul> <p><b>Practicals:</b></p> <ul style="list-style-type: none"> <li>• <i>First test</i> - Basic laboratory methods in virology (III semester)</li> <li>• <i>Second test</i> - Diagnosis of viral diseases by animal species and diagnosis of prion diseases (III semester)</li> <li>• <i>Third test</i> - Basic laboratory methods in bacteriology and mastitis (IV semester)</li> <li>• <i>Fourth test</i> - Diagnosis of bacterial and fungal diseases by animal species (IV semester)</li> </ul> <p><b>Final exam:</b> written.</p> <p>The total points of the final exam are 20, which can be gained with revision of knowledge that in the final exam comprises the whole material.</p> <p>In accordance with that the grading is divided in four thematic entiretys and every entirety can bring maximum 5 points. The thematic entiretys are</p> <p>I = Basic virology, genetics, genetic engineering and prions;  II = DNA and RNA viruses;  III = Basic bacteriology and mycology; and  IV = Special bacteriology.</p> <p>On the final exam the student gains points which are added to the previously gained points during the course, but with limitations of points by thematic entirety. For example, if on the final exam in June, the student gains 5 points from the first thematic entirety, in the next term (September), he/she cannot gain any more points from that entirety. Or if in the first final exam he/she gains 3 points in the next term, the student cannot gain more than 2 points from that entirety.</p>
22.	Textbooks	

	<b>Mandatory</b>	
<b>22.1</b>	<ol style="list-style-type: none"> <li>1. Talaro, K. and Chess B. Foundations in Microbiology (10<sup>th</sup> Ed.) McGraw Hill. 2017</li> <li>2. Quinn P.J., Markey, B.K., Leonard F.C., Fitzpatrick F.C., Fanning S. A Concise Review of Veterinary Microbiology.(2<sup>nd</sup> Ed.) John Wiley and Sons Ltd.2016</li> <li>3. Scott McVey D., Kennedy M., Chengappa M.M. Veterinary Microbiology (3<sup>rd</sup> Ed.). Willey-Blackwell. 2013</li> <li>4. MacLachlan J.N. and Dubovy J. E. Fenner's Veterinary Virology (5<sup>th</sup> Ed.). Elsevier. 2017</li> <li>5. Hirsh D.C., MacLachlan J.N, Walker R.L. Veterinary Microbiology. Blackwell Publishing. 2004</li> <li>6. ICTVdB – The Universal Virus Database of the International Committee on Taxonomy of Viruses (<a href="http://www.ncbi.nlm.nih.gov/ICTVdb/">http://www.ncbi.nlm.nih.gov/ICTVdb/</a>)</li> <li>7. G.R. Carter, D.J. Wise and E.F. Flores (Eds.) - A Concise Review of Veterinary Virology (<a href="http://www.ivis.org/advances/Carter/toc.asp">http://www.ivis.org/advances/Carter/toc.asp</a>)</li> </ol>	
<b>22.2</b>	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
<b>1.</b>	<b>Program course title</b>	<b>Rural economy</b>		
<b>2.</b>	<b>Code</b>	<b>FVM216</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>First year/Претех semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Blagica Sekovska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>			
	<i>Theory classes</i>			
	The aim of this course is to introduce the students with basic principles of the rural and agriculture economy. Because of the fact that doctors of veterinary medicine with their work are closely related with economy issues, and the importance of the agriculture policy in EU, some basic knowledge from the economy is necessary. The students would be introduced with basic economic terms, as well as with basic principles of the economy, with special concerning of the rural economy, and the functioning of small agriculture companies and farms which are one of the main units of the economic activities. Also, this course has to allow to the students to realize their responsibility as a part of the national economy, and the place and role of the veterinary profession in the total economy.			
	<i>Practicals</i>			
	The practical have to obtain support to the theory classes and to provide additional elaboration of some topics from the practical aspect, via different teaching methods, as dramatization of some hypothetic situations and problem solving, making different economic analyses about the economic benefits of the company as the risk analysis, cost-benefit analysis, discussions on some topics interesting for the students etc. Practical include also the visit of a company in rural region where some of the principles elaborated in the theory classes would be demonstrated practically.			
<b>11.</b>	<b>Brief content</b>			

	<p><b>Theory classes</b> Introduction. Rural economy. Production factors. Agrarian policy. Theory of production. Production intensity. Agricultural company. Characteristics and development of the rural economy in Republic of Macedonia. Role of the rural economy in national economy. Agricultural products market. Rural economy as a factor of the sustained development.</p> <p><b>Practicals</b> Rural economy. Production factors. Drop income theory. Agrarian policy. Visit of farm or other agriculture company. Economic evaluation of the company's gain. Rural economy regulatory instruments obtained by the state authorities. Risk analysis and cost-benefit analysis. Management of a farm.</p>			
12.	<p><b>Methods of studying</b> Theory classes: interactive (lectures with discussion and active participation of the students). Practicals: practicals with dramatization of situation, case study, presentation of some teaching units by the students, discussion about topics of interest and other ways of work in smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Theory classes: 20 hours Practicals: 10 hours		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>20 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>10 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>20 hours</b>
17.	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
	<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	<b>Attendance on theory classes</b>		<b>16</b>	<b>22</b>
	<b>Attendance and activity (knowledge) on practicals</b>		<b>16</b>	<b>22</b>
	<b>Written essay</b>		<b>6</b>	<b>16</b>
	<b>Tests (two)</b>		<b>11(x2)=22</b>	<b>20(x2)=40</b>
<b>Final exam</b>		<b>optional</b>		
<b>Total:</b>		<b>60</b>	<b>100</b>	
18.	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test. Final exam is predicted on written request of the student if he/she want to gain grade mark higher than one which was gained with his/her previous activities. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: general part Second test: special part <b>Final exam:</b> not predicted <b>Complete final exam:</b> optional
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>1. S. W. Johnson, Rural economy , 2014</li> <li>2. Thomas Nixon Carver, Principles of Rural Economics</li> <li>3. G.B. Masefield, Types of Rural Economyby</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Immunology</b>		
2.	<b>Code</b>	<b>FVM217</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Second year/winter semester</b>	<b>ECTS credit points</b>	<b>3.2</b>
8.	<b>Teacher</b>	<b>Prof. Slavcho Mrenoshki, PhD</b> <b>Ass. Prof. Irena Celeska, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<b>Program course goals (competencies):</b>			

	<p><b>Theory classes.</b> This course is about the main principles and mechanisms included in the immune system in animals and humans. The features of the immune response would be elaborated on the structural and functional aspects of the immune system. Special attention is given on mechanisms involved in the innate and acquired i.e. humoral and cellular immune response within the reaction of the organism on the infection with pathogenic microorganisms. Also, subject of this course are both the principles of vaccination, transplantation, tumor immunology, as well as immunopathology, which includes hypersensitivity reactions, autoimmune diseases and immunodeficiencies.</p> <p><b>Practicals</b> included in this course have aim to introduce student with the main immunological techniques for detection and diagnosis of the infectious diseases.</p>			
<b>11.</b>	<p><b>Brief content</b> <b>Theory classes</b> Three lines of defense. Participants in the immune response. Main features of the immune response. Immune system – development and structure. Blood and blood elements. Organs and tissues of the immune system. Lymphocytes and immune system duality. Antigens. Antibodies. T lymphocytes. Histocompatibility antigens. Mother-fetus relationship during gravidity. Immunotholerance. Control of the immune response. Complement. Serological reactions. Innate immunity. Acquired immunity. Immunity against bacterial infections. Immunity against viral infections. Immunity against fungal infections. Immunity against parasite invasions. Tumor immunology. Hypersensitivity (allergy). Transplantation immunology. Autoimmunity. Immunodeficiency. Immunomodulation.</p> <p><b>Practicals</b> Introduction in serological reactions. Radioimmunoassays. Immunofluorescence assays. Enzyme-linked immunoassays. Precipitation. Antibody titration. Agglutination. Virus hemagglutination and inhibition of hemagglutination. Complement-fixation test. Assays performed in live systems (neutralization and preventive assays). Cellular immune response detection tests. Diagnostic application of the immunoassays.</p>			
<b>12.</b>	<p><b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups</p>			
<b>13.</b>	<b>Total available time</b>	<b>80 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 15 hours Practicals: 30 hours		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>35 hours</b>
<b>17.</b>	<b>Method of assessment</b>			

	<b>Points gained by student's activities:</b> Attendance on every lecture i.e. practical takes 1 point.	
	<b>Type of activity</b>	<b>Points</b> minimum      maximum
	Attendance on theory classes	7.5      15
	Attendance on practicals	7.5      15
	Tests – theory classes (two)	15      30
	Tests – practicals (two)	10      20
	Final exam	11      20
	<b>Total:</b>	51      100
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b> <b>5 (five) (F)</b>
		<b>from 51 to 60 points</b> <b>6 (six) (E)</b>
		<b>from 61 to 70 points</b> <b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b> <b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b> <b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b> <b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	For being able to reach the final exam student has to gain up to 51 points from theory classes and practicals and the tests. There is a possibility for <b>amendatory tests</b> , which can be taken by the end of the third semester, after the regular tests, but before the final exam. The student can choose one test (usually the one with the least points), but the points from the chosen test (taken regular) are deleted. Condition for reaching final exam: passed exam of courses Cell biology and Microbiology.
<b>20.</b>	<b>Teaching language</b>	<b>English</b>
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> Written. The total points of the final exam are 20, which can be gained with revision of knowledge that in the final exam comprises the whole material. In accordance with that the grading is divided in three thematic entiretys and every entirety can bring maximum these points: - Thematic entirety I = 7 points - Thematic entirety II = 7 points - Thematic entirety III = 6 points On the final exam the student gains points which are added to the previously gained points during the course, but with limitations of points by thematic entirety. For example, if on the final exam in June, the student gains 7 points from the first thematic entirety, in the next term (September), he/she cannot gain any more points from that entirety. Or if in the first final exam he/she gains 3 points in the next term, the student cannot gain more than 4 points from that entirety.
<b>22.</b>	<b>Textbooks</b>	
	<b>22.1</b>	<b>Mandatory</b>

		1. Tizard, I.R., Veterinary Immunology, An Introduction (Ninth Edition). Elsevier Saunders, 2013
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Communication in veterinary practice		
2.	Code	FVM218		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Blagica Sekovska, PhD Prof. Plamen Trojchanec, PhD		
9.	Preconditions	Completed all courses from I and II semester. Realized extra mural practice in I year.		
10.	<b>Program course goals (competencies):</b>	<p><b>Position of the course in veterinary education:</b> EAEVE recommendations regarding veterinary student competence are directed towards increasement of so-called “life skills” (also nown as “soft skills”), and especially communication skills. This course is introduced in the faculty curriculum as intension for improvement of the communication skills of future doctors of veterinary medicine.</p> <p><b>Aim of the course:</b> Training students for successful communication with clients, patients and colleagues. The expected outcome is mastering the generl communication skills, professional communication with emphasis on assertive behavior during the communication with clients.</p> <p><b>Connection to the course with previous and further education:</b> This course is related with all clinical courses, especially with internal diseases courses, surgery courses, clinical practices as well as Basic management with management of veterinary practice.</p>		
11.	<b>Brief content</b>	<p><b>Theory classes</b></p> <p>What is communication, concept and role of communication. Elements of communication process. Language and speech, verbal communication. Other types of communication – nonverbal, ambient, facial, voice communication etc.; Oral and written communication. Problems during the communication and their solving. Current communication forms – internet, social networks etc. Official and business communication. Medical communication. Specifics of veterinary-medical communication. Strategies for improvement of communicational skills.</p> <p><b>Practicals</b></p> <p>What is appropriate communication. Active listening. Emotional tone of the communication. Assertively. Rules of communication with clients; Rules and practical examples of communication in</p>		

	veterinary medicine. Verbal and nonverbal communication – practical examples. Tough clients. Improvement of communication skills. Communication examples from veterinary practice.				
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures with discussion and active participation of the students). Practicals: practicals with dramatization of situation, case study, presentation of some teaching units by the students, discussion about topics of interest and other ways of work in smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.				
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>			
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)			
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
		<i>Type of activity</i>		<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			<b>Attendance on theory classes</b>	<b>10</b>	<b>20</b>
			<b>Attendance on practicals</b>	<b>10</b>	<b>20</b>
			<b>Test – theory classes</b>	<b>20</b>	<b>30</b>
			<b>Practical exam</b>	<b>20</b>	<b>30</b>
			<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		Students, who attend less than 30% of total <b>theory classes</b> , will not receive any points on attendance. Attendance between 30-60% brings 3 points, while the attendance in more than 60% of theory classes brings 5 points. Students that attended on less than 40% of <b>practicals</b> will not receive any points. Attendance between 40-70% at practicals brings 5 points, while attendance in more than 70% brings 10 points.		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. Students who have not received a positive evaluation from both tests or they are not satisfied with their results, can take a final exam. In this case, previously gained points are not included in the calculation. The tests are performed at precisely given date and are required for all the students.
22.	<b>Textbooks</b>	
	22.1	<b>Mandatory</b>
		1. Laurel Lagoni, Dana Durance, "Conecting with clients", AAHA Press
22.2	<b>Additional</b>	
	Current internet web pages recommended by the course teacher.	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Pathophysiology</b>		
2.	<b>Code</b>	<b>FVM311</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>9.5</b>
8.	<b>Teacher</b>	<b>Prof. Igor Ulchar, PhD</b> <b>Ass. Prof. Irena Celeska, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<b>Program course goals (competencies):</b>			
	<b>Theory classes</b>			
	Pathophysiology is upgrade of the knowledge acquired with the preclinical courses such as: Chemistry, Biophysics, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutrition of domestic animals, Physiology of animals, Microbiology and Immunology at it is parallel with such courses as Pathology, Pharmacology, Veterinary toxicology and Parasitology and parasitic diseases. The aim of pathophysiology are the mechanisms and ways of pathology processes (pathogenesis), so the students are introduced in clinical courses which are very important for gaining over veterinary medicine studies.			
	<b>Practicals</b>			
	The subject of practicals are laboratory methods for determination the changes in pathophysiology processes (clinical pathology): hematology disorders, metabolic disorders, disorder in cardiovascular,			

	intestinal and respiratory systems, clinical enzymatology, tests for determination of hepatocellular disorders, exocrine pancreas, renal failure, urinalysis, endocrinology tests, metabolic profile tests, tumors immunology, blood group typing, basic principles of veterinary cytology.
<b>11.</b>	<p><b>Brief content</b></p> <p><b>Theory classes</b></p> <p>Introduction to pathophysiology. Regulation mechanisms. Disorders of cell function. Pathophysiology of blood. Disorders in red blood cells function. Disorders in white blood cells function. Haemostatic disorders. Disorders in heart function. Disorders in blood vessels. Metabolic disorders. Disorders in gastrointestinal system. Disorders in function of liver and exocrine pancreas. Disorders in respiratory system. Disorders in urinary system. Endocrine disorders. Endogenous biological active substances in pathophysiological processes . Syndrome of general adaptation (Stress-syndrome). Inflammation. Shock (collapse). Pathophysiology of pain. Disorders of the immune system. Disorders of thermoregulation. Neuromuscular disorders. Pathophysiology of malignant processes. Discussion on particular cases.</p> <p><b>Practicals</b></p> <p>Definition and basically principles of veterinary clinical pathology. Factors which have impact on laboratory result: Biological and analytical factors (pre instrumental, instrumental, post instrumental). Clinical application of tests results. Reference values. Measurement units. Test validation. Blood sampling, equipment of blood sampling, anticoagulants. Laboratory instruments and equipment. Electrolytes and acid base balance: composition of body fluids, abnormalities of serum concentration of sodium, potassium and chlorides; determination of acid base balance. Hematological tests – hemogram; packed cell volume and total proteins; red blood cells count, hemoglobin, white blood cells differential count, platelet count, morphology and MPV; histograms, estimation of blood smears. Red blood cell disorder: polycythemia (erythrocytosis) and types of anemia. White blood cells: type of white blood cells – function and interpretation of white blood cells blood changes. Hemostasis: normal hemostasis, clinical signs of hemostatic disorder, sampling and keeping. Bone marrow – sampling and interpretation: indication and contraindication, sampling, estimation of cell lines; erythropoiesis, megacariopoiesis, myelopoiesis. Cardiovascular disorder and irregular distribution of body fluids. Glucoses: physiological features and measurement; abnormalities. Lipids: physiological features and measurement; abnormalities. Ketone bodies: types and increasing reason. Proteins: physiological features. Measurement: serum proteins and electrophoresis; abnormalities in serum protein concentration. Fibrinogen. Minerals: macroelements and oligoelements. Gastrointestinal disorders. Ruminal microflora examination. Clinical enzymatology, liver enzymes, hepatogram. Liver. Tests for determination of hepatocellular injury, cholestasis and liver disfunction. Disorders of exocrine pancreas. Respiratory disorders. Clinical examination of renal function. Urinalysis, physical characteristic of urine, physic-chemical characteristic, chemical characteristic, determination of glucosuria, proteinuria, examination of organize and non organize urine sediment. Endocrinological tests: thyroid hormones, corticosteroids; other hormones: parathyroid, insulin, growth hormone. Metabolic profile tests. Immunology of tumors. Inflammation. Shock. Blood types and transfusiology: systems of blood types, typisation of blood types and cross reactions; definition, indications for transfusiology. Immune disorders. Muscle: tests for myocytic injury and myocytic activity. Neurological disorders. Introduction in clinical cytology: samples; sample handling, advantages and limitations, characteristic of benign lesions, (inflammation, hematoma, lypoma, cysts, syaloccele). Cytology of tissue mass and organs. Analysis of body fluids: transudate, modified transudate, exudates, neoplastic effusions, other (hemoperitoneum, uroperitoneum, chilus). Cytology of neoplastic masses: benign neoplasm; cytological criteria of malignancy. Lymph node cytology. Cytology of cerebrospinal fluid (CSF), synovial fluids and effusions. Sampling procedures. Discussion on particular cases.</p>
<b>12.</b>	<p><b>Methods of studying</b></p> <p>Theory classes: interactive (lectures in large group with discussion and active participation of the students).</p>

	Practicals: practicals and other ways of work with smaller groups.			
<b>13.</b>	<b>Total available time</b>	<b>227.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	V semester Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours) VI semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>92.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on theory classes – V semester</b>	<b>2.00</b>	<b>3.75</b>
		<b>Attendance on theory classes – VI semester</b>	<b>2.00</b>	<b>3.75</b>
		<b>Attendance on practicals – V semester</b>	<b>2.04</b>	<b>3.75</b>
		<b>Attendance on practicals – VI semester</b>	<b>2.00</b>	<b>3.75</b>
		<b>Test 1</b>	<b>/</b>	<b>1.25</b>
		<b>Test 2</b>	<b>/</b>	<b>1.25</b>
		<b>Test 3</b>	<b>/</b>	<b>1.25</b>
		<b>Test 4</b>	<b>/</b>	<b>1.25</b>
		<b>Final exam (first part)</b>	<b>0</b>	<b>30</b>
		<b>Final exam (second part)</b>	<b>0</b>	<b>50</b>
		<b>Total:</b>	<b>8,04</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Attendance on theory classes in two semesters in total takes maximum 7.5 points (3.75 points per semester), i.e. 0.125		

		<p>points per every hour. For gaining course teacher's signature, student has to attend minimum 16 from total of 30 hours theory classes in V semester, what is minimum 2 points, and minimum 16 from total of 30 hours theory classes in VI semester, respectively, what is also minimum 2 points.</p> <p>Attendance on practicals in V semester takes 3.75 points, i.e. 0.083 points per every hour. For gaining course teacher's signature, student has to attend minimum 24.5 from total of 45 hours of practicals in V semester, what is minimum 2.04 points.</p> <p>Attendance on practicals in VI semester takes 3.75 points, i.e. 0.125 points per every hour. For gaining course teacher's signature, student has to attend minimum 16 from total of 30 hours of practicals in VI semester, what is minimum 2 points.</p> <p>Justified absences both on theory classes and practicals can be reimbursed at the course teacher with colocoivium.</p> <p>The tests contain 10 questions from theory classes and 10 question from practicals. The test is concerned ass passed with 6 correct answers from the theoretical, and 6 correct answers from the practical part. Passed test takes 1.25 points.</p> <p>If student does not pass sam of the tests, he/she has opportunity to reach such test at the end of the semester. Passing of all four tests is condition for reaching the final exam.</p> <p>The final exam has to parts (first and second). First part contains teaching topics (theory classes and practicals) from V semester, and takes maximum 30 points. It contains 3 questions from theory classes and 3 questions from practicals. Every correct answer takes 5 points. If not passed in January exam session, it can be reached in two further exam sessions.</p> <p>Second part contains teaching topics (theory classes and practicals from VI semester, and takes maximum 50 points. It contains 5 questions from theory classes and 5 questions from practicals. Every correct answer takes 5 points. Both parts of the final exam are oral, but on student's demand they can also be written.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Biochemistry, Cell biology, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrition of domestic animals, Animal husbandry and Animal hygiene.</p>
20.	Teaching language	English

21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (four):</b> written</p> <p>Test 1: Introduction to pathophysiology. Regulation mechanisms. Disorders of cell function. Pathophysiology of blood and blood cells.</p> <p>Test 2: Cardiovascular system. Metabolism. Digestive system. Liver and exocrine pancreas.</p> <p>Test 3: Respiratory system. Urinary system. Endocrine system. Defence reactions.</p> <p>Test 4: Immune system disorders, Thermoregulation. Neuromuscular disorders. Pathophysiology of tumors.</p> <p><b>Final exam:</b> first part: teaching topics from Tests 1 and 2; second part: teaching topics from Tests 3 and 4.</p>
22.	<b>Textbooks</b>	
22.1	<b>Mandatory</b>	
	<ol style="list-style-type: none"> <li>1. Igor Ulchar: Pathophysiology – theory classes (authorized script), in electronic format (updated every year);</li> <li>2. Irena Celeska: Pathophysiology practicum (authorized script), in electronic format (updated every year);</li> </ol>	
22.2	<b>Additional</b>	
		<ol style="list-style-type: none"> <li>1. M. Donald McGavin, James F. Zachary: Pathologic Basis Of Veterinary Disease 2007, Mosby, Inc.</li> </ol>

Attachement No. 3	First, second and third cycle course program		
1.	Program course title	Pharmacology	
2.	Code	FVM312	
3.	Study program	Veterinary medicine	
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje	
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies	
6.	Study year / semester	Third year/winter, summer semester	ECTS credit points <b>9.0</b>
8.	Teacher	Prof. Romel Velev, PhD	
9.	Preconditions	Completed all courses from I to IV semester. Realized extra mural practice in II year.	
10.	<b>Program course goals (competencies):</b> <i>Theory classes</i> of course Pharmacology aim to introduce students with the structure, mode of action and pharmacokinetics of the individual groups of veterinary drugs; scientific basis for their safe and efficient use; ethical, environmental implications and implications on human health from use of veterinary medicines for the student to be able to demonstrate their knowledge and understanding of pharmacology as a basis for the study and practice of clinical veterinary medicine. In this way the		

	<p>future doctor of veterinary medicine will be allowed to acquire: knowledge to identify the indications for medical intervention; ability to select the most appropriate drug (or drugs) indicated for a particular disease or pathological condition, ability to use the drug at optimal dose and prescribed dosage regimen, the ability to provide advice and application of appropriate treatment in individual life or group of animals, ability to give advice on preventive veterinary medicine, including promoting optimal health and production.</p> <p><b>Practicals</b> of the course Pharmacology aim to introduce students with correct prescribing, dispensing, safe storage and safe removal of drugs, to acquaint students with various pharmaceutical forms of drugs and their characteristics; to introduce future doctors of veterinary medicine for the sources of data on licensed drugs and illustrates some abstract theoretical concepts through simple laboratory experiments.</p>			
<b>11.</b>	<p><b>Brief content</b>  <b>Theory classes</b>  <i>General pharmacology</i>: Introduction to the course. Origin of drugs and definition of drug. Pharmacotherapy, doses and drug dosing. Pharmacokinetics. Pharmacodynamics. Reactions between drugs and drug side effects. <i>Special pharmacology</i>: Pharmacology of CNS (CNS depressors and stimulators, psychotropic drugs). Pharmacology of PNS. Pharmacology of ANS. Pharmacology of the digestive tract. Pharmacology of the respiratory system. Pharmacology of the genital and urinary system. Pharmacology of the cardiovascular system and blood. Pharmacology of hormones. Pharmacology of skin and mucosae. Pharmacology of vitamins and minerals. <i>Chemotherapy of the microbial diseases (antimicrobial drugs)</i>: Introduction. Beta lactamic antibiotics (penicillins, cephalosporins). Aminoglycosides and aminocyclitols. Tetracyclines. Amphenicols. Macrolides, azalides, lincosamides, pleuromutilins. Peptide antibiotics. Other antibiotics. Synthetic antimicrobial substances. Antimycotic drugs. Antiviral drugs. Antiseptics and disinfectants. <i>Chemotherapy of malignancies (antineoplastic drugs)</i>: Antineoplastic drugs. Immunopharmacology. <i>Chemotherapy of parasitic diseases (antiparasitic drugs)</i>: Ectoantiparasitics. Endoantiparasitics.</p> <p><b>Practicals</b>  Introduction. Drug prescription (recipe). Crude forms of drugs. Half crude forms of drugs. Liquid forms of drugs. Prescription of recipes. Administration of drug in laboratory animals p/o, s/c, i/m, i/v, i/perit. Blood sampling in laboratory animals and determination of drug concentration in biological material. Detecting and effect of drugs on blood pressure in rat. Demonstration of direct and indirect method. Effect of drugs on isolated heart of rabbit. Visit of pharmacist.</p>			
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes and seminars: interactive (lectures in group with discussion and active participation of the students).  Practicals: auditory practicals, laboratory practicals and other ways of work.</p>			
<b>13.</b>	<b>Total available time</b>	<b>225 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	V semester: Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) VI semester: Theory classes: 3 hours/per week (45 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>75 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>60 hours</b>

16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	90 hours	
17.	Method of assessment				
	Points gained by student's activities:				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			Attendance on theory classes	12	15
			Attendance and activity (knowledge) on practicals	12	15
			Tests (three)	10(x3)=30	20(x3)=60
		Final exam	6	10	
		Total:	60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)	
			from 51 to 60 points	6 (six) (E)	
			from 61 to 70 points	7 (seven) (D)	
			from 71 to 80 points	8 (eight) (C)	
			from 81 to 90 points	9 (nine) (B)	
			from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam		<p>For being able to reach the final exam student has to gain minimum 12 points from both theory classes and practicals, and up to 10 points per test for the three tests. If student does not show result (less than 10 points) on some of the tests, he/she has to go on one of the predicted correcting tests. Final exam is required for students who did not gain less than 60 points with attendance on theory classes and practicals, and the three tests.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Microbiology, Immunology, Physiology of animals, Nutrition of domestic animals and Parasitology and parasitic diseases.</p>		
20.	Teaching language		English		
21.	Method of monitoring the quality of teaching process		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (three):</b> written  First test: General pharmacology  Second test: Special pharmacology (organ systems)  Third test: Chemotherapeutics  <b>Final exam:</b> written (prescription of recipes) and oral</p>		
22.	Textbooks				
	22.1	Mandatory			

	<p>1. Adams H. R.: <b>Veterinary Pharmacology and Therapeutics</b>. 8-th edition. Iowa State University Press. Ames, 2001.</p> <p>2. Brander G. C., Pugh D.M.: <b>Veterinary Applied Pharmacology and Therapeutics</b>. 5-th edition. Bailliere Tindall. London, 1991.</p> <p>3. Prescott. J. F., Baggot J. D., Walker R. D.: <b>Antimicrobial Therapy in Veterinary Medicine</b>. 3-rd edition. Iowa State University Press. Ames, 2000.</p> <p>4. Plumb.C D.: <b>Veterinary Drug Handbook</b>. 4-th edition. Iowa State University Press. Ames, 2002.</p>
22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Pathology		
2.	Code	FVM313		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/winter, summer semester	ECTS credit points	12.5
8.	Teacher	Prof. Trpe Ristoski, PhD		
9.	Preconditions	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	Program course goals (competencies):	<p><b>The theory classes</b> for the course Pathology are divided in two parts. The first part covers the General pathology which is studied in the V semester and introduces the pathologic processes and pathologic conditions in the organism which goal is a better understanding of the pathogenesis of the diseases to the students. The second part covers the Special pathomorphology which is studied in the VI semester. The special pathologic morphology has the purpose to acquaint the students with the pathoanatomic changes of all the organic systems. The correct establishment of the pathoanatomic changes will make the final diagnostic of the animals death easier for the students.</p> <p><b>The practicals</b> are also divided in two parts. The first part (V semester) has the purpose to acquaint the students with the basic characteristics of the pathohistological diagnostics, regarding the collecting and the preparation of the material for pathohistological diagnostics, the staining of the pathohistological preparates as well as establishing the final pathohistological diagnose. The second part (VI semester) has the purpose to acquaint the students with the equipment and the way of performing the autopsy of the animals. During the lectures every student will have the possibility to perform autopsy on different animal species (ruminants, nonruminants and poultry) and at the same time to notice the pathoanatomical changes and to establish the death cause of the animal.</p>		
11.	Brief content	<p><b>Theory classes</b>  <i>General pathology</i>: Introduction and history of the pathology. Etiology. Degeneration and necrosis. Circulatory system disorders. Inflammation. Regeneration. Tumours, malformations and death. Immunopathology. <i>Special pathomorphology</i>: Digestive system. Hematopoietic organs. Circulatory system. Respiratory system. Urinary system. Genital organs. Central nervous system. Endocrine glands. Skeletal and muscular system. Hearing and sight organs. Integument.</p>		

	<b>Practicals</b> Preparing and staining of the patohistological slides. Microscopic diagnostic of the patohistological slides. Introduction in the necropsy of the domestic animals (theoretic). Necropsy of ruminants (sheeps and goats). Necropsy of nonruminants (dogs, cats and pigs). Necropsy of poultry. Organic pathology. Therrain necropsy on large animals.																													
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals (pathohistology diagnostics during V semester animal necropsy during VI semester) Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.																													
<b>13.</b>	<b>Total available time</b>	<b>312.5 hours</b>																												
<b>14.</b>	<b>Organization of the course</b>	V semester: Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours) VI semester: Theory classes: 4 hours/per week (60 hours) Practicals: 4 hours/per week (60 hours)																												
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>90 hours</b>																										
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>105 hours</b>																										
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																											
		<b>16.2</b>	<b>Individual tasks</b>																											
		<b>16.3</b>	<b>Self-directed learning</b>	<b>117.5 hours</b>																										
<b>17.</b>	<b>Method of assessment</b>																													
	<b>Points gained by student's activities:</b>																													
			<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>12</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>12</td> <td>15</td> </tr> <tr> <td>Written assay</td> <td>3</td> <td>5</td> </tr> <tr> <td>Tests (four)</td> <td>10</td> <td>20</td> </tr> <tr> <td>Practical exam</td> <td>13</td> <td>20</td> </tr> <tr> <td>Final exam</td> <td>10</td> <td>25</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	12	15	Attendance and activity (knowledge) on practicals	12	15	Written assay	3	5	Tests (four)	10	20	Practical exam	13	20	Final exam	10	25	<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																													
	<i>minimum</i>	<i>maximum</i>																												
Attendance on theory classes	12	15																												
Attendance and activity (knowledge) on practicals	12	15																												
Written assay	3	5																												
Tests (four)	10	20																												
Practical exam	13	20																												
Final exam	10	25																												
<b>Total:</b>	<b>60</b>	<b>100</b>																												
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																										
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																										
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>																										
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>																										
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>																										
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>																										

19.	<b>Requirement for signature and taking the final exam</b>	For being able to reach the complete final exam (oral and practical part), student has to gain up to 45 points from theory classes, practicals, written assay and four tests. If the student gains up to 50 points from theory classes, practicals, written assay and four tests, he/she is liberated from the oral part of the exam. Student is required to pass practical parts of the exam. Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals.
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (four):</b> written <b>First test:</b> Introduction and history of pathology; Etiology; Degenerations; Necroses; Disorders in the circulatory system. <b>Second tests:</b> Inflammation; Regeneration; Tumours, malformations and death; Immunopathology. <b>Third test:</b> Digestive system; Hematopoetic system; Circulatory system; Respiratory system. <b>Fourth test:</b> Urinary system; Sex organs; Central nervous system; Endocrine glands; Skeletal and Muscular system; Organs for sight and hearing; Integument. <b>Practical exam:</b> Pathohistology and necropsy <b>Final exam:</b> oral <b>Complete final exam:</b> oral + practical (pathohistology and necropsy)
22.	<b>Textbooks</b>	
22.1	<b>Mandatory</b>	1. Norman Cheville: Ultrastructural pathology, 1994 2. Kumar, Cotran, Robbins: Basic Pathology, 7th edition, 2003 3. Jubb K., Kenedy P., Plamer N.: Pathology of domestic animals, 1992.
22.2	<b>Additional</b>	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>
1.	<b>Program course title</b>	<b>Parasitology and parasitic diseases</b>
2.	<b>Code</b>	<b>FVM314</b>

3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>9.0</b>
8.	<b>Teacher</b>	<b>Prof. Jovana Stefanovska, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<p><b>Program course goals (competencies):</b>  The study of the course Parasitology and parasitic diseases is made up of theoretical and practical part.. <i>The theoretical part</i> includes the morphology, biological characteristics, developments cycles, pathogenesis and immunity, clinical symptoms, diagnostics, treatment and prevention of major representatives of 5 groups of parasites in the taxonomic manner. (Protozoa, Platyhelminthes, Nematoda, Acanthocephala and Arthropoda).  <i>The practical part</i> is concerned on the morphology of adults and morphology of the development forms of parasites, development cycles and methods of diagnostics. The practical part is done in a laboratory with microscopes and microscopical parasite samples, micrometry, and student is got familiarized with the determination of parasites and the general methods of diagnostics of parasitic diseases.  The aim of this course is to educate the students about parasites and parasitic diseases which have particular importance in veterinary and public health. The knowledge that the students gain here will make it possible for them to independently determine, diagnose, treat and prevent parasitic diseases in domestic animals and parasitic zoonoses.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  Subject and contents or parasitology and parasitic diseases in domestic animals. General parasitology. General principles of parasitic diseases. Phylum Protozoa: subphylum Sarcomastigophora, order Zoomastigophorea, order Kinetoplastida, order Diplomonadida, order Trichomonadida, order Amoebida. Phylum Apicomplexa, class Sporozoea, order Eucoccididae, order Haemosporida. class Microspora. class Cilliophora. Phylum Plathelminthes: class Digenea, order Strigeatida, order Echinostomatida, order Opisthorchiida, order Plagiorchiida. order Cestoda, subclass Eucestoda: order Pseudophyllidea, order Cyclophyllidea. Phylum Nematelminthes, class Nematoda, ред Enoplida, order Rhabditida, order Strongylida, order Oxyurida, order Ascaridida, order Spirurida. Phylum Acanthocephala. Phylum Arthtopoda, class Arachnida, subclass Acari, order Metastigmata, Mesostigmata, order Prostigmata, order Astigmata, class Insecta: order Anoplura, order Mallophaga, order Dyptera, suborder Nematocera, suborder Brachycera, order Siphonaptera. Phylum Pentastomida.</p> <p><b>Practicals</b>  Rules of classification. Equipment and apparatus in parasitological laboratory. Microscope study and micrometry of parasites and pseudoparasites. Diagnostics methods for protozoar determining. Microscope examination. Microscope samples from the following genuses: genus Trypanosoma, genus Leishmania, genus Hexamita, genus Giardia, genus Trichomonas, genus Histomonas, genus Entamoeba, genus Eimeria, genus Isospora, genus Cryptosporidium, genus Sarcosystis, genus Besnotia, genus Toxoplasma, genus Neospora, genus Hepatozoon, genus Babesia, genus Theileria, genus Balantidium, genus Anaplasma, genus Borelia, genus Nosema, genus Schistosoma, genus Fasciola, genus Dicrocoelium, genus Paramphistomum, genus Echinostomum, genus Prostogonimus, genus Opisthorchis, Diphyllbothrium, Mesocestoides, genus Taenia (T. soleum, T. saginata, T. hydatigena, T. pisiformis, T. multiceps) and larval forms of tenias, genus Echinococcus, genus Dipylidium, genus Moniezia, genus Anoplocephala, genus Strongyloides, genus Strongylus, genus</p>			

	<p>Trichostrongylus, genus Haemonchus, genus Ostertagia, genus Cooperia, genus Nematodirus, Hyostrongylus, genus Globocephalus, genus Bunostomum, genus Ancylostoma, genus Uncinaria, genus Trichonema, genus Oesophagostomum, genus Chabertia, genus Amidostomum, genus Syngamus, genus Cyathostomum, genus Trichuris, genus Capilaria, genus Trichinella, genus Dictyocaulus, genus Protostrongylus, genus Metastrongylus, genus Ascaridia, genus Oxyuris, genus Heterakis, genus Thelazia, genus Habronema, genus Spirocerca, genus Macracanthorhynchus, genus Filaroides, genus Parafilaria, genus Onchocerca, genus Dirofilaria, genus Gnathostoma, genus Ixodes, genus Argas, genus Dermanyssus, genus Demodex, genus Trombicula, genus Sarcoptes, genus Notoedres, genus Knemidocoptes, genus Psoroptes, genus Chorioptes, genus Otodectes, genus Tabanus, genus Musca, genus Haematobia, genus Stomoxys, genus Glossina, genus Calliphora, genus Sarcophaga, genus Gasterophilus, genus Hypoderma, genus Oestrus, genus Culex, genus Aedes, genus Anopheles, genus Simulium, genus Phlebotomus, genus Culicoides, genus Hypobosca, genus Melophagus, genus Pulex, genus Ctenocephalides, genus Trichodectes, genus Felicola, genus Bovicola, genus Haematopinus, genus Linognathus, genus Pediculus, genus Linguatula. Detailed studying of larvae eggs in domestic animals parasites. Practical performance of parasitic disease diagnostic methods: coprological, hematological, serological, biochemical, urological, pathoanatomic, dermatological methods.</p>			
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups</p>			
<b>13.</b>	<b>Total available time</b>	<b>225 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	V semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) VI semester: Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>90 hours</b>
<b>17.</b>	<b>Method of assessment</b>			

		Points gained by student's activities:	
		Type of activity	Points minimum      maximum
		Attendance on theory classes – V semester	2.00      3.75
		Attendance on theory classes – VI semester	2.00      3.75
		Attendance on practicals – V semester	2.04      3.75
		Attendance on practicals – VI semester	2.00      3.75
		Test 1	/      1.25
		Test 2	/      1.25
		Test 3	/      1.25
		Test 4	/      1.25
		Final exam (first part)	0      30
		Final exam (second part)	0      50
		<b>Total:</b>	<b>8.04      100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	Passed tests are condition for reaching final exam. Both parts of the final exam are mandatory. Student must not be absent on more than 3 theory classes and practicals, respectively. Condition for reaching final exam: passed exam of course Cell biology.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (four):</b> written <b>Test 1:</b> General parasitology, phylum Protozoa <b>Test 2:</b> Phylum Apicomplexa and Plathelminthes. <b>Test 3:</b> Phylum Nematelminthes and Acanthocephala. <b>Test 4:</b> Phylum Arthropoda and Pentastomida. Test contain questions from topics absolved both on theory classes and practicals <b>Final exam:</b> oral	
22.	Textbooks		
	22.1	Mandatory	
		1. Dwight D. Bowman: Georgi's Parasitology for veterinarians.W.B. Saunders company, 2017. 2. Anne M.Zajac, Gary A. Conboy: Veterinary clinical parasitology. Willey Blackwell, 2014	
22.2	Additional		

--	--

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Clinical anatomy of animals		
2.	Code	FVM315		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third Year/winter semester	ECTS credit points	3.0
8.	Teacher	Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD		
9.	Preconditions	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<b>Program course goals (competencies):</b> <i>Practicals</i> Objective of the course Clinical anatomy of the animals is to introduce the students with the clinical anatomy of the head and neck, the thoracic and pelvic limb, the thorax, the abdomen, and the pelvic cavity. The students will learn how to identify the bones and external bone features on live animal, will learn to identify the muscle attachments, will learn about surgical approach to the cavities of the head, the neck structures, and organs and other anatomical structures of the thoracic and abdominal cavity, those in the extremities, will learn the names of the openings associated with the cranial nerves, and will identify the direction and distribution of the surface nerves and vessels of the head, neck, trunc, tail and the limbs.			
11.	<b>Brief content</b> <b>Practicals</b> Clinical anatomy of the head. Clinical anatomy of the neck. Clinical anatomy of the frontlimb. Clinical anatomy of the hindlimb. Clinical anatomy of the thoracic cavity. Clinical anatomy of the abdominal cavity. Clinical anatomy of the pelvic cavity.			
12.	<b>Methods of studying</b> Practicals: interactive (work in large group with discussion and active participation of the students; video presentations, slide presentations, CLIVE computer interactive software) and other ways of work with smaller groups. Realized by work in dissection room and work on anatomic models (work with native, fixed and plastinated models). Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay. Practical presentation of anatomic model made by group of students.			
13.	Total available time	75 hours		
14.	Organization of the course	Practicals: 3 hours/per week (45 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	45 hours

16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	30 hours
17.	Method of assessment			
	Points gained by student's activities:			
	<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	Attendance and activity (knowledge) on practicals		24	30
Written essay		6	10	
Final exam		predicted		
Total:		60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)
			from 51 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)
			from 71 to 80 points	8 (eight) (C)
			from 81 to 90 points	9 (nine) (B)
			from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam		Acquired minimum 12 points from attendance on practicals, delivered written essay. Condition for reaching final exam: passed exam of course Anatomy of animals.	
20.	Teaching language		English	
21.	Method of monitoring the quality of teaching process		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>There are no tests predicted</b> <b>Final exam:</b> is mandatory	
22.	Textbooks			
	22.1	Mandatory		
		<ol style="list-style-type: none"> <li>L Konig H.E., Liebich H.-G. Veterinary anatomy of domestic animals. Schattauer (Stuttgart - New York) textbook and Colour Atlas, 2004</li> <li>Sisson S., The anatomy of domestic animals. W.B. Saunders Company. Philadelphia and London, 1941</li> <li>Dyce K.M., Sack W.O., Wensing C.J.G. Textbook of veterinary anatomy. W.B. Saunders Company. Philadelphia- London-Toronto-Sydney_Montreal-Tokyo.1996</li> <li>Evans E., de Lahunta A. Guide to the dissection of dog. W.B Saunders Company Philadelphia-London-Toronto. 1971</li> <li>Evans E., Christensen G. Anatomy of the dog. W.B Saunders Company Philadelphia-London-Toronto. 1979</li> <li>Nomina Anatomica Vetreinarum. Internationa committee on veterinary Gross anatomical Nomenclature, Gent, Belgium,1992</li> </ol>		
22.2	Additional			

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Clinical and laboratory diagnostics in farm animals		
2.	Code	FVM316		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/summer semester	ECTS credit points	3.0
8.	Teacher	Prof. Dine Mitrov, PhD Ass. Prof. Igor Djadjovski, PhD		
9.	Preconditions	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<p><b>Program course goals (competencies):</b>  The aim of the course is to introduce the students with the main principles of the clinical and laboratory diagnostics in farm animals (ruminants and pigs). The clinical diagnostics is the link between preclinical and clinical education.  Clinical diagnostics is a part of the clinical pathology which uses most recent scientific methods for determination of the disease. Subject of the clinical diagnostics are disease symptoms of particular organs and organic systems, and the manner of their collection, systematization and analysis is elaborated. The task of diagnostics is to detect the disease and to find its nature.  Investigation of the biological materials is important tool for finding correct diagnosis and prognosis of the disease. Recent veterinary science in big part is based on the laboratory diagnostics. Only relevant laboratory results could contribute in finding the diagnosis. The aim of the practicals is the students to become familiar with the main laboratory methods for investigation of blood, urine, milk and other body liquids. The most important objective of the course is to solve the methods and evaluation of the results of the analyses which are necessary for result interpretation in subclinical and clinical disorders. This course is upgrading of the knowledge gained in preclinical and clinical courses, and it is most effectively applied in the practical analysis of the biological materials. Main objective of this course is development of the student's abilities for using the theoretical knowledge in the routine practice. With the theoretical and practical knowledge, students would be able for correct interpretation of the laboratory results.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  <i>Basis of clinical diagnostics:</i> Introduction. Previous introduction with the ill animal. Basic examination of the animal. Special examination of the animal. Examination of respiratory organs – upper respiratory tract. Examination of respiratory organs – lower respiratory tract. Examination of the cardiovascular system. Examination of the digestive tract in ruminants. Examination of liver in ruminants. Examination of urinary system. Examination of the nervous system. <i>Laboratory diagnostics:</i> Laboratory and special diagnostic methods.  <b>Practicals</b>  <i>Clinical diagnostics:</i> Introduction, approaching to the animal, fixation and safety handling. Anamnesis, national, habitus, trias and rumination (ruminants). Skin, mucoses, lymph nodules and lymph vessels. Respiratory tract. Cardiovascular system. Digestive tract, probing (nasal and oral probe), rectal exploration (cattle). Examination of abdomen in cattle. Urinary system, catheterization. Locomotory system. Nervous system. <i>Laboratory diagnostics:</i> Preparation of material for laboratory analysis. Preparation of glassware and equipment. Description of the whole sampling procedure (blood, serum, plasma, milk, tissues, organs, organic systems or whole corps). Interpretation of results.</p>			

<b>12.</b>	Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.																															
<b>13.</b>	<b>Total available time</b>	<b>75 hours</b>																														
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)																														
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>																												
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>																												
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																													
		<b>16.2</b>	<b>Individual tasks</b>																													
		<b>16.3</b>	<b>Self-directed learning</b>	<b>30 hours</b>																												
<b>17.</b>	<b>Method of assessment</b>																															
	<b>Points gained by student's activities:</b>																															
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>Minimum</i></th> <th><i>Maximum</i></th> </tr> </thead> <tbody> <tr> <td><b>Attendance on theory classes</b></td> <td><b>10</b></td> <td><b>15</b></td> </tr> <tr> <td><b>Attendance and activity (knowledge) on practicals</b></td> <td><b>17</b></td> <td><b>15</b></td> </tr> <tr> <td><b>Written essay</b></td> <td><b>0</b></td> <td><b>6</b></td> </tr> <tr> <td><b>Tests, (two theory classes)</b></td> <td><b>10+10 (20)</b></td> <td><b>20+20 (40)</b></td> </tr> <tr> <td><b>Practical exam (on farm)</b></td> <td><b>5</b></td> <td><b>5</b></td> </tr> <tr> <td><b>Final exam</b></td> <td><b>0</b></td> <td><b>10</b></td> </tr> <tr> <td><b>Total</b></td> <td><b>52</b></td> <td><b>91</b></td> </tr> <tr> <td><b>Complete final exam</b></td> <td colspan="2"><b><i>Grade mark / Points</i></b> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45</td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>Minimum</i>	<i>Maximum</i>	<b>Attendance on theory classes</b>	<b>10</b>	<b>15</b>	<b>Attendance and activity (knowledge) on practicals</b>	<b>17</b>	<b>15</b>	<b>Written essay</b>	<b>0</b>	<b>6</b>	<b>Tests, (two theory classes)</b>	<b>10+10 (20)</b>	<b>20+20 (40)</b>	<b>Practical exam (on farm)</b>	<b>5</b>	<b>5</b>	<b>Final exam</b>	<b>0</b>	<b>10</b>	<b>Total</b>	<b>52</b>	<b>91</b>	<b>Complete final exam</b>	<b><i>Grade mark / Points</i></b> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45	
<i>Type of activity</i>	<i>Points</i>																															
	<i>Minimum</i>	<i>Maximum</i>																														
<b>Attendance on theory classes</b>	<b>10</b>	<b>15</b>																														
<b>Attendance and activity (knowledge) on practicals</b>	<b>17</b>	<b>15</b>																														
<b>Written essay</b>	<b>0</b>	<b>6</b>																														
<b>Tests, (two theory classes)</b>	<b>10+10 (20)</b>	<b>20+20 (40)</b>																														
<b>Practical exam (on farm)</b>	<b>5</b>	<b>5</b>																														
<b>Final exam</b>	<b>0</b>	<b>10</b>																														
<b>Total</b>	<b>52</b>	<b>91</b>																														
<b>Complete final exam</b>	<b><i>Grade mark / Points</i></b> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45																															
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																													
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																													
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																													
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																													
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																													
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																													

<p><b>19.</b></p>	<p><b>Requirement for signature and taking the final exam</b></p>	<ul style="list-style-type: none"> <li>• To get right to reach final exam, the student has to gain minimum 40 points from the attendance of theory classes and practicals, written essay and practical exam.</li> <li>• If the student does not score required minimum on the first test, he/she could not reach the second one.</li> <li>• If the student passed only the first, but not the second test, that means that the student does not passed the tests, so he/she can not gain points from this issue.</li> <li>• Students who did not pass the tests goes directly on final exam (if they have previously collected a minimum of 40 points from the above listed activities).</li> <li>• The complete final exam has written and oral part, and depending on the grade mark gained, the student gets appropriate points.</li> <li>• Final exam could be reached by the students who had gained minimum 60 points from the attendance of theory classes and practicals, tests, written essay and practical exam, but who want to get higher grade mark from one predicted according points gained. Maximal score on the final exam is 10 points, and correspondents with student's answer. If the student's answer does not correspond with the desired grade mark, he/she keeps the grade mark got with previously gained points.</li> <li>• If the student has gained a minimum of 60 points on the basis of all activities, he/she is considered to have passed the exam, with a grade corresponding to the number of points collected, and has no obligation to go to the final exam.</li> <li>• If the student is not satisfied with the points gained on the tests, he/she can cancel them, and with points gained by other activities goes to complete final exam. In such situation the student loses the right on the points gained with tests, permanently.</li> <li>• Written essay is not mandatory. The student can ask for topic for written essay 30 days before the end of the semester, and the written essay must be delivered 10 days before scheduled term for exam.</li> <li>• Practical exam is mandatory and it is done on farm.</li> <li>• Condition for reaching final exam: passed exam of courses Chemistry, Cell Biology, Biochemistry, Anatomy of animals, Histology with embryology, Microbiology, Immunology, Physiology of animals, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Pathophysiology, Pathology.</li> </ul>
<p><b>20.</b></p>	<p><b>Teaching language</b></p>	<p><b>English</b></p>

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests:</b> written First test: Up to digestive tract; Second test: After digestive tract; <b>Final exam:</b> written or oral
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>1. Peter Jackson and Peter Cockcroft: Clinical examination of Farm Animals. University of Cambridge, UK, 2002.</li> <li>2. Ryane E. Englar: Performing the small animal physical examination.</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Diagnostic imaging methods</b>		
2.	<b>Code</b>	<b>FVM317</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/winter semester</b>	<b>ECTS credit points</b>	<b>3.0</b>
8.	<b>Teacher</b>	<b>Prof. Dine Mitrov, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<b>Program course goals (competencies):</b> <i>Theory classes</i> of the course Diagnostic imaging methods have aim to introduce the students with main principles of veterinary basic and clinical radiology, physiotherapy and ultrasonography. Basic radiology is quite important discipline, and gives information about the formation and physical features of X rays, their application in medicine, radiation sources and also formation of radiogram, where students are introduced with some rules of projection and geometry of radiograms. Also, the students would be educated with technique of making X ray film in dark chamber (manually) or with device for automatic film making. The special part of the course – clinical radiology comprises elaboration of all organic systems and their analysis (with application of contrast media). Clinical radiology is very important part of veterinary medicine and deals with various issues of pathological disorders in the organs and organic systems in domestic animals. Success of radiological diagnostics depends on knowledge of physical features of X rays, radiology procedure and application of various contrast techniques for examination. Also, proper interpretation of the radiograms requires excellent knowledge of anatomy and pathomorphology, physiology and pathophysiology of the organs and organic systems			

	<p>in domestic animals. Not to forget benefits got from anamnesis, clinical and laboratory data which are necessary for complete radiologic diagnosis.</p> <p>This course also includes physiotherapy, i.e. basic principles of diagnosis and therapy, as well as development of physical techniques for therapy in veterinary medicine. Physiotherapy is one of the oldest techniques for therapy in medicine. But nowadays this is one of most sophisticated therapy techniques, which uses all recent knowledge from the field of electronics, ultrasound, lasers, ionization rays, acupuncture and artificial light resources. Knowledge from the field of physical medicine for therapy and diagnostics is necessary not only for students of veterinary medicine, but also for colleagues involved in terrain practice in the ambulances and clinics.</p> <p>Special part of the course is elaboration and application of ultrasound for diagnostic purposes in veterinary medicine. Today, all around the world the ultrasound is widely used in clinical diagnostics in veterinary practice. Methods and techniques for use of ultrasound are always improving. In therapeutic purpose it is common to use continuous ultrasound, but in diagnostics the only solution is the impulse technique. Student would be also introduced with principles of work and diagnostic application of computer tomography (CT) and magnetic resonance (MR).</p> <p>On this way, the student after successful passing of the exam would be educated for application of diagnostic imaging techniques for diagnostic and therapeutic purposes in veterinary medicine.</p> <p><b>Practicals</b> within course Diagnostic imaging methods have aim to introduce the students with basic conditions essential for an radiology cabinet, X ray devices and their parts (graphic-scopic), explanation of basic principles of X ray image analysis, technique for making X ray films, analysis of organic systems with use of radiology techniques, application of contrast media (positive and negative). Also, the students would be introduced with basic principles of work and application of physiotherapy and ultrasonography devices in therapeutic and diagnostic purpose. The students would have ability to work with and to analyze radiograms, in groups, for every organic system separately.</p>		
11.	<p><b>Brief content</b></p> <p><b>Theory classes</b></p> <p><i>Basic radiology:</i> Introduction. X rays. Radiology technique. Elements of radiological pathology. <i>Special radiology:</i> Digestive tract. Respiratory and cardiovascular system. Urogenital system. Skeletal system. Forensic radiological diagnostics. <i>Physiotherapy:</i> Electrotherapy and electrodiagnostics. Phototherapy. Thermotherapy. Hydro-, masotherapy. Ultrasound, computer tomography and magnetic resonance</p> <p><b>Practicals</b></p> <p>X ray device and accessory parts. Physical feature of X rays, projection effects, intensity of tissue shadows. Scopy and graphy, X ray technique and X ray film and cassettes. Special radiological diagnostics, BaSO<sub>4</sub>, passage and evacuation of the contrast medium. Diagnostic analysis of radiograms, principles for analysis and determination of symptoms and special examination of foreign bodies in ruminants. Respiratory tract. Cardiovascular system. Urinary system. Genital system. Digestive tract. Practice of interpretation of radiograms. Skeletal system.</p>		
12.	<p><b>Methods of studying</b></p> <p>Theory classes: interactive, introducing the student with basis of diagnostic imaging via theoretical presentation of the teaching material, discussion with the students about the certain topic, seminar works for improvement of knowledge and use of worldwide reference literature and internet.</p> <p>Practicals: interactive, with groups, were the students are directly faced with a beat of diagnostics, connecting theory with practice, via interpretation of changes on the patient (organs) visible on the radiogram.</p>		
13.	<b>Total available time</b>	<b>75 hours</b>	
14.	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)	
15.	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>																												
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																													
		<b>16.2</b>	<b>Individual tasks</b>																													
		<b>16.3</b>	<b>Self-directed learning</b>	<b>30 hours</b>																												
<b>17.</b>	<b>Method of assessment</b>																															
	<b>Points gained by student's activities:</b> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>10</td> <td>14</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>12</td> <td>18</td> </tr> <tr> <td>Written essay</td> <td>0</td> <td>8</td> </tr> <tr> <td>Tests on theory classes (two)</td> <td>8+10 (18)</td> <td>10+12 (22)</td> </tr> <tr> <td>Test on practicals</td> <td>10</td> <td>14</td> </tr> <tr> <td>Final coloctvium</td> <td>10</td> <td>10</td> </tr> <tr> <td>Final exam</td> <td>0</td> <td>24</td> </tr> <tr> <td><b>Total</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table> <p>Scoring on complete final exam:</p> <p style="margin-left: 40px;">6 - 20 points 7 - 25 points 8 - 30 points 9 - 35 points 10 - 40 points</p>				<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	10	14	Attendance and activity (knowledge) on practicals	12	18	Written essay	0	8	Tests on theory classes (two)	8+10 (18)	10+12 (22)	Test on practicals	10	14	Final coloctvium	10	10	Final exam	0	24	<b>Total</b>	<b>60</b>
<i>Type of activity</i>	<i>Points</i>																															
	<i>minimum</i>	<i>maximum</i>																														
Attendance on theory classes	10	14																														
Attendance and activity (knowledge) on practicals	12	18																														
Written essay	0	8																														
Tests on theory classes (two)	8+10 (18)	10+12 (22)																														
Test on practicals	10	14																														
Final coloctvium	10	10																														
Final exam	0	24																														
<b>Total</b>	<b>60</b>	<b>100</b>																														
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																													
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																													
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																													
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																													
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																													
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																													
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>For being able to reach on the final exam, student has to gain up to 40 points from theory classes and practicals, the tests and the final coloctvium.</p> <p>If the student does not gain minimum points oh the first tests, he/she has no right on forward participation on other tests.</p> <p>If the student did not pass the tests, he/she has to go on final exam.</p> <p>Condition for reaching final exam: passed exam of courses Biophysics, Chemistry, Cell Biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Pathophysiology, Pathology.</p>																														
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																														

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests:</b> written First test: basic radiology; Second test: special radiology (organ systems). <b>Final colovvium:</b> diagnosis of radiograms. <b>Final exam:</b> written or oral.
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
22.1		<ol style="list-style-type: none"> <li>1. THRALL: Textbook of VETERINARY DIAGNOSTIC RADIOLOGY</li> <li>2. KJELD WAMBERG: ATLAS RADIOLOGICA</li> <li>3. ARLENE COULSON and NOREEN LEWIS: INTERPRETATIVE RADIOGRAPHIC ANATOMY OF THE DOG AND CAT</li> <li>4. WILLIAM D. CARLSON: VETERINARY RADIOLOGY</li> <li>5. JAMES W. TICER: RADIOGRAPHIC TECHNIQUE IN SMALL ANIMAL PRACTICE</li> <li>6. S. W. DOUGLAS and H. D. WILLIAMSON: VETERINARY RADIOLOGICAL INTERPRETATION</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Clinical biochemistry</b>		
2.	<b>Code</b>	<b>FVM318</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Velimir Stojkovski, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<b>Program course goals (competencies):</b>			
	<i>Theory classes</i>			
	Clinical biochemistry explores the chemical content of organisms during physiological and pathological processes in a living organism with the help of chemical and physic-chemical methods. As a complex discipline it explores the relations between physiological and pathological conditions, and chemical and cell content of liquids and tissues as well. Clinical biochemistry elaborates highly analytical diagnostic methods for examination of chemical and cell content of biological liquids and tissues.			
	Main aim of the subject is to introduce the students with the basic clinical biochemistry diagnostic applied in veterinary medicine.			
	Theoretical knowledge is evaluated with practical laboratory work.			
	<i>Practicals</i>			
	During the practical part students get experience in sampling, analyzing and results interpretation. They			

	get familiar with the basic analytical clinical biochemistry methods, which are of importance in veterinary medicine, as well as with the laboratory instruments. Students are required to work out short project summarizing their knowledge in clinical biochemistry diagnostic and present orally and discuss their findings.			
<b>11.</b>	<b>Brief content</b> <b>Theory classes</b> General topics, methods and techniques in clinical biochemistry. Sampling for analyses. Basic methods for material preparation for analyses. Water, electrolytes and oligoelements. Acid-base balance. Carbohydrates. Lipids. Proteins. Non nitrogen compounds. Hemoproteins. Enzymes. Hormones. Vitamins. Liver function assays. Medicament impact upon laboratory results. <b>Practicals</b> Determination of electrolytes and oligoelements. Examination of acid-base balance parameters. Glucose determination. Determination of total lipid, triglycerides and cholesterol. Determination of total protein, albumin and fibrinogen. Determination of urea, uric acid, creatine and creatinine. Determination of blood hemoproteins. Determination of LDH, SDH, GLDH, AST, ALT, CK, GGT, AP, CHE, LIPA and AMYL. Determination of hormones and vitamins. Liver function assays.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practical: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
	<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	Attendance on theory classes		6	10
	Attendance on practicals		6	10
	Activity (knowledge) on practicals		6	10
	Written assay		6	10
	Tests (two)		18	30
	Final exam		18	30
<b>Total:</b>		<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<ul style="list-style-type: none"> <li>• Attendance on the teaching is not scored if student was absent on more than 20% of classes;</li> <li>• Student who has gained up to 6 points from activity on practicals is liberated from passing practical exam;</li> <li>• Student can reach the final exam only with passed practical exam, delivered written assay and minimum 42 points gained on any mode;</li> <li>• Student is liberated from reaching final exam with passed practical exam, delivered written assay, results shown on three tests and minimum 61 points gained on any mode.</li> <li>• Condition for reaching final exam: passed exam of courses Chemistry, Biochemistry.</li> </ul>	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test: General topics, methods and techniques in clinical biochemistry. Sampling for analyses. Basic methods for material preparation for analyses. Water, electrolytes and oligoelements. Acid-base balance. Carbohydrates. Lipids.</p> <p>Second test: Non-nitrogen compounds. Hemoproteins. Enzymes. Hormones. Vitamins. Liver function assays. Medicament impact upon laboratory results.</p> <p><b>Final exam:</b> oral</p>	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>1. J. Kaneko, J. Harvey, M. Bruss (2008): <i>Clinical biochemistry of domestic animals</i>.6<sup>th</sup> ed. Academic press.</li> <li>2. Other available textbooks related with the topic, internet etc.</li> </ol>	
	<b>Additional</b>		
	<b>22.2</b>		

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Clinical and laboratory diagnostics in companion animals and equines		
2.	Code	FVM319		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/winter semester	ECTS credit points	3.0
8.	Teacher	Ass. Prof. Elena Atanaskova Petrov, PhD		
9.	Preconditions	Completed all courses from I to IV semester. Realized extra mural practice in II year.		
10.	<p><b>Program course goals (competencies):</b>  <i>The aim</i> of this course is to introduce the students with the main principles of the clinical and laboratory diagnostics in companion animals (dogs and cats) and equines. The clinical diagnostics is the link between preclinical and clinical education.  Subject of the clinical diagnostics are disease symptoms of particular organs and organic systems, and the manner of their collection, systematization and analysis is elaborated. The task of diagnostics is to detect the disease and to find its nature.  Investigation of biological materials is important tool for making correct diagnosis and prognosis of the disease. Vailable laboratory results can contribute in diagnosis making. The aim of the practicals is to train the students on most important laboratory methods of investigation blood, serum, urine and other body liquids from companion animals and equines. Most important goal of the course is to absolve methods and analysis result evaluation necessary for result interpretation in subclinical and clinical diseases. General goal of the course is to improve student's capacities to apply his/her theoretical knowledge in routine practice. Whith theoretical and practical data, students will be able for correct interpretation of laboratory results.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  <i>Basis of clinical diagnostics:</i> Introduction. Previous introduction with the ill animal. Basic examination of the animal. Special examination of the animal. Examination of respiratory organs – upper respiratory tract. Examination of respiratory organs – lower respiratory tract. Examination of the cardiovascular system. Examination of the digestive tract in equines and carnivores – upper part. Examination of the digestive tract in equines and carnivores – lower part. Examination of liver in equines and carnivores. Examination of urinary system. Examination of the nervous system. <i>Laboratory diagnostics:</i> Laboratory and specific diagnostic methods.  <b>Practicals</b>  <i>Clinical diagnostics:</i> Introduction, approaching to the animal, fixation and safety handling. Anamnesis, national, habitus, trias. Skin, mucoses, lymph nodules and lymph vessels. Respiratory tract. Cardiovascular system. Digestive tract – methods of clinical examination. Examination of abdomen in companion animals and equines. Urinary system, catheterization and cystocentesis. Locomotory system examination. Complete neurological examination. <i>Laboratory diagnostics:</i> Preparation of material for laboratory analysis. Description of the whole sampling procedure (blood, serum, plasma, tissues, organs, organic systems or whole corps). Interpretation of results.</p>			
12.	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups</p>			

	Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay (optional).																															
<b>13.</b>	<b>Total available time</b>	<b>75 hours</b>																														
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)																														
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>																												
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>																												
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																													
		<b>16.2</b>	<b>Individual tasks</b>																													
		<b>16.3</b>	<b>Self-directed learning</b>	<b>30 hours</b>																												
<b>17.</b>	<b>Method of assessment</b>																															
	<b>Points gained by student's activities:</b>																															
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>Minimum</i></th> <th><i>Maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>6</td> <td>8</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>10</td> <td>15</td> </tr> <tr> <td>Tests, (two, theoretical)</td> <td>10+10 (20)</td> <td>20+20 (40)</td> </tr> <tr> <td>Complete practical exam</td> <td>16</td> <td>37</td> </tr> <tr> <td><b>Total</b></td> <td><b>52</b></td> <td><b>100</b></td> </tr> <tr> <td><i>Final exam (optional)</i></td> <td>20</td> <td>40</td> </tr> <tr> <td><i>Written essay (optional)</i></td> <td>0</td> <td>5</td> </tr> <tr> <td>Complete final exam</td> <td colspan="2"> <u>Grade mark/ Points</u>  Six (6) / 20  Seven (7) / 25  Eight (8) / 30  Nine (9) / 35  Ten (10) / 40 </td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>Minimum</i>	<i>Maximum</i>	Attendance on theory classes	6	8	Attendance and activity (knowledge) on practicals	10	15	Tests, (two, theoretical)	10+10 (20)	20+20 (40)	Complete practical exam	16	37	<b>Total</b>	<b>52</b>	<b>100</b>	<i>Final exam (optional)</i>	20	40	<i>Written essay (optional)</i>	0	5	Complete final exam	<u>Grade mark/ Points</u> Six (6) / 20 Seven (7) / 25 Eight (8) / 30 Nine (9) / 35 Ten (10) / 40	
<i>Type of activity</i>	<i>Points</i>																															
	<i>Minimum</i>	<i>Maximum</i>																														
Attendance on theory classes	6	8																														
Attendance and activity (knowledge) on practicals	10	15																														
Tests, (two, theoretical)	10+10 (20)	20+20 (40)																														
Complete practical exam	16	37																														
<b>Total</b>	<b>52</b>	<b>100</b>																														
<i>Final exam (optional)</i>	20	40																														
<i>Written essay (optional)</i>	0	5																														
Complete final exam	<u>Grade mark/ Points</u> Six (6) / 20 Seven (7) / 25 Eight (8) / 30 Nine (9) / 35 Ten (10) / 40																															
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																													
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																													
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																													
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																													
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																													
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																													

19.	<b>Requirement for signature and taking the final exam</b>	<ul style="list-style-type: none"> <li>• To get right to attend final exam, the student has to gain minimum 32 points from the attendance of theory classes and practicals and practical exam.</li> <li>• If the student does not gain required minimum on the first test, he/she could not attend the second one.</li> <li>• If the student passed only the first, but not the second test, that means that the student does not passed the tests, so he/she could not gain points from this issue.</li> <li>• Students who did not passed the tests reach directly on complete final exam (if they have right to it).</li> <li>• The complete final exam has written and oral part, and depending on the grade mark gained, the student gets appropriate points.</li> <li>• If student gains minimum 52 points by all issues, he/she gets right to get grade mark in his/her index, according the points gained, without attending on final exam.</li> <li>• If the student is not satisfied with the points gained on the tests, he/she can cancel them, and with points gained by other issues reaches to complete final exam and looses his/her right on points gained with tests.</li> <li>• Written assay is not mandatory. The student could ask for topic for written assay 30 days before the end of the semester, and the written assay must be delivered 10 days before scheduled term for exam.</li> </ul>
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests:</b> written  First test: up to digestive tract;  Second test: after digestive tract</p> <p><b>Final exam:</b> written or oral</p>
22.	<b>Textbooks</b>	
22.1	<b>Mandatory</b> <ol style="list-style-type: none"> <li>1. Performing the Small Animal Physical Examination, Author: Ryane E. Englar . Wiley-Blackwell ISBN: 9781119295310</li> <li>2. BSAVA Guide to Procedures in Small Animal Practice, Editors: Nick Bexfeld, Karla Lee, British Small Animal Veterinary Association (BSAVA), 2010</li> <li>3. Blackwell’s Five-Minute Veterinary Consult: Laboratory Tests and Diagnostic Procedures: Canine &amp; Feline, Shelly L. Vaden, Joyce S. Knoll, Francis W.K. Smith, Jr., Larry P. Tilley, Wiley-Blackwell, 2009</li> </ol>	
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Internal diseases in companion animals and equines		
2.	Code	FVM411		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/winter, summer semester	ECTS credit points	10.5
8.	Teacher	Ass. Prof. Elena Atanaskova Petrov, PhD		
9.	Preconditions	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	<p><b>Program course goals (competencies):</b></p> <p><b>Definition of the course:</b> student gains knowledge of the internal diseases in the canine's, feline's and equine's organic systems, and refers to diseases of cardiovascular and respiratory system, gastrointestinal and liver diseases, urinary disorders and electrolyte imbalance, metabolic and neuromuscular diseases.</p> <p><b>Position of the course in veterinary education:</b> through this course students are introduced with the diseases in domestic animals (dogs, cats, equines) which need extended knowledge of the veterinary medicine, application of new diagnostic technologies, as well as adequate approach in therapeutic protocols for various diseases.</p> <p>In the <i>theoretical part</i> student gains knowledge of the categorization of the diseases of the organic systems, their pathogenesis, description and methodological approach of the clinical signs, diagnostic procedures and differential diagnostics, application of the therapeutic protocols, prognosis and prevention of the diseases or their eradication.</p> <p>In the <i>practical part</i> student meets with clinical cases in the veterinary clinic, that are related with the material from the theoretical part, systematization of the information gained during the physical examination of the patient, diagnostic procedures and monitoring of the treatment. Also students are going to actively participate in patients treatment.</p> <p><b>Relations of the course with previous and future education:</b> the course is connected with other disciplines of the veterinary medicine such as: pathophysiology, pathology, diet, microbiology, parasitology, immunology and epizootiology.</p> <p><b>General objectives of the course:</b> the general principle of this course is based on introducing the student with basically knowledge and practical experience that they need for prevention, treatment and resolutions of health problems in animals, especially pets (dogs, cats, and equines).</p>			
11.	<p><b>Brief content</b></p> <p><b>Theory classes</b></p> <p>Congenital heart diseases, valvular disorders, mitral dysplasia. Tricuspid dysplasia, acquired heart disease, bacterial endocarditic endocarditis – chronic valvular disease, myocardial diseases, dilated cardiomyopathy in dogs. Dilated cardiomyopathy in cats, cardiomyopathies in cats, pericardial effusion. Respiratory diseases, diseases of upper respiratory tract, rhinitis and neoplasia. Diseases of lower respiratory tract, cough, bronchopneumonia. Chronic bronchitis. Asthma in cats. Eosinifilic lung infiltration, bronchiectasis. Inhalation of foreign body in trachea and bronchi. Lung tumors. Collapse of trachea. Conditions that induce decreasing of lung capacity – effusions. Pyotorax, thoracic neoplasia, Pneumothorax Lung edema and emphysema, chronic alveolar emphysema. Diseases of mouth, teeth and salivary glands. Diseases of esophagus – oesophagitis, changes in patency. Diseases of the stomach: acute gastritis, foreign bodies and volvulus – acute stomach</p>			

	<p>dilatation. Chronic gastritis. Peptic ulcer, obstruction of the stomach excretion. Diseases of small intestines. Food enteropathies, hemorrhagic gastroenteritis in dog, bowel obstruction, bowel inflammation. Bacterial overgrowth in small intestines. Diseases of the large intestines, acute nonspecific colitis, plasmid-lymphatic colitis, noninflammatory colitis with diarrhea, colon obstruction, idiopathic megacolon, sinusitis paraanalis, colonal and rectal neoplasia. Colic syndrome. Diseases of exocrine pancreas. Inflammatory hepatobiliary diseases. Purulent and no purulent cholangitis/ cholangiohepatitis. Lymphocyte portal hepatitis. Obstruction of extrahepatic bile duct. Congenital port systemic shunts. Chronic and idiopathic chronic hepatitis. Congenital Porto-vascular anomalies. Bile tract disorders. Urinary disorders, acute and chronic renal failure. Glomerulonephropathies, cystic disorders, renal neoplasia. Infection of the urinary tract, urolythiasis. Lower urinary tract disorders in cats. Urinary bladder neoplasia, Prostatitis, benign prostatic hyperplasia. Endocrine disorders, pituitary gland disorders, Diabetes insipidus. Thyroidal disorders – hypothyroidism, hyperthyroidism. Parathyroid disorders – hyperparathyroidism, hyperparathyroidism. Adrenal glands – hypoadrenocorticism (Addison's disease), hyperadrenocorticism (Cushing disease). Diabetes mellitus. Neurology disorders. Brain disorders – hydrocephalus. Canine granulomatous meningoencephalomyelitis. Ischemic encephalopathy, head injury. Cranial nerves. Paralysis of n. facialis, trigeminus, Horner-syndrome. Spinal cord, lumbosacral stenosis, intervertebral diseases. Degenerative myelopathie, dyscospondilitis. Epilepsy, idiopathic epilepsy. Myasthenia gravis.</p> <p><b>Practicals</b></p> <p>Approach to patients with heart disorders, basic diagnostic principles. Systematization of clinical signs in heart diseases and heart murmurs. ECG procedures, VHS- measurements (vertebral heart score), therapy protocols in cardial diseases. Case reports from students related with cardial diseases. Respiratory diseases, approach to patients with respiratory diseases, basic diagnostic procedures. Auscultation and recognition of respiratory murmurs. Interpretation of diagnostic procedures in respiratory diseases. Case reports from students related with respiratory diseases. Approach to patients with gastro-intestinal disorders, diagnostic procedures. Systematization of clinical signs, determination of the degree of changes in the organs. Fluid therapy, follow up patients with diarrhea. Case reports from students related with gastro-intestinal diseases Colic diseases in horses, systematization of clinical signs. Colic diseases in horses, sounding the stomach, rectal exploration. Case reports from students related with colic diseases in horses. Patients with hepatic diseases, systematization and diagnosis. Approach and treatment of patients with hepatic diseases. Changes in exocrine pancreas and their spatial diet. Patients with renal failures, assessment of the general condition, diagnostic approach. Therapy of renal failure, follow up patients condition. Analyzing the results during therapy of renal failure. Disorders of the urinary tracts, catheterization, puncture of the urinary bladder. Case reports from students related with renal failure. Patients with endocrine disorders, following laboratory protocols. Therapy protocols in endocrine diseases. Neurological disorders, approach to patients with neurological disorders. Examination of the reflexes associated with cranial nerves. Examination of the reflexes associated with the limbs. Approach to patients with epilepsy, following therapy protocols Case reports from students related with neurologic diseases.</p>	
12.	<p><b>Methods of studying</b></p> <p>Theory classes: including presentations prepared by the students with interactive discussion  Practicals: working with groups of 8-10 students, working on certain clinical cases, preparation of case-report by the students.  Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>	
13.	<b>Total available time</b>	<b>262.5 hours</b>
14.	<p><b>Organization of the course</b></p> <p>VII semester  Theory classes: 2 hours/per week (30 hours)  Practicals: 4 hours/per week (60 hours);  VIII semester</p>	

			Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)	
15.	Forms of teaching activities	15.1	Lectures - theory classes	60 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	105 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	97.5 hours
17.	Method of assessment			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	10	15
		Attendance and activity (knowledge) on practicals	17	22
		Written essay	0	8
		Tests (two)	10+10=20	20+20=40
	Final colovium	5	5	
	Final exam	0	10	
	Total:	52	100	
	Complete final exam	<i>Grade mark/ Points</i> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45		
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)
		from 51 to 60 points		6 (six) (E)
		from 61 to 70 points		7 (seven) (D)
		from 71 to 80 points		8 (eight) (C)
		from 81 to 90 points		9 (nine) (B)
		from 91 to 100 points		10 (ten) (A)

19.	<p><b>Requirement for signature and taking the final exam</b></p>	<ul style="list-style-type: none"> <li>• Student in order to gain right to take final exam, needs to score min 40 scores from theory classes and practicals, tests and the final colocvium. If the student fails in gaining the minimal points from the first test, he/she doesn't have right to take the second.</li> <li>• The students that failed to pass the tests can take the complete final exam (if they fulfill the conditions).</li> <li>• The complete final exam contains written and oral part. According to the student's grade, they will gain appropriate points.</li> <li>• Final exam eligible students who have gained at least 60 points based on theory classes and practicals, tests and final colocvium and want a higher grade than that which is predicted by the number of points they have got. Student will receive points only if his/her response is appropriate to the rating of which supports student.</li> <li>• The final colocvium is mandatory and it takes place in a Clinic.</li> <li>• Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Diagnostic imaging methods, Clinical biochemistry.</li> </ul>
20.	<b>Teaching language</b>	<b>English</b>
21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two)</b>  <b>Final exam:</b> written or oral  <b>Complete final exam:</b> written and oral part</p>
22.	<b>Textbooks</b>	
	22.1	<p><b>Mandatory</b></p> <p>1. M. Schaer Clinical medicine of the dog and cat; Manson publishing 2003  2. R.W. Nelson, C.G. Couto, Small animal internal medicine, second edition Mosby Publishing  3. Stephen J Ettinger, Edvard C. Feldman. Veterinary Internal Medicine, 7<sup>th</sup> edition.</p>
	22.2	<p><b>Additional</b></p>

--	--

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Reproduction		
2.	Code	FVM412		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/winter, summer semester	ECTS credit points	15.0
8.	Teacher	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD		
9.	Preconditions	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	<p><b>Program course goals (competencies):</b></p> <p><b>Theory classes</b> in course <i>Reproduction</i> are aimed to introduce the students with the main theoretical principles of reproduction in domestic animals: gynecology, obstetrics, infertility, artificial insemination, physiological and pathological conditions present during gestational and puerperal period in the dam and in the fetus, main endocrine mechanisms that controls reproduction, manipulative techniques, recent technologies of assisted reproduction, Andrology, diseases of the mammary gland, as well as neonatal diseases.</p> <p>The future doctor of veterinary medicine would be able to gain knowledge to recognize: indication for medical treatment during reproductive problems and infertility, pathological changes present during gestation; ability to suggest and provide the proper treatment in case of infertility; able to use prophylactic measures and interventions to improve productivity and reproductive status on a particular animal, or on a herd level in farm animals.</p> <p><b>Practicals</b> in course <i>Reproduction</i> are aimed to enable the students to gain practical skills to distinguish normal versus pathological reproductive conditions in animals, most important interventions implemented in practice related to reproduction, obstetrics and infertility. Use of proper treatment necessary to improve the reproductive performance in both productive and companion animals, artificial insemination and other assisted reproductive techniques implemented in practice.</p>			
11.	<p><b>Brief content</b></p> <p><b>Theory classes</b></p> <p>Introduction. Anatomy and Physiology of the female genital organs. Anatomy and Physiology of male genital organs. Physiology of pregnancy. Physiology of parturition. Physiology of puerperium. <i>Endocrinology and control of reproduction:</i> Introduction. Puberty control. Control of the estrous cycle and ovulation. Control of seasonal reproduction. Artificial insemination (AI). Control of multiple deliveries and litter size. Control of pregnancy, parturition and post-partum period. Embryo transfer. <i>In-vitro</i> production of embryos. Cloning technology. Production of transgenic animals. Suppression of the reproductive activity. Stress and reproduction. Lactation; Pathology of pregnancy, parturition and puerperium. Neonatal diseases. Artificial insemination (AI). Mammary gland diseases. Inherent infertility in cows. Acquired infertility in cows. Extra-genital infertility. Infertility in ewes and does. Infertility in sows. Infertility in mares. Infertility in carnivores. Infertility in male animals.</p>			

	<b>Practicals</b> Anatomy of female and male reproductive tract. Gynecological examination of cows. Gynecological examination of mares. Gynecological examination of carnivores. Gynecological examination of small ruminants. Ultrasonographic examination of the reproductive tract in large and small animals. Pregnancy diagnose in cows and mares. Pregnancy diagnose in small animals. Laboratory techniques for pregnancy diagnoses. Preparation of the dam for parturition. Acceptation, handling and nursing of the neonate. Basic gynecological surgery procedures. Biotechnological methods for controlling the estrous cycle and ovulation. Biotechnological methods for controlling the parturition and lactation. Techniques for inducing superovulation. Implementation of ET and IVF. Obstetric instruments and preparation of the obstetrician. Reposition of irregular positions, assistance during parturition. Dam surgery. Techniques, equipment and procedures in uterine torsion. Clinical treatment of the dam during puerperium. Semen collection in breeding animals: preparation of artificial vagina, electro-ejaculation and other techniques. Macro- and microscopic evaluation of the semen. Determination of spermatozoa concentration. Techniques for determination of morphological features of the spermatozoa; supra-vital staining of the semen. Handling the deep frozen semen and AI instruments in cows. AI of cows. AI of small ruminants. AI of sows. AI of carnivores. AI of other species. Examination of mammary gland. Diagnoses of clinical and subclinical mastitis. Diagnoses, treatment and prevention of infertility in cows. Detection and suppression of the forms extragenital infertility. Diagnoses and treatment of infertility in ewes and does. Diagnoses and treatment of infertility in sows. Diagnoses and treatment of infertility in male animals. Diagnoses and treatment of infertility in mares. Diagnoses and treatment of infertility in carnivores.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: terrain and laboratory practicals and other ways of work with smaller groups (5-8 students). Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>375 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	VII semester Theory classes: 3 hours/per week (45 hours) Practicals: 4 hours/per week (60 hours) VIII semester Theory classes: 4 hours/per week (60 hours) Practicals: 5 hours/per week (75 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>105 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>135 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>135 hours</b>
<b>17.</b>	<b>Method of assessment</b>			

Points gained by student's activities:			
<i>Type of activity</i>		<i>Points</i>	
		<i>minimum</i>	<i>maximum</i>
Attendance on theory classes		5	10
Attendance and activity (knowledge) on practicals		10	20
Tests		10	20
Final exam		26	50
<b>Total:</b>		<b>51</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>For being able to reach the final exam student has to gain up to 40 points from theory classes and practicals and the tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Infectious diseases of domestic animals.</p>	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written            First test: Physiology of reproduction            Second tests: Endocrinology and control of reproduction</p> <p><b>Final exam:</b> oral  <b>Complete final exam:</b> oral + written (includes one periodical evaluation)</p>	
<b>22.</b>	<b>Textbooks</b>		
		<b>Mandatory</b>	
	<b>22.1</b>	Senger P. L., Pathways to Pregnancy and Parturition, 3rd Edition, 2012, Current Conceptions Inc. Noakes D., Parkinson T., England G., Veterinary Reproduction & Obstetrics, 10. Edition, 2018, Saunders Ltd. Hafez E. S. E., Hafez B., Reproduction in Farm Animals, 7th Edition 2013, Wiley-Blackwell Johnston S. D., Kustritz Margaret V. R., Schultz O. P., Canine and feline theriogenology, Saunders, 2001	
<b>22.2</b>	<b>Additional</b>		

	<p>Margaret V. Root Kustritz, Clinical Canine and Feline Reproduction: Evidence-Based Answers, John Wiley &amp; Sons, 2009</p> <p>Ball P.J.H., Peters A.R. Reproduction in Cattle, Third Edition, 2004, Blackwell Publishing</p> <p>Mark McEntee, Reproductive Pathology of Domestic Mammals, Elsevier Science, 2012</p> <p>Otto Radostits Clive Gay Kenneth Hinchcliff Peter Constable, Veterinary Medicine, 10th Edition, Saunders Ltd. 2006</p>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	General surgery with anesthesiology		
2.	Code	FVM413		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/winter semester	ECTS credit points	6.0
8.	Teacher	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD		
9.	Preconditions	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	Program course goals (competencies):	<p><b>A place that course occupies in veterinary education:</b> This course should stimulate the students for application of previously acquired knowledge of anatomy, pathology, pathophysiology and pharmacology for diagnosis of surgical diseases, handling the surgical patients and providing suitable anesthesia and intensive care for critical patients.</p> <p><b>Aim of the course:</b> To enable the student for independent work in daily animal practices. Thereby, student examines the animals, establishes diagnosis and performs conservative and operative treatment of surgical and orthopedic diseases. Particular attention is given to the practical side of the anesthesiology and intensive care.</p> <p><b>Relations of the course with previous and future education:</b> The course is closely related with all preclinical courses, especially Anatomy of animals, Pathology and Microbiology and represents a requirement for dealing with clinical patients.</p>		
11.	<b>Brief content</b> <b>Theory classes</b> <i>General surgery:</i> Introduction to surgery and surgical nomenclatures. Mechanisms and effects (influence) of trauma. Local tissue response to trauma or surgery. Wound and traumatic injuries. Wound healing. General operative procedures. Principles of aseptic surgery. Celiotomy. Bleeding and hemostasis. Preoperative assessment of surgical patients and monitoring during surgery. Postoperative care, wound infection and antimicrobial prophylaxis. Nutritional management of the patient. Disease of the ear and intengumentary system. Principle of plastic and reconstructive surgery. Hernias. Peritonitis. Basic surgical oncology procedures. <i>Fundamentals of anesthesiology:</i> General anesthetic principles. Analgesia. Anesthetic management. Anesthetic monitoring. Premedication. General anesthesia. Inhalation anesthesia. Anesthetic systems and equipment. Peri-operative anesthetic complications and emergency situations. Specific anesthetic protocols. Local anesthesia. Fluid therapy. CPR. Euthanasia. <b>Practicals</b>			

	Methods of physical and chemical patient restraint. Basic clinical procedures. Implementation of asepsis and antisepsis in surgery. Preoperative examination and patient evaluation. Desmiurgy. Introduction and handling with surgical instruments. Basic suture materials. Tissue suture placement. Treatment of surgical patient. Pain control. Anesthesiology – practical lectures.				
<b>12.</b>	<b>Methods of studying</b> Introduction the student with fundamentals of veterinary surgery and anesthesiology through interactive teaching based on interactive theoretical exposure of the material, discussions and preparation of seminars that encourage independent work of students, individually or in groups. Practicals comprise of work in a smaller groups by exposing the fundamentals of anesthesiology and surgical treatment of patients in order to gain practical knowledge of basic surgical methods and techniques.				
<b>13.</b>	<b>Total available time</b>	<b>150 hours</b>			
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 4 hours/per week (60 hours)			
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>60 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>60 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			<b>Attendance on theory classes</b>	<b>2</b>	<b>5</b>
			<b>Attendance and activity on practicals</b>	<b>5</b>	<b>10</b>
			<b>Test on general surgery</b>	<b>15</b>	<b>30</b>
			<b>Test on anesthesiology</b>	<b>9</b>	<b>15</b>
		<b>Practical exam</b>	<b>20</b>	<b>40</b>	
		<b>Total:</b>	<b>51</b>	<b>100</b>	
		<i>Final exam (option)</i>	<i>24</i>	<i>45</i>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	

19.	<b>Requirement for signature and taking the final exam</b>		<b>Attendance at theory classes and practicals</b> participates with <b>15%</b> . Students, who attend less than 30% of total <b>theory classes</b> , will not receive any points. Attendance between 30-60% brings 2.5 points, while the attendance in more than 60% of theory classes carries 5 points. Students that attended on less than 40% of <b>practicals</b> will not receive any points. Attendance between 40-70% at practicals carries 5 points, while attendance in more than 70% brings 10 points.
20.	<b>Teaching language</b>		<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Test on general surgery</b> participates with <b>30%</b> in grade formation. (Rule: it will be held one week after the classes are finished). Test with less than 50% correct answers will not be considered in further calculation.</p> <p><b>Test on anesthesiology</b> participates with <b>15%</b> of total points. (Rule – it will be held one week after the block classes of anesthesiology). Test with less than 50% correct answers will not be considered in further calculation.</p> <p><b>The practical exam</b> participates with <b>40%</b> of total points and is a requirement in final grade formation.</p> <p><b>Attendance at theory classes and practicals</b> participates with <b>15%</b>.</p> <p>Student gains grade mark for every part of the exam, according criteria noted in tests and practical exam. For point calculation, the gained grade mark is multiplied with appropriate final grade mark ratio and divided with 10, which gains the points from particular parts of the exam. The final grade mark is calculated as a sum of points from tests and practical exam, with adding of points gained with attendance at theory classes and practicals.</p> <p>Students who did not gained positive grade mark from both tests or are not satisfied with their test results, can reach the final exam. In that case, points from the tests are not included. The tests are realized in strictly scheduled term. They can be reached only twice, after that the course must be re-enrolled. Further terms for tests are published at the start of the exam sessions.</p>
22.	<b>Textbooks</b>		
	22.1	<b>Mandatory</b>	

		<ol style="list-style-type: none"> <li>1. Slatter Douglas, <i>Textbook of small animal surgery</i> 3rd edition, 2003, Saunders;</li> <li>2. Fossum Theresa W., <i>Small animal surgery</i> 5th ed., 2019, Mosby;</li> <li>3. Karen M. Tobias and Spencer A. Johnston, <i>Veterinary Surgery: Small Animal: 2-Volume Set 1st Edition</i>;</li> <li>4. Michael M. Pavletic, 4th ed. 2018, John Willey &amp; Sons, <i>Atlas of Small Animal Wound Management and Reconstructive Surgery</i>;</li> <li>5. Thurmon J.C., Tranquilli W.J., Benson G.J.Lumb &amp; Jones <i>Veterinary Anesthesia</i> 3rd edition. 1996, Williams &amp; Wilkins;</li> <li>6. Perimatei D., Flo G., DeCamp C. <i>Small animal orthopedics and fracture repair, 5<sup>th</sup> ed.</i> 2015, Saunders;</li> <li>7. Harari J. <i>Small animal surgery</i> 1996 Williams &amp; Wilkins;</li> <li>8. Swaim S., Henderson R. <i>Small animal wound management</i> 1990 Williams &amp; Wilkins;</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Infectious diseases of domestic animals		
2.	Code	FVM414		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/summer semester, fifth year/winter semester	ECTS credit points	9.5
8.	Teacher	Ass. Prof. Kiril Krstevski, PhD		
9.	Preconditions	Completed all courses from V to VII semester. Realized extra mural practice in III year.		
10.	Program course goals (competencies):	Introducing the students with characteristics of the infectious diseases, and the techniques for their diagnostics and control.		
11.	Brief content	<p><i>Theory classes and practicals</i></p> <p>Foot and mouth disease, swine vesicular disease, vesicular stomatitis, vesicular exanthema of swine, bovine papular stomatitis. Rinderpest, african horse sickness, bluetongue disease, bovine malignant catarrhal fever. Measles in all species, pseudocowpox, lumpy skin disease, ecthyma contagiosum in sheep and goats (orf), bovine mammillitis. Classical swine fever, african swine fever. Q fever, Rift Valley fever, West Nile fever, heartwater. Morbus maculosus in cattle, bovine ephemeral fever, infectious keratoconjunctivitis (pink eye) in cattle, sheep and goat. Transmissible gastroenteritis in swine, porcine epidemic diarrhea, swine dysentery (<i>Treponema</i>). Bovine viral diarrhea and mucosal disease in cattle, contagious bovine pleuropneumonia, contagious caprine pleuropneumonia, contagious pleuropneumonia in sheep and horse. Swine pleuropneumonia caused with actynobacillus and mycoplasma. Equine influenza, bovine parainfluenza, swine influenza, adenoviral respiratory infections, rhinoviral infections, reoviral infections, pneumococcoses. Infectious bovine rinotracheitis / infectious pustular vulvovaginitis (IBR/IPV), equine coital exanthema, infectious vaginitis in cattle,</p>		

	equine infectious anemia. Aujeszky's disease, infectious porcine encephalomyelitis. Bovine spongiform encephalopathy, scrapie, looping ill in sheep, rubies. Anthrax, pasteurellosis, atrophic rhinitis in pigs, leptospyrosis, salmonellosis, lysteriosis. Erysipelas in swine, Glasser's disease in swine. Coli-infection in calves and piglets, coli enterotoxemia, edema disease in swine. Clostridial diseases (gas-gangrene group and toxemias): blackleg, malignant edema, bradsot, enterotoxemias, tetanus and botulism. Tuberculosis, paratuberculosis (Johne's disease), pseudotuberculosis, actinomycosis, botryomycosis. Brucellosis in cattle, sheep/goat, swine, horse, carnivores, poultry, humans. Ovine foot rot, necrobacillosis. Mastitis, contagious agalactia in sheep and goat, gangrenous mastitis in sheep and goat. Porcine reproductive and respiratory syndrome, parvoviral infection in swine. Contagious ( <i>Campylobacter</i> ) abortion in sheep and cattle, enzootic abortion in ewes (chlamydial infection). Mycoplasmosis in cattle, swine, sheep/goat, horse, carnivores and other animals. Maedi/visna and smaedi infection in sheep and goat. Leucosis (cattle, sheep, horse, swine, cat, dog and other species). Papillomatosis in cattle, goat, rabbit, horse, swine, dog and humans. Distemper, parvovirus in dog, infectious canine hepatitis, canine coronavirus infection, feline panleukopenia, feline infectious peritonitis.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups. Video presentations and discussion with active participation of the students. Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>237.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	VIII semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) IX semester Theory classes: 3 hours/per week (45 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>75 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>87.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
			<b>Points</b>	
	<b>Type of activity</b>		<b>minimum</b>	<b>maximum</b>
	Attendance on theory classes		<b>12</b>	<b>15</b>
	Attendance and activity on practicals		<b>12</b>	<b>15</b>
Tests (two)		<b>20</b>	<b>40</b>	
Final exam		<b>16</b>	<b>30</b>	
<b>Total:</b>		<b>60</b>	<b>100</b>	

18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	<p>For being able to reach the final exam student has to gain up to 40 points from theory classes and practicals and the two tests.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in companion animals and equines, Internal diseases in farm animals.</p>	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>Final exam:</b> written</p>	
22.	Textbooks		
	22.1	Mandatory	
		<ul style="list-style-type: none"> <li>– Radosits, O. M., C. C. Gay, K. W. Hinchcliff, P. D. Constable (2007): Veterinary Medicine, A A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats, 10th Ed. , W. B.Saunders.</li> <li><i>Internet pages :</i></li> <li>– <a href="http://www.cfsph.iastate.edu/DiseaseInfo/index.php">http://www.cfsph.iastate.edu/DiseaseInfo/index.php</a></li> <li>– Merck Veterinary Manual (<a href="http://www.merckvetmanual.com/mvm/index.jsp">http://www.merckvetmanual.com/mvm/index.jsp</a>)</li> <li>– DEFRA (<a href="http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/index.htm#a">http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/index.htm#a</a>)</li> <li>– FAO (<a href="http://www.fao.org">www.fao.org</a>)</li> <li>– Terrestrial Animal Health Code (<a href="http://www.oie.int/eng/normes/mcode/en_sommaire.htm">http://www.oie.int/eng/normes/mcode/en_sommaire.htm</a>)</li> <li>– Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (<a href="http://www.oie.int/eng/normes/mmanual/a_summry.htm">http://www.oie.int/eng/normes/mmanual/a_summry.htm</a>)</li> </ul>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Internal diseases in farm animals

2.	<b>Code</b>	<b>FVM415</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fourth year/winter, summer semester</b>	<b>ECTS credit points</b>	<b>11.0</b>
8.	<b>Teacher</b>	<b>Prof. Dine Mitrov, PhD</b> <b>Ass. Prof. Igor Djadjovski, PhD</b>		
9.	<b>Preconditions</b>	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	<b>Program course goals (competencies):</b>	<p><b>Theory classes and practicals</b> of the course Internal diseases in farm animals include disciplines from several fields of internal medicine of farm animals which will be presented to the students theoretically and practically. Practical education is performed on the field. It includes clinical examination, discussion on findings, making diagnosis and performing the treatment.</p>		
11.	<b>Brief content</b>	<p><b>Theory classes and practicals</b></p> <p><i>Internal diseases in cattle, sheep and goat:</i> Introduction, diseases of oral cavity, tongue, salival glands, pharynx, teeth and oesophagus. Disease of preentracles: Introduction, classification. Simple indigestion. Acid indigestion. Parakerathosis, Alkaline indigestion. Putrification of ruminal content. Traumatic indigestion. Ruminal meteorism. Omasum paresis. Vagal indigestion. Other diseases of preentracles. Diseases of abomasum. Intestinal inflammation. Winter dysentery. Neonatal calf diarrhea. Alimentary diarrhea in calves. Dislocation of abomasum. Intestinal intussusception. Intestinal incarceration and strangulation. Intestinal volvulus. Dilatation and torsion of caecum. Peritonitis. Diseases of liver. Diseases of pancreas. Diseases of respiratory organs: Nasal cavity, sinuses, larynx. Pulmonal congestion and edema. Pneumonia (bronchopneumonia, gangrenous, purulent, embolic and mycotic pneumonia). Enzootic pneumonia in calves. Viral pneumonia in calves and heifers. Diseases of cardiovascular system in ruminants. Diseases of urinary system – nephrosis, renal amyloidosis, nephritis (acute, chronic, purulent), bacterial pyelonephritis. Cystitis, bladder paralysis, chronic vesicular hematuria, urolythiasis. Diseases of blood and hematopoietic organs. Hemorrhagic diathesis. Diseases of spleen. Diseases of CNS. Metabolic disorders (metabolic osteopathy, rickets, osteomalacia). Ketosis. Puerperal paresis. Atypical puerperal paresis. Tetany. Microelement deficiency. Rickets. Osteomalacia. Alotriophagia. Hypovitaminoses and avitaminoses. Disorders of energetic metabolism. Diseases of locomotory system. Diseases of integument. General on intoxications. Intoxication with copper, zinc, mercury, lead and molybdenum. Intoxication with arsenic, selenium, caustic bases, table salt. Intoxication with urea, phosphorus, sulfur, chlorine, chlorinated hydrocarbons Intoxication with herbal poisons. Mycotoxicoses. Botulism. Intoxication with animal poisons. <i>Internal diseases in swine:</i> Diseases of digestive organs. Diseases of oral cavity, pharynx. Obstruction of oesophagus. Gastro-intestinal catarrhs. Gastric ulcer. Colibacillosis in piglets. Edema disease. Contagious gastroenteritis. Dysentery. Dislocation of intestine. Diseases of liver. Disease of respiratory organs: Rhinitis, atrophic rhinitis. Bronchitis. Pneumonia and pneumomycosis. Diseases of cardiovascular organs: Cardiac anomalies, heart stroke (heart attack). Diseases of urinary organs: Nephritis. Pyelonephritis. Cystitis. Urolythiasis. Diseases of blood and hematopoietic organs: Anemia. Hemoglobinemia, Hemoglobinuria. Diseases of CNS: sunstroke and heat stroke. Meningitis. Encephalitis. Paresis and paralysis. Otitis interna. Disorders in metabolism of macro- and microelements. Hypo- and avitaminosis. Ketosis. Hypoglycemia. Diseases of locomotory organs:</p>		

	Rheumatism. Myopathies. Inflammation of joints and synovial membranes. Disorders of integument: exemas, dermatitis. Exanthema. Dermatomycosis.																															
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.																															
<b>13.</b>	<b>Total available time</b>	<b>275 hours</b>																														
<b>14.</b>	<b>Organization of the course</b>	VII semester Theory classes: 3 hours/per week (45 hours) Practicals: 3 hours/per week (45 hours) VIII semester: Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours per week (45 hours)																														
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>90 hours</b>																												
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>																												
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																													
		<b>16.2</b>	<b>Individual tasks</b>																													
		<b>16.3</b>	<b>Self-directed learning</b>	<b>110 hours</b>																												
<b>17.</b>	<b>Method of assessment</b>																															
	<b>Points gained by student's activities:</b>																															
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>Minimum</i></th> <th><i>Maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>10</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>17</td> <td>22</td> </tr> <tr> <td>Written essay</td> <td>0</td> <td>8</td> </tr> <tr> <td>Tests</td> <td>10+10 (20)</td> <td>20+20 (40)</td> </tr> <tr> <td>Final colocvium</td> <td>5</td> <td>5</td> </tr> <tr> <td>Final exam</td> <td>0</td> <td>10</td> </tr> <tr> <td><b>Total</b></td> <td><b>52</b></td> <td><b>100</b></td> </tr> <tr> <td>Complete final exam</td> <td colspan="2"> <i>Grade mark/Points</i>  Six (6) / 20  Seven (7) / 25  Eight (8) / 31  Nine (9) / 38  Ten (10) / 45 </td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>Minimum</i>	<i>Maximum</i>	Attendance on theory classes	10	15	Attendance and activity (knowledge) on practicals	17	22	Written essay	0	8	Tests	10+10 (20)	20+20 (40)	Final colocvium	5	5	Final exam	0	10	<b>Total</b>	<b>52</b>	<b>100</b>	Complete final exam	<i>Grade mark/Points</i> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45	
<i>Type of activity</i>	<i>Points</i>																															
	<i>Minimum</i>	<i>Maximum</i>																														
Attendance on theory classes	10	15																														
Attendance and activity (knowledge) on practicals	17	22																														
Written essay	0	8																														
Tests	10+10 (20)	20+20 (40)																														
Final colocvium	5	5																														
Final exam	0	10																														
<b>Total</b>	<b>52</b>	<b>100</b>																														
Complete final exam	<i>Grade mark/Points</i> Six (6) / 20 Seven (7) / 25 Eight (8) / 31 Nine (9) / 38 Ten (10) / 45																															
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																												
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																												
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>																												
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>																												
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>																												
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>																												

19.	<p><b>Requirement for signature and taking the final exam</b></p>	<p>To get right to reach final exam, the student has to gain minimum 40 points from the attendance of theory classes and practicals, tests and final colocvium.</p> <p>If the student does not gain required minimum on the first test, he/she could not attend the second one.</p> <p>Students who did not passed the tests reach directly on complete final exam (if they have right to it).</p> <p>The complete final exam has written and oral part, and depending on the grade mark gained, the student gets appropriate points.</p> <p>Final exam can be attended by the students who had gained minimum 60 points from the attendance of theory classes and practicals, tests and final colocvium, but who want to get higher grade mark from one predicted according points gained.</p> <p>Final exam takes 10 points and correspondents with student's results. If the student's results are not corresponding with the grade mark wanted by the student, he/she keeps the grade mark got with previously gained points.</p> <p>Final colocvium is mandatory and it is performed practically on the farm.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry.</p>
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final gaining.</p> <p><b>Tests (two):</b> written</p> <p><b>Final exam:</b> written-oral</p> <p><b>Complete final exam:</b> oral + written</p>
22.	<b>Textbooks</b>	
	22.1	<p><b>Mandatory</b></p> <ol style="list-style-type: none"> <li>1. Merck Veterinary Manual.</li> <li>2. Large Animal Internal Medicine. Bradford P. Smith. 2008</li> <li>3. Veterinary Medicine 10<sup>th</sup> edition. Otto Radostits Clive Gay Kenneth Hinchcliff Peter Constable. 2006</li> <li>4. Diseases of Swine. Straw, B.E., Zimmerman, J.J., D'Allaire, S., Taylor, D.J. 2006</li> <li>5. Diseases of Swine. Zimmerman, J.J., Karriker, A.L., Ramirez, A., Schwartz, J.K., Stevenson, W.G. 2012</li> </ol>
	22.2	<b>Additional</b>

--	--

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Special surgery with orthopedics		
2.	Code	FVM416		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/ summer semester; Fifth year/ winter semester	ECTS credit points	10.0
8.	Teacher	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD		
9.	Preconditions	Completed all courses from V to VII semester. Realized extra mural practice in III year.		
10.	<p><b>Program course goals (competencies):</b></p> <p><b>A place that course occupies in veterinary education:</b> The course should provide implementation of previously acquired knowledge of diagnostic and treatment of surgical and orthopedic diseases in large and pet animals and horses.</p> <p><b>Aim of the course:</b> To enable the student for independent examination, diagnosis and performing the most common surgical interventions in large and pet animals and horses. Thereby, the students will be trained to perform surgical examination of the patients based on anamnesis, clinical findings and laboratory tests to establish the diagnose, to perform conservative and operative treatment of surgical and orthopedic problems in large and pet animals and horses and to carry out adequate postoperative care and prognosis for the final outcome. Training should develop skills for human and responsible treatment of the patients during manipulation and taming, proper relation and communication with the owners and colleagues.</p> <p><b>Relations of the course with previous and future education:</b> The course is closely related with all the preclinical courses, especially Anatomy of animals, Pathology and Microbiology and is a requirement for dealing with clinical patients.</p>			
11.	<p><b>Brief content</b></p> <p><b>Theory classes</b></p> <p><i>Surgery of companion animals and equines:</i> Surgery of the respiratory system. Surgery of the gastrointestinal system. Colic in horses – surgical treatment. Surgery of the perineum, rectum and anus. Surgical diseases of endocrine and hematopoietic system. Fundamentals of orthopedic surgery. Surgical diseases of locomotory system (companion animals and horses). Surgery of urogenital system.</p> <p><i>Farm animals surgery:</i> General principles in farm animal surgery. Surgery of the head and neck. Abdominal surgery. Surgery of the female urogenital system. Surgery of the male urogenital system. Surgery of the udder. Surgery of the locomotory system.</p> <p><b>Practicals</b></p> <p><i>Companion animals and equines:</i> Examination and surgical procedures of the head. Examination and surgical procedures of the gastrointestinal system. Surgery of the locomotory system. Surgery of the urinary system. Surgical procedures of the reproductive system. <i>Farm animals:</i> Approach and fixation techniques. Surgical procedures of the head. Surgical procedures of the gastrointestinal system.</p>			

	Surgical procedures of the urogenital system. Surgical procedures of the locomotory system. Surgery of the udder.																						
<b>12.</b>	<b>Methods of studying</b> Introduction with the performing of surgical techniques on different organic systems through interactive teaching based on theoretical exposure of the material, discussions and preparation of seminars that encourage independent work of students, individually or in groups. Practicals comprise a work in a smaller groups on surgical patient that will enable overcoming the techniques of surgical treatment with postoperative care, anesthesia and analgesia in surgical patients, providing intensive care and monitoring of critical patients.																						
<b>13.</b>	<b>Total available time</b>	<b>265 hours</b>																					
<b>14.</b>	<b>Organization of the course</b>	VIII semester Theory classes: 3 hours/per week (45 hours) Practicals: 4 hours/per week (60 hours) IX semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)																					
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>75 hours</b>																			
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>90 hours</b>																			
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																				
		<b>16.2</b>	<b>Individual tasks</b>																				
		<b>16.3</b>	<b>Self-directed learning</b>	<b>100 hours</b>																			
<b>17.</b>	<b>Method of assessment</b>																						
	Points gained by student's activities:																						
	<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>3</td> <td>5</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>5</td> <td>10</td> </tr> <tr> <td>Oral/written exam – companiona animals and equines</td> <td>25</td> <td>50</td> </tr> <tr> <td>Oral/witten exam – farm animals</td> <td>20</td> <td>35</td> </tr> <tr> <td style="text-align: right;"><b>Total:</b></td> <td><b>53</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	3	5	Attendance and activity (knowledge) on practicals	5	10	Oral/written exam – companiona animals and equines	25	50	Oral/witten exam – farm animals	20	35	<b>Total:</b>	<b>53</b>	<b>100</b>	
<i>Type of activity</i>	<i>Points</i>																						
	<i>minimum</i>	<i>maximum</i>																					
Attendance on theory classes	3	5																					
Attendance and activity (knowledge) on practicals	5	10																					
Oral/written exam – companiona animals and equines	25	50																					
Oral/witten exam – farm animals	20	35																					
<b>Total:</b>	<b>53</b>	<b>100</b>																					
	<i>Final exam (optional)</i>		55      85																				
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																			
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																			
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>																			
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>																			
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>																			
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>																			

19.	<b>Requirement for signature and taking the final exam</b>	<p>Students, who attend less than 30% of total <b>theory classes</b>, will not receive any points. Attendance between 30-60% brings 3 points, while the attendance in more than 60% of theory classes carries 5 points. Students that attended on less than 40% of <b>practicals</b> will not receive any points. Attendance between 40-70% at practicals carries 5 points, while attendance in more than 70% brings 10 points.</p> <p>For to be able to take final grade mark or to reach on final exam, student has to pass the exam of course General surgery with anesthesiology.</p>
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Oral/written exam – companion animals and equines</b> participates with <b>50%</b> in grade formation. (Rule: it will be held one week after the classes are finished). <b>Oral/written exam – farm animals</b> participates with <b>35%</b> of total points. (Rule – it will be held one week after the classes are finished).</p> <p><b>Attendance at theory classes and practicals</b> participates with <b>15%</b>.</p> <p>Students have opportunity to make one written essay, which takes maximum <b>5 points</b>.</p> <p>Student gains grade mark for every part of the exam, according criteria noted in both oral/written exams. For point calculation, the gained grade mark is multiplied with appropriate final grade mark ratio and divided with 10, which gains the points from particular parts of the exam. The final grade mark is calculated as a sum of points from both oral/written exams, with adding of points gained with attendance at theory classes and practicals.</p> <p>Students who did not gained positive grade mark from both oral/written exams or are not satisfied with their exam results, can reach the final exam. In that case, points from the oral/written exams are not included. Oral/written exams are realized in strictly scheduled term. They can be reached only twice, after that the course must be re-enrolled. Further terms for oral/written exams are published at the start of the exam sessions.</p>
22.	<b>Textbooks</b>	
	22.1	<b>Mandatory</b>

		<ol style="list-style-type: none"> <li>Slatter Douglas, <i>Textbook of small animal surgery</i> 3rd edition, 2003, Saunders;</li> <li>Fossum Theresa W., <i>Small animal surgery</i> 5th ed., 2019, Mosby;</li> <li>Karen M. Tobias and Spencer A. Johnston, <i>Veterinary Surgery: Small Animal: 2-Volume Set 1st Edition</i>;</li> <li>Michael M. Pavletic, 4th ed. 2018, John Wiley &amp; Sons, <i>Atlas of Small Animal Wound Management and Reconstructive Surgery</i>;</li> <li>Thurmon J.C., Tranquilli W.J., Benson G.J.Lumb &amp; Jones <i>Veterinary Anesthesia</i> 3rd edition. 1996, Williams &amp; Wilkins;</li> <li>Perimatei D., Flo G., DeCamp C. <i>Small animal orthopedics and fracture repair, 5<sup>th</sup> ed.</i> 2015, Saunders;</li> <li>Harari J.: <i>Small animal surgery</i> 1996 Williams &amp; Wilkins; Swaim S., Henderson R. <i>Small animal wound management</i> 1990 Williams &amp; Wilkins;</li> <li>Susan Fubini and Norm Ducharme: <i>Farm Animal Surgery</i>, 2nd Edition, 2016, Saunders;</li> <li>Dean A. Hendrickson and A. N. Baird: <i>Turner and McIlwraith's Techniques in Large Animal Surgery</i>, 4th Edition, 2013, Blackwell</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Hygiene and technology of meat, fish, eggs and honey		
2.	Code	FVM511		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter, summer semester	ECTS credit points	8.5
8.	Teacher	<b>Prof. Pavle Sekulovski, PhD</b> <b>Prof. Dean Jankuloski, PhD</b> <b>Ass. Prof. Sandra Mojsova, PhD</b> <b>Ass. Prof. Mirko Prodanov, PhD</b>		
9.	Preconditions	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	Program course goals (competencies):	<b>Theory classes</b> This course is intended to teach students the hygiene and control of meat production and processing from all food producing animal species. Overview of veterinary-sanitary control of fish, eggs and honey is also included. Students are also introduced with welfare principles during the transport, reception at slaughterhouse, rest in the lairage and human slaughtering. Requirements for slaughterhouses for various animal species and meat, fishm eggs and honey processing enterprises are also taught. Pre-mortal and post-mortal examination of food producing animals are elaborated as well as processes of muscle to meat conversion. Principles of meat preservation and processing a meat to different meat products. Overview of procedure and treatment of waste materials in slaughterhouses and animal product industry is also included. Technology of fish, eggs and honey products is also presented. <b>Practicals</b>		

	<p>Practical education is divided in laboratory part and field visits to different food processing enterprises. Laboratory practicals consist introduction of methods for determination of meat, fish, eggs and honey quality, as well as their products quality and practical performing of analyses. Field visits are predicted to introduce the students directly with slaughterhouses, animal slaughter, processing and grading of the carcasses. Students have the opportunity to perform pre-mortal and post-mortal examination of food producing animals and evaluate the safety of meat and organs. Also, field practice includes visits of meat processing premises where students get familiar with meat processing technology and procedures. It also includes visit of snail processing and honey processing premises.</p>			
<b>11.</b>	<p><b>Brief content</b>  <b>Theory classes</b>  Introduction. Animals and birds as a meat source. Enterprises for slaughtering and production of meat. From farm to slaughter. Slaughtering and processing. Post-mortem inspection. Anatomy, meat chemistry and quality. Conversion of muscles to meat. Meat industry by-products. Meat preservation and processing. Comminuted preformed not thermally processed meat products. Cured meat products. Thermal processed meat products. Thermal processed and cured meat products. Fermented sausages. Canned meat products. Dried and smoked meat products. Hygiene of poultry meat. Hygiene of game and rabbit meat. Hygiene of fish and fish products. Hygiene of crustaceans, molluscs, frogs and snails. Hygiene of eggs and egg products. Hygiene of honey and other bee products.  <b>Practicals</b>  Visit to cattle and pig slaughterhouse. Introduction to slaughterhouse properties and functioning from lairage to final product and treatment of sewage. Cattle – ante-mortem inspection, slaughter and carcass processing. Pigs – ante-mortem inspection, slaughter and carcass processing. Sheep – ante-mortem inspection, slaughter and carcass processing. Poultry slaughterhouse, bird reception, slaughter, processing. Post-mortem inspection of carcasses and organs. Evaluation of fitness for human consumption and specific risks to human and animal health. Carcass classification and meat categorization. Meat quality assessment. Visit to meat processing enterprise: processing technologies, control. Visit to snails processing enterprise. Visit to honey enterprise. Inspection of meat products. Inspection of fish and fish products. Inspection of eggs and egg products.</p>			
<b>12.</b>	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
<b>13.</b>	<b>Total available time</b>	<b>212.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	IX semester Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours) X semester Theory classes: 2 hours/per week (30 hours) Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>60 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>75 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	

		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>77.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	12	15
		Attendance and activity (knowledge) on practicals	24	30
		Written essay	5	10
		Tests (two)	10	20
		Final exam	9	25
		<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		<p>For being able to reach the final exam student has to gain up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in farm animals, Infectious diseases of domestic animals, Avian diseases, Veterinary toxicology, Biology and pathology of fish.</p>	
<b>20.</b>	<b>Teaching language</b>		<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: - general part  Second test: - special part</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral and written (includes one test)</p>	
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		

		<ol style="list-style-type: none"> <li>1. Gracey, J.F., Collins, D.S., Huey, R.J. (1999): Meat hygiene. 10th Edition. Harcourt Brace and Company.</li> <li>2. Herenda, D.C., D.A. Franco (1996): Poultry diseases and meat hygiene. Iowa State University Press,.</li> <li>3. Varnam, A.H., J.P. Sutherland (1995): Meat and Meat Products. Technology, Chemistry and Microbiology. First Edition. Chapman &amp; Hall.</li> <li>4. Infante Gill, J. and J. Costa Durao (1990): A Colour Atlas of Meat Inspection. Wolfe Publishing Ltd.</li> <li>5. (1992): Inedible Meat By-products. Advances in Meat Research. Volume 8, Pearson, A.M. and T.R. Dutson. Elsevier Applied Science. London and New York.</li> <li>6. Ninios, Lunden, Korkeala, Fredriksson-Ahomaa (2014) Meat Inspection and Control in the Slaughterhouse</li> </ol>
	22.2	<b>Additional</b>

Attachment No. 3		First, second and third cycle course program		
1.	Program course title	Hygiene and technology of milk		
2.	Code	FVM512		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter semester	ECTS credit points	4.5
8.	Teacher	<b>Prof. Pavle Sekulovski</b> <b>Prof. Dean Jankuloski</b> <b>Ass. Prof. Sandra Mojsova</b> <b>Ass. Prof. Mirko Prodanov</b>		
9.	Preconditions	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<b>Program course goals (competencies):</b> <i>Theory classes</i> Students should acquire competence for independent performance of professional duties in the field of veterinary-sanitary control of production, processing and trading of milk and milk products. They should be capable to apply profesional and scientific approved methods and skills. <i>Practicals</i> Laboratory practice consists of physic-chemical methods for evaluation of quality of milk and milk products. Students are learning to be capable to perform analyses and evaluate hygiene and quality of milk and milk products. Field trips consists of visits to dairy enterprises and practical training in technological processes of producing of milk and control of milk products safety.			
11.	<b>Brief content</b> <b>Theory classes</b> Milk in human nutrition. Morfology of mammary gland and lactation. Milk – composition and properties. Assesment of milk safety. Dairy microbiology. Hygiene of milk production. Dairy enterpises. Secondary processing of milk. Pasteurised and sterilised milk. Fermented milk products. Cheese. Butter. Canned milk. Ice cream and other milk products. <b>Practicals</b>			

	Sampling of milk, sensory evaluation of milk. Physical testing of milk. Confirmation of milk adulteration and determination of milk freshness. Determination of fat content. Determination of protein and dry matter content. Determination of milk pasteurization. Determination of residues presence in milk and milk products. Microbiological testing of milk and milk products. Counting of somatic cells and diagnostic of mastitis. Determination of microorganisms causing brucellosis and tuberculosis. Determination of cleanliness of milking machines. Sampling, sensory evaluation and chemical analyses of milk products. <i>Field visits</i> : Construction of dairy enterprises (facilities and equipment). Processing of milk into dairy products. Traditional dairy products production in bachilo.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>112.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>52.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	12	15
		Attendance and activity (knowledge) on practicals	24	30
		Written essay	5	10
		Tests (two)	10	20
		Final exam	9	25
		<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>			
	For being able to reach the final exam student has to gain up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.			

20.	Teaching language	English
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> oral  <b>Complete final exam:</b> oral and written (includes one test)  Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Physiology of animals, Nutrious, healing and poisonous plants, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in farm animals, Infectious diseases of domestic animals, Veterinary toxicology.</p>
22.	Textbooks	
	22.1	<p><b>Mandatory</b></p> <ol style="list-style-type: none"> <li>1. IDF (2001): Mastitis. Newsletter N° 24. Bulletin of the IDF.</li> <li>2. IDF (2001): Cheeses in all their Aspects. Bulletin of the IDF. N° 369/2001.</li> <li>3. IDF (2002): World Dairy Situation. Bulletin of the IDF. N° 378/2002</li> <li>4. IDF (2002): Health benefits and safety avaluation of certain food components. Bulletin of the IDF. N° 377/2002.</li> <li>5. IDF (2002): The implications of policy changes for the world dairy industry. Bulletin of the IDF. N° 376/2002.</li> <li>6. Early, R. (1992): The Technology of Dairy Products. Blackie, VCH Publishers, INC. Glasgow and London, 1992.</li> <li>7. Harbutt, Juliet (1998): The world encyklopedia of cheese. Annes Publishing Limites 1998.</li> </ol>
	22.2	<p><b>Additional</b></p>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Biology and pathology of fish		
2.	Code	FVM513		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter semester	ECTS credit points	4.0
8.	Teacher	Prof. Misho Hristovski, PhD		

9.	<b>Preconditions</b>	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<p><b>Program course goals (competencies):</b>  <i>Theory classes</i> of Biology and pathology of fish course as a main goal has to introduce students with the meaning of fishery and aquaculture in Republic of Macedonia, basics of ecology in aquatic ecosystems, basics of aquaculture and commercial production of the most important fish species, general diseases characteristics, viral, bacterial, fungal, parasitic, exotic and fish diseases with non-infectious etiology, roe diseases, larva and aquarium fish, fish biological enemies and pests, disease prevention and human protection of zoonoses, control measures and disease eradication and legal regulative for eradication of the most important fish diseases.  In this manner, the future doctor for veterinary medicine will be able to gain knowledge for recognition of the main clinical and pathomorphological changes of fish diseases, be capable for advising and applying proper medication for fish diseases, be capable for consulting for taking prevention measures including promotion of optimal health and aquacultural production.  <i>Practicals</i> of Biology and pathology of fish course has an aim to introduce students with: fish systematic, fish species in Republic of Macedonia, fish anatomy and physiology, practical aspects of intensive aquaculture, diagnosis of fish diseases and implementing preventive means, control, therapy and eradication of fish diseases.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  Fishery and aquaculture. Basics of the ecology in the aquatic ecosystems. Aquaculture. General characteristics of fish diseases. Viral fish diseases. Bacterial fish diseases. Mycotic fish diseases. Parasitic fish diseases. Diseases with non-infectious etiology. Exotic fish diseases and roe and larva diseases. Biological enemies and pests of fish and diseases of aquarium fish. Fish health prevention and related legislative.  <b>Practicals</b>  Fish taxonomy and fish species bred in Republic of Macedonia. Fish anatomy. Fish physiology. Practical aspects of intensive aquaculture. Basis of fish diseases diagnosis. Diagnosis of viral fish diseases. Diagnosis of bacterial fish diseases. Diagnosis of mycotic fish diseases. Diagnosis of parasitic fish diseases. Drugs application in fish. Fish vaccination. Visiting carp fish dirt pond. Visiting carp/trout fish cage pond. Visiting trout fish pond.</p>			
12.	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
13.	<b>Total available time</b>	<b>100 hours</b>		
14.	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	

		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>40 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
	<i>Type of activity</i>	<i>Points</i>		
		<i>minimum</i>	<i>maximum</i>	
	<b>Attendance on theory classes</b>	<b>12</b>	<b>15</b>	
	<b>Attendance on practicals</b>	<b>12</b>	<b>15</b>	
	<b>Written essay</b>	<b>6</b>	<b>10</b>	
	<b>First test</b>	<b>15</b>	<b>30</b>	
	<b>Second test</b>	<b>15</b>	<b>30</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		<p>With gaining up to 60 points from attendance on theory classes and practicals, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two periodical evaluations during the semester, or if he/she did not gained minimal 60 points.</p>	
<b>20.</b>	<b>Teaching language</b>		<b>English</b>	

21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> fishery and aquaculture, basics of ecology in aquatic ecosystems, aquaculture, general diseases characteristics, viral and bacterial fish diseases, fish systematic and fish species bred in R. Macedonia, fish anatomy and physiology, practical aspects of intensive aquaculture, basics of diagnosing fish diseases, diagnostic of viral and bacterial fish diseases.</p> <p><b>Second test:</b> mycotic and parasitic fish diseases, diseases with non-infectious etiology, exotic fish diseases, roe and larva diseases, biological enemies and pests of fish, aquarium fish diseases, fish health protection, and legal regulative, diagnosis of mycotic and parasitic fish diseases, drugs application in fish, fish vaccination.</p> <p><b>Complete final exam:</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<p><b>Textbooks</b></p>															
	<p><b>Mandatory</b></p>															
22.1	<p>1. Aquaculture: Principles and Practices, 2nd Edition, T. V. R. Pillay, M. N. Kutty  2. Aquaculture and Behavior, Felicity Huntingford, Malcolm Jobling, Sunil Kadri  3. Fish Pathology, 4th Edition, Ronald J. Roberts  4. Health Maintenance and Principal Microbial Diseases of Cultured Fishes, 3rd Edition, John A. Plumb, Larry A. Hanson  5. Fish Disease, Edward J. Noga</p>															
22.2	<p><b>Additional</b></p>															

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Forensic veterinary medicine and veterinary ethics
2.	Code	FVM514
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje

5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>		<b>Fifth year/ summer semester</b>	<b>ECTS credit points 3.5</b>
8.	<b>Teacher</b>		<b>Prof. Trpe Ristoski, PhD</b>	
9.	<b>Preconditions</b>		Completed all courses from V to VIII semester. Realized extra mural practice in IV year.	
10.	<p><b>Program course goals (competencies):</b>  The <i>theory classes</i> of the course Forensic veterinary medicine and veterinary ethics make a synthesis of all the previously absolved subjects in the veterinary studies. Special attention will be payed on the diseases from legal aspect, first of all the latency and the lasting of the disease. The ethics in this course is studied from the aspect of the moral and ethical behaviour of the veterinary doctor during the performance of their professional activity.  The <i>practicals</i> acquaint the student with the practical use of the law during everyday veterinary practice and at the same time acquaints the student with the codex of the veterinary-medicine ethics.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  Introduction and history of the forensic veterinary medicine. Courts (function and jurisdiction). Expertise, general and special methods. Professional malpractices. General pathomorphological changes. Common diseases caused by bacteria and viruses. Common diseases caused by parasites. Diseases and vices in equines. Diseases and vices at cattle, sheep and goats. Diseases and vices at pigs and dogs. Diseases and vices in poultry, bees and other animals. General terms in the ethics, deontology, origin and historical development of the medical ethics. Ethical and deontological princips in the veterinary profession and veterinary medicine. Protection of the animal rights and animal welfare. Codices of the veterinary medicine ethics.</p> <p><b>Practicals</b>  Law on obligations. Law on lawsuit. Legal liabilities (crimes, summary offences, economic liabilities). Necropsy of domestic animals (theory). Necropsy of domestic animals (practical). Professional malpractices. Forensic evaluation of the disease with common bacterial and viral etiology. Forensic evaluation of the diseases in cattle, sheep and goats. Forensic evaluation of the diseases in equines and pigs. Forensic evaluation of the diseases in poultry. Forensic evaluation of the diseases in bees and other animals. Necropsy of the animals with forensic evaluation of the material vices in corpses and organs from dead and slaughtered animals</p>			
12.	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: discussion on particular court cases.  Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.</p>			
13.	<b>Total available time</b>		<b>87,5 hours</b>	
14.	<b>Organization of the course</b>		Theory classes: 2 hours/per week (30 hours) Practicals: 1 hour/per week (15 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>

16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	52.5 hours
17.	Method of assessment			
	Points gained by student's activities:			
			<i>Points</i>	
	<i>Type of activity</i>		<i>minimum</i>	<i>maximum</i>
	Attendance on theory classes		12	15
	Attendance and activity (knowledge) on practicals		24	30
	Written essay		5	10
Tests (two)		10	20	
Final exam		9	25	
Total:		60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)
			from 51 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)
			from 71 to 80 points	8 (eight) (C)
			from 81 to 90 points	9 (nine) (B)
			from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam		<p>For being able to reach the final exam student has to gain up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam. The final exam is mandatory.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in companion animals and equines, Internal diseases in farm animals, Infectious diseases in domestic animals, Reproduction, General surgery with anesthesiology, Special surgery with orthopedics, Ophthalmology, Veterinary toxicology, Veterinary epidemiology, Avian diseases, Biology and pathology of fish, Biology and pathology of bees, Biology and pathology of game, Hygiene and technology of meat, fish, eggs and honey, Biology and pathology of milk, Food safety and veterinary public health, Veterinary legislative.</p>	
20.	Teaching language		English	

21.	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Introduction and history of the forensic veterinary medicine; Courts (function and jurisdiction); expertise, general and special methods; Professional malpractices; General pathomorphological changes; Common disease caused by bacteria and viruses and common disease caused by parasites..</p> <p><b>Second test:</b> Diseases and vices in equines; Diseases and vices in cattle; Diseases and vices in goats and sheep; Diseases and vices in pigs; Diseases and vices in dogs; Diseases and vices in poultry, bees and other animals; Veterinary medicine ethics.</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral + practical</p>
22.	<b>Textbooks</b>		
	22.1	<b>Mandatory</b>	
		<ol style="list-style-type: none"> <li>1. Kumar, Cotran, Robbins: Basic Pathology. 7 edition, 2003.</li> <li>2. Jubb K., Kenedy P., Plamer N.: Pathology of domestic animals. 4-1992.</li> </ol>	
	22.2	<b>Additional</b>	

Attachement No. 3	First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Basis of management with management of veterinary practice</b>	
2.	<b>Code</b>	<b>FVM515</b>	
3.	<b>Study program</b>	<b>Veterinary medicine</b>	
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>	
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>	<b>Fifth year/ summer semester</b>	<b>ECTS credit points 3.5</b>
8.	<b>Teacher</b>	<b>Prof. Blagica Sekovska, PhD</b>	
9.	<b>Preconditions</b>	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.	
10.	<b>Program course goals (competencies):</b> <b>Theory classes</b> This course has aim to introduce the student with basic knowledge from the field of management. This includes ability for planning, organization, leadership and other so-called “soft” or “life” skills. To solve these skills it is necessary to have concioussnes for interaction existing between doctor of		

	<p>veterinary medicine and social community. Also, very high priority is the ability for working in team, especially in multidisciplinary team. This course would obtain possibility for the student to become aware about his/her responsibility, ability for basic calculation of costs, ability for business planning and organization, recognizing the meaning of motivation of employees, ranging and compensation of the work, as well as importance of the health and safety of the employees, and entrepreneurship skills.</p> <p><b>Practicals</b> Practicals are to support of the theory classes for additional elaboration of some topics from practical aspect via various teaching methods as dramatization of some hypothetic situations and problem solving, elaboration of different techniques for strategic planning in veterinary practice as the SWOT analysis, PEST analysis and other kinds of strategic paining, making of business plan for veterinary practice, exercises with communication with clients etc.</p>			
<b>11.</b>	<p><b>Brief content</b> <b>Theory classes</b> Introduction. Planning and strategic planning. Organization of work as management and process. Communication in veterinary medicine. Building and working in team. Human resources. Managing veterinary practice. Client/customer service in veterinary practice. Rules for efficient working of veterinary practice. Veterinary practice as a economic paradigm.</p> <p><b>Practicals</b> Making SWOT analysis. Strategic planning. Organization of veterinary practice. Communication with the client. Team-building. Human resources. Basic aspects of marketing in veterinary practice. Making of business plan. Managing.</p>			
<b>12.</b>	<p><b>Methods of studying</b> Theory classes: interactive (lectures with discussion and active participation of the students). Practicals: practicals with dramatization of situation, case study, presentation of some teaching units by the students, discussion about topics of interest and other ways of work in smaller groups Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.</p>			
<b>13.</b>	<b>Total available time</b>	<b>87.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>42.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			

		Points gained by student's activities:		
		Type of activity	Points	
			minimum	maximum
		Attendance on theory classes	16	22
		Attendance and activity (knowledge) on practicals	16	22
		Written essay	6	16
		Tests (two)	11(x2)=22	20(x2)=40
		Final exam	Optional	
		<b>Total:</b>	<b>60</b>	<b>100</b>
18.	Grading criteria (points/grade)	до 60 бода	5 (five) (F)	
		од 61 до 68 бода	6 (six) (E)	
		од 69 до 76 бода	7 (seven) (D)	
		од 77 до 84 бода	8 (eight) (C)	
		од 85 до 92 бода	9 (nine) (B)	
		од 93 до 100 бода	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test.		
20.	Teaching language	English		
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> on student's request  <b>Complete final exam:</b> on student's request  Final exam is predicted on request of the student if he/she want to gain grade mark higher than one which was gained with his/her previous activities. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.</p>		
22.	Textbooks			
	22.1	Mandatory		
		<ol style="list-style-type: none"> <li>1. Tomas E. Catanzaro, Philip Seibert: Veterinary practice management secrets, Philadelphia, 2000</li> <li>2. Mark Opperman at all: The Art of Veterinary Practice Management , 2014</li> </ol>		
22.2	Additional			
		Current web-pages recommended by the course teacher		

1.	<b>Program course title</b>		<b>Veterinary epidemiology</b>	
2.	<b>Code</b>		<b>FVM516</b>	
3.	<b>Study program</b>		<b>Veterinary medicine</b>	
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>		<b>Faculty of Veterinary Medicine - Skopje</b>	
5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>		<b>Fifth year/ winter semester</b>	<b>ECTS credit points</b>   <b>2.0</b>
8.	<b>Teacher</b>		<b>Ass. Prof. Kiril Krstevski, PhD</b>	
9.	<b>Preconditions</b>		Completed all courses from V to VIII semester. Realized extra mural practice in IV year.	
10.	<b>Program course goals (competencies):</b> The aim of this course is to introduce the students with meaning and importance of the quantitative analysis of some disease in the population, as a addition to the knowledge about its etiology, diagnostics and control, both for particular animals and herds. Students would became related with elemental knowledge about main principles and analytical techniques used in the epidemiological studies.			
11.	<b>Brief content</b> <b>Theory classes and practicals</b> Introduction. Development of veterinary medicine. Objectives of the veterinary epidemiology. Concepts and principles in veterinary epidemiology. Description of the disease outbreak. Field researching. Observation studies. Diagnostic testings. Clinical investigations. Comparative epidemiology. Economy of diseases. Health schedules. Control and eradication of diseases.			
12.	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay. Performance of the computer simulation, i.e. solving tasks from the practical veterinary epidemiology. The tasks are in a written form, and solutions are found with computer, with use of WIN EPISCOPE 2.0 software.			
13.	<b>Total available time</b>		<b>50 hours</b>	
14.	<b>Organization of the course</b>		Theory classes: 1 hour/per week (30 hours) Practicals: 1 hour/per week (30 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>20 hours</b>
17.	<b>Method of assessment</b>			

Points gained by student's activities:			
<i>Type of activity</i>	<i>Points</i>		
	<i>minimum</i>	<i>maximum</i>	
Attendance on theory classes	12	15	
Attendance and activity (knowledge) on practicals	23	30	
Written essay	0	5	
Tests (two)	10	20	
Final exam	15	30	
Complete final exam	<i>Grade mark</i>	<i>Points</i>	
	Six(6)	20	
	Seven (7)	25	
	Eight (8)	30	
	Nine (9)	35	
	Ten (10)	43	
<b>Total:</b>	<b>60</b>	<b>100</b>	
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	<p>For being able to reach the final exam student has to gain up to 40 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in companion animals and equines, Internal diseases in farm animals, Infectious diseases in domestic animals.</p>	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>Final exam:</b> written-oral</p> <p><b>Complete final exam:</b> oral</p> <p>If student during tests did not show result on one of the tests, but has gained points on theory classes and practicals, he/she has to go on complete final exam.</p>	
22.	Textbooks		

		<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>Marc Stevenson: An Introduction to Veterinary Medicine, EpiCentre, IVABS, Massey University, New Zeland, 2005</li> <li>Michael Thrusfield: Veterinary Epidemiology, Blackwell Science, 2007</li> </ol>	
	22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Veterinary toxicology		
2.	Code	FVM517		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth Year/ winter semester	ECTS credit points	2.0
8.	Teacher	Prof. Romel Velev, PhD		
9.	Preconditions	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	Program course goals (competencies):	<p><i>Theory classes</i> of the course Veterinary toxicology aim to introduce students with the main principles of veterinary toxicology: the structure, the way action and pharmacokinetics of toxic substances, pathogenesis, clinical diagnosis and treatment of poisoned animals, ethical, environmental implications and implications on human health from use of potential toxic substances; evaluation of products of animal origin contaminated with poisons and others. For student can demonstrate knowledge and understanding of veterinary Toxicology as a basis for the study and practice of clinical veterinary Medicine.</p> <p>In this way the future doctor of veterinary medicine will be possible to acquire: knowledge to identify the indications for medical intervention in poisoning; ability to provide advice and application of appropriate treatment of poisoning in individual life or group of animals, ability to give advice on preventive veterinary medicine, including promoting optimal health and production.</p> <p><i>Practicals</i> of the course Veterinary toxicology aim to introduce students with: different groups of poisons and their characteristics; possible sources poisoning; procedure poisoned animals and antidote, taking and sending material chemic-toxicological analysis; how safe storage and safe removal of poisons, and to illustrate some abstract theoretical concepts through simple laboratory experiments.</p>		
11.	Brief content	<p><b>Theory classes</b></p> <p><i>General toxicology</i>: Introduction. Definition of poison and terminology. Classification of poisons. Toxokynetics of poisons. Toxodynamic of poisons. Fundamentals of poisoning and treatment in</p>		

	domestic animals. <i>Special toxicology</i> : Pesticides: insecticides, rhodenticides, fungicides, herbicides and lymacides. Metals. Industrial pollutants. Nitrogen compounds. Biotoxins (mycotoxins). Poisonous plants. <b>Practicals</b> Procedure with poisoned animal. Sampling and sending material for chemical-toxicological examination. Evaluation of safety of animal products from the poisoned animal. Antidotes in veterinary toxicology. Estimations in toxicology. Analytical and instrumental methods in veterinary toxicology. Visit of laboratory for control and examination of drugs and introducing with equipment used in veterinary pharmacology and toxicology.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
			<i>Points</i>	
	<i>Type of activity</i>		<i>minimum</i>	<i>maximum</i>
	Attendance on theory classes		12	15
	Attendance and activity (knowledge) on practicals		24	30
	Written assay		5	10
	Tests (two)		10	20
Final exam		9	25	
<b>Total:</b>		<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	For being able to pass the final exam student has to gain up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam. Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology.
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: General toxicology Second test: Special toxicology <b>Final exam:</b> oral <b>Complete final exam:</b> oral + written (includes one test)
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	1. Ramesh C. Gupta: Veterinary Toxicology Basic and Clinical Principles, Elsevier Third Edition 2018. 2. Course materials (lecture handouts and notes) will be provided for every students (LMS)
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Ophthalmology</b>		
2.	<b>Code</b>	<b>FVM518</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fourth year/ winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Plamen Trojachanec, PhD</b> <b>Ass. Prof. Ksenija Ilievska, PhD</b>		

9.	<b>Preconditions</b>	Passed all courses from I to IV semester, including Pathophysiology and Pathology. Realized extra mural practice in III year.		
10.	<p><b>Program course goals (competencies):</b>  <b>Place the course occupies in veterinary education:</b> The course should encourage the students to apply their previously acquired knowledge of clinical anatomy, pathology, pathophysiology and pharmacology for diagnostics and treatment of ophthalmic diseases and fundamental treatment of ophthalmic patient.  <b>Aim of the course:</b> To enable the student for individual work in daily practice. In addition, student can perform individual examination, diagnosis and conservative or operative treatment of ophthalmic diseases.  <b>Relations of course with previous and future education:</b> The course is closely related with preclinical courses, especially Anatomy of animals, Pathology, Physiology of animals and General surgery with anesthesiology.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes and practicals</b>  Anatomy of the eye. Basic principles of ophthalmic disease. Diseases of palpebrae, conjunctiva and lachrymal system. Diseases of the eye globe and orbit. Diseases of the cornea. Diseases of the uveal tract. Diseases of the lens and vitreous. Diseases of the retina and optic nerve. Disorders influenced by intraocular pressure. Specific ophthalmological diseases. Clinical examination and handling the ophthalmic patient.</p>			
12.	<p><b>Methods of studying</b>  Introduction with fundamentals of veterinary ophthalmology through interactive teaching based theoretical exposure of the material, discussions and preparation of written essay to encourage the students for independent work, individually or in small groups.  Practicals comprises of work in smaller groups that will enable overcoming the practical knowledge of essential ophthalmology methods and techniques.  Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals 1 hour/per week (15 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>20 hours</b>
17.	<b>Method of assessment</b>			

		Points gained by student's activities:		
		Type of activity	Points	
			minimum	maximum
		Attendance on theory classes	5	10
		Attendance and activity on practicals	2.5	5
		Written essay	0	5
		Test	50	85
		<b>Total:</b>	<b>50</b>	<b>100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	
		from 61 to 70 points	7 (seven) (D)	
		from 71 to 80 points	8 (eight) (C)	
		from 81 to 90 points	9 (nine) (B)	
		from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Students, who attend less than 40% of <b>total theory classes</b> , will not receive any points. Attendance between 40-70% brings 5 points, while the presence in more than 70% carries 10 points. Students, who attend less than 40% of <b>practicals</b> , will not receive any points. Attendance between 40-70% brings 2.5 points, while the presence in more than 70% carries 5 points.		
20.	Teaching language	<b>English</b>		
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>The test on ophthalmology</b> participates with <b>85%</b> in grade formation. (Rule: it will be held one week after the lectures). Test with less than 50% correct answers will not be considered in further calculation.</p> <p><b>Attendance at theory classes</b> participates with <b>15%</b>. The students have an opportunity to prepare a written essay, which brings up to <b>5 points</b>.</p> <p>The tests are performed at precisely given date and are required for all the students. The tests can be taken up to three times, after which the course is re-enrolled. Terms for the exam will be announced at the beginning of the test sessions.</p> <p>Summary of the test score, theory classes and practicals attendance establishes the final grade.</p>		
22.	Textbooks			
	22.1	Mandatory		
		<ol style="list-style-type: none"> <li>1. Kirk N. Gelatt: <i>Essentials of Veterinary Ophthalmology</i>, 3<sup>rd</sup> ed. 2014, Blackwell;</li> <li>2. David Maggs, Paul Miller and Ron Ofri: <i>Slatter's Fundamentals of Veterinary Ophthalmology</i>, 6th ed. 2018, Elsevier;</li> <li>3. Simon M. Peteresen-Jones and Sheila M. Crispin: <i>Manual of Small animal ophthalmology</i>, 2002, BSAVA</li> </ol>		
22.2	Additional			

--	--

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Herd health management		
2.	Code	FVM519		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter semester	ECTS credit points	2.0
8.	Teachers	<b>Prof. Toni Dovenski, PhD</b> <b>Prof. Plamen Trojachanec, PhD</b> <b>Prof. Dine Mitrov, PhD</b> <b>Ass. Prof. Branko Atanasov, PhD</b> <b>Ass. Prof. Ksenija Ilievska, PhD</b> <b>Ass. Prof. Irena Celeska, PhD</b>		
9.	Preconditions	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<b>Program course goals (competencies):</b> The aim of the course Herd health management (HHM) is to familiarize students with the basic principles of managing herd health and production of livestock farms, as a separate veterinary service that is geared towards maximum expression of genetic potential of individual animal and the herd as a whole, by optimizing farm management and the overall position of the farm, consequently farm income. The student will need to know the principles of HHM, the way of setting the objectives and systematic strategies, record keeping, organize visits to farms under determined protocol, to be close to the epidemiological and economic aspects of the HHM; as well as to know the principles of monitoring and management of dry off period, milk production and metabolic diseases, reproductive performance, udder health, hoof health, control of infectious diseases. In this way the future doctor of veterinary medicine will be allowed to acquire knowledge of management of the health of the herd in order to assist farmers in optimizing health, production and welfare of the animals in the herd. <i>Practicals</i> of the course have the task to train future DVM independently to manage the herd health and production on a farm, taking into account the individual segments of this process such as the management of reproduction, milk production, health of the hoof and udder, metabolic and infectious diseases, management of dry off period and overhaul of the herd. All this should be accomplished through practical exercises for setting the goals of the farm, training for proper record keeping and organizing visits to farms, perform the necessary clinical and laboratory testing, analysis and decision making based on information collected and finally monitoring the effects of the recommended intervention			
11.	<b>Brief content</b> <b>Practicals</b> Basic principles, objectives and systematic strategies. Monitoring of the herd overhaul. Monitoring the management in dry off period. Monitoring of the milk production. Monitoring the reproductive performance. Monitoring of the udder health. Monitoring of the hoof health. Control of infectious diseases.			
12.	Methods of studying			

	Practicals: practical work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>65 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Practicals: 3 hours/per week (45 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>45 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on practicals	10	15
		Activity (knowledge) on practicals	25	30
	Written essay (report)	5	10	
	Test	20	45	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>For being able for gaining final grade mark, the student has gain up to 35 points from attendance on practicals, to prepare one written essay and to show appropriate activity and knowledge on the practicals.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in farm animals, Infectious diseases in domestic animals, Reproduction.</p>		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Test:</b> oral, during the practical work. <b>Written essay:</b> preparation of a report for certain condition in the herd, with recommendation for corrective activities.
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	1. Brand A., J.P.T.M. Noordhuizen, Y.H, Schukken, 1997, Herd Health and Production management in dairy practice, Wageningen Pers, The Netherland 2. Radostits O.M., Leslie K.E., Fetrow J., Herd Health - Food Animal Production Medicine , 2. edition., W.B. Saunders Company.
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Veterinary legislative</b>		
2.	<b>Code</b>	<b>FVM520</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Elena Davtikovska, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<b>Program course goals (competencies):</b> <b>Definition of the course:</b> The course Veterinary legislative is studying veterinary legislation and everything connected to the organization and activities of the veterinary profession. <b>Position the course in veterinary education:</b> Veterinary profession is legally regulated profession. For all segments of its activities, there are national and international systems, laws and standards. Through studies of Veterinary legislative students are introduced to them, in order to be able to successfully engage in the work of various systems and areas covered by the veterinary medicine. <b>Relation of the course with previous and future education:</b> The course Veterinary legislative binds the knowledge acquired by the student in other courses in the areas of animals health, food safety, veterinary medicinal products, animal feed, animal welfare, etc... The course is essential for the further education and acquiring the status of an official and authorized veterinarian. <b>General objectives of the course:</b> The course objective of the Veterinary legislative to introduce both students, as future official and authorized doctors of veterinary medicine in the legal system of the state, the principles of veterinary international and national legislation, the organization of veterinary services in the world, in EU and in Republic of Macedonia.			

11.	<b>Brief content</b> <b>Theory classes</b> Introduction. Primary legislation. International veterinary organizations and standards. Organization and legislation in EU and harmonisation of Macedonian legislation. Macedonian national legislation in the field of veterinary medicine. <b>Practicals</b> Examples of carrying out general administrative procedure. OIE International Code of Terrestrial and Code of Aquatic Animals, Manual of Standards for Laboratory Diagnostic Methods and Biologicals. Notification of diseases under OIE system and WAHIS. Information system for animal health status worldwide. Examples of directives, regulations and decisions in the EU concerning the veterinary field. Documents and resources for identification and registration of animals. Health certificates and documents the movement of animals. International veterinary certificates. Veterinary documents and regulations in slaughterhouses, dairies, processing facilities and all areas subject to veterinary control. Transport of animals. Organization and documentation of measures covering annual program for animal health. Organization, duties and responsibilities for the implementation of multi-annual programs to combat various diseases. Visual teaching methods, screening of films using information from the internet.																										
12.	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practical: practicals and other ways of work with smaller groups, simulation of creating of particular legislative documents in the field of veterinary medicine. Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.																										
13.	<b>Total available time</b>	<b>50 hours</b>																									
14.	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practical: 1 hour/per week (15 hours)																									
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>																							
15.2		<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>																								
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>																								
16.2		<b>Individual tasks</b>																									
16.3		<b>Self-directed learning</b>	<b>20 hours</b>																								
17.	<b>Method of assessment</b> Points gained by student's activities: <table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>5</td> <td>10</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>5</td> <td>10</td> </tr> <tr> <td>Written essay</td> <td>5</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>30</td> <td>50</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Oral exam 20</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>				<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	5	10	Attendance and activity (knowledge) on practicals	5	10	Written essay	5	10	Tests (two)	30	50	Final exam	Oral exam 20		<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																										
	<i>minimum</i>	<i>maximum</i>																									
Attendance on theory classes	5	10																									
Attendance and activity (knowledge) on practicals	5	10																									
Written essay	5	10																									
Tests (two)	30	50																									
Final exam	Oral exam 20																										
<b>Total:</b>	<b>60</b>	<b>100</b>																									
18.	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																							
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																							

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with minimum 30 points.</p> <p>Final exam is oral. Student who did not pass one of the tests during the semester, goes to one of the corrective tests during the exam sessions.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in companion animals and equines, Internal diseases in farm animals, Infectious diseases in domestic animals, Reproduction, General surgery with anesthesiology, Special surgery with orthopedics, Ophthalmology, Veterinary toxicology, Veterinary epidemiology, Avian diseases, Biology and pathology of fish, Biology and pathology of bees, Biology and pathology of game, Hygiene and technology of meat, fish, eggs and honey, Hygiene and technology of milk, Food safety and veterinary public health.</p>	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test – general part: International standards in veterinary medicine and veterinary service organization at the international level: OIE, WTO SPS Agreement, <i>Codex alimentarius</i>. EU veterinary legislation (<i>Acquis comunitaire veterinaire</i>), institutions and organization of veterinary service in the EU and the process of harmonization of the Macedonian national legislation with the EU.</p> <p>Second test – special part: Constitution of the Republic of Macedonia, primary and secondary legislation, laws regulating the operation of administrative bodies, the Law on General Administrative Procedure. Macedonian national legislation in the field of veterinary medicine.</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> not predicted</p>	
<b>22.</b>	<b>Textbooks</b>		

	<b>Mandatory</b>	
<b>22.1</b>		<p>1. OIE Terrestrial Animal Health Code 27th Edition, 2018 ISBN 978-92-95108-58-5 (www.oie.int )</p> <p>2. OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 7th Edition, 2012 Volumes 1 and 2 ISBN 978-92-9044-878-5 (www.oie.int)</p> <p>3. WORLD ORGANISATION FOR ANIMAL HEALTH (OIE) SIXTH STRATEGIC PLAN FOR THE PERIOD 2016 – 2020 (www.oie.int )</p> <p>4. OIE Platform on Animal Welfare for Europe Action Plan for 2017 – 2019 (www.oie.int )</p> <p>5. European Parliament and the Council Regulation (EC) No 178/2002 laying down the general principles and requirements of food law (General Food Law Regulation). (http://europa.eu)</p> <p>6. Animal Welfare in the European Union I SBN 978-92-79-06722-8 (http://europa.eu)</p> <p>7. REGULATION (EU) 2016/429 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2016 on Transmissible Animal Diseases and Amending and Repealing Certain Acts in the Area of Animal Health ('Animal Health Law') (http://europa.eu)</p> <p>8. Regulation (EC) No 1760/2000 of the European Parliament and the Council (http://europa.eu);</p>
<b>22.2</b>	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Food safety and veterinary public health		
2.	Code	FVM521		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ summer semester	ECTS credit points	4.0
8.	Teacher	<b>Prof. Pavle Sekulovski, PhD</b> <b>Prof. Dean Jankuloski, PhD</b> <b>Ass. Prof. Sandra Mojsova, PhD</b> <b>Ass. Prof. Mirko Prodanov, PhD</b>		
9.	Preconditions	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	Program course goals (competencies):	<p><b>Theory classes</b></p> <p>The aim of this course is to introduce the students to the role of veterinary profession in food safety and veterinary public health. Students are taught food microbiology, food poisoning, food spoilage as well as European and national food legislation. Risk analysis and process control in food production with contemporary control systems. Role and duties of the official veterinarian in the control of spreading the diseases, hygiene of animals for slaughter, food processing and handling are explained. Longitudinal and integrated approach to the safe food production, animal welfare and influence of food to human health.</p> <p><b>Practicals</b></p> <p>Aim of the practicals is to train students to perform the duties of the official veterinarians. It includes all the official forms and documents used by the official veterinarians, sampling, packing and sending the samples to the official laboratory. Students are taught how to collect samples for the official</p>		

	monitoring programs for <i>Salmonella</i> , residues and contaminants in food of animal origin. Methods for testing of food and water microbiology are also included in this course. Knowledge gained during theory classes and practicals students will apply for creating and presentation of HACCP systems for food safety monitoring in various food industry enterprises.			
<b>11.</b>	<p><b>Brief content</b></p> <p><b>Theory classes</b> Introduction to food safety and veterinary public health. Basics of food microbiology. Microbiological spoilage of food. Foodborne infections and intoxications. Investigation of food outbreaks. European and national food legislation. Competent authority for food – veterinary and food inspection. Food chain and health hazards. Health hazards originating from the farms. Food hygiene and safety at retail and consumer level. Stable to table concept. PRP, SSOP, GHP, GMP. HACCP system. Risk assessment. Residues and contaminants in food. Process control: swab surface, water, cleaning and disinfection. Food production and environment protection.</p> <p><b>Practicals</b> Documentation used by official veterinarian. Sampling and sending samples to laboratory for laboratory testing of: control of process hygiene: surface swabs; safety of raw materials and final food products; water quality; national monitoring programs; antimicrobial resistance; Swabs – enumeration of enterobacteriaceae, aerobic plate count. Food and raw materials – microbiological methods for detection of <i>Salmonella</i>, <i>Listeria monocytogenes</i>, <i>Campylobacter</i> spp. <i>Yersinia enterocolitica</i>, <i>Staph. aureus</i>, <i>E. coli</i>. Water – membrane filtration methods, <i>Ps. aeruginosa</i>, <i>E. coli</i>, coliforms, intestinal enterococci, total viable count 22°C, and 37°C, determination of NO<sub>2</sub>, NO<sub>3</sub>, NH<sub>3</sub>. Sample preparation for detection of <i>Salmonella</i> spp., mycotoxins, pesticides, heavy metals, hormones. Antimicrobial substances – screening methods: Delvo test, Copan test, Four Plate Test and quantitative determination with HPLC. Elaboration of HACCP plan for: slaughterhouse for mammals, slaughterhouse for poultry, dairy, meat processing factory.</p>			
<b>12.</b>	<p><b>Methods of studying</b></p> <p>Theory classes: interactive (lectures in large group with discussion and active participation of the students).</p> <p>Practicals: practicals and other ways of work with smaller groups</p> <p>Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.</p>			
<b>13.</b>	<b>Total available time</b>	<b>100 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 2 hours/per week (30 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>40 hours</b>
<b>17.</b>	<b>Method of assessment</b>			

	<b>Points gained by student's activities:</b>																								
	<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on theory classes</td> <td>12</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>5</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>10</td> <td>20</td> </tr> <tr> <td>Final exam</td> <td>9</td> <td>25</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on theory classes	12	15	Attendance and activity (knowledge) on practicals	24	30	Written essay	5	10	Tests (two)	10	20	Final exam	9	25	<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																								
	<i>minimum</i>	<i>maximum</i>																							
Attendance on theory classes	12	15																							
Attendance and activity (knowledge) on practicals	24	30																							
Written essay	5	10																							
Tests (two)	10	20																							
Final exam	9	25																							
<b>Total:</b>	<b>60</b>	<b>100</b>																							
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																						
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																						
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																						
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																						
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																						
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																						
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>For being able to reach the final exam student has to gain up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, he/she has to go on complete final exam.</p> <p>Condition for reaching final exam: passed exam of courses Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritious, healing and poisonous plants, Physiology of animals, Nutrition of domestic animals, Animal husbandry, Animal hygiene, Microbiology, Immunology, Parasitology and parasitic diseases, Pharmacology, Pathophysiology, Pathology, Clinical and laboratory diagnostics in companion animals and equines, Clinical and laboratory diagnostics in farm animals, Diagnostic imaging methods, Clinical biochemistry, Internal diseases in companion animals and equines, Internal diseases in farm animals, Infectious diseases in domestic animals, Reproduction, General surgery with anesthesiology, Special surgery with orthopedics, Ophthalmology, Veterinary toxicology, Veterinary epidemiology, Avian diseases, Biology and pathology of fish, Hygiene and technology of meat, fish, eggs and honey, Hygiene and technology of milk.</p>																							
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																							
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral and written (includes one test)</p>																							
<b>22.</b>	<b>Textbooks</b>																								
	<b>22.1</b>	<b>Mandatory</b>																							

		Buncic, S. (2006) Integrated Food Safety and Veterinary Public Health Eley, A. R. (1996) Microbial Food Poisoning Garbutt, J. (1997) Essentials of Food Microbiology Doyle, M.P., Beuchat, L.R., Montville, T.J.(2007) Food Microbiology: Fundamentals and Frontiers Virginia N. Scott, Stevenson, K. E. (2006) HACCP A systematic approach to food safety
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Biology and pathology of game		
2.	Code	FVM522		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<b>Program course goals (competencies):</b> <i>The theory classes</i> of course Biology and pathology of game have aim to introduce students with the: term and meaning of hunting, Law on hunting in R. of Macedonia, organization of hunting in Macedonia, place and role of veterinary service in hunting, types and characteristics of the hunting grounds, ways for game breeding, biological characteristics and diseases of hunting game, damages caused by game, games damages and basics of the hunting cynology. In this manner, the future doctor for veterinary medicine will be able to gain: knowledge for recognizing the specifics in manifestation of clinical and pathomorphological changes in game diseases, capability for advising and applying appropriate medication of diseases in bred game, ability for advising and taking preventative measures including promotion of optimal game health and modern hunting. <i>The practicals</i> of this course have aim to introduce students with systematic and categorizing of hunting game, feed and methods for supplement feeding of game, eradication of harmful game and safe removal of game corpses, hunting weapon and first aid, hunting trophies, determination of game diseases, handling of shot game and protection of game.			
11.	<b>Brief content</b> <b>Theory classes</b> Definition and meaning of hunting. Hunting grounds. Game breeding. Characteristics of game diseases. Biological characteristics of game birds. Game birds diseases. Biological characteristics and diseases of wild leporids and rodents. Biological characteristics of wild ruminants. Wild ruminants diseases. Biological characteristics and wild boar diseases. Biological characteristics and wild carnivores diseases. Damages made to and caused by the game. Hunting cynology. <b>Practicals</b> Taxonomy and categorization of hunting game. Game nutrition. Eradication of harmful game and safe			

	removal of game corpses. Hunting weapon and first aid. Hunting trophy. Determining game's diseases. Handling shot game. Game protection. Visiting Skopje's Zoo. Visiting the Natural History Museum in Skopje. Visiting peasantry. Visiting breeding facility for wild ruminants. Visiting hunting ground and National park.			
<b>12.</b>	<b>Methods of studying</b> Theory classes: interactive (lectures in large group with discussion and active participation of the students). Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on theory classes	12	15
		Attendance on practicals	12	15
		Written essay	6	10
		First test	15	30
		Second test	15	30
		<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		With gaining up to 60 points from attendance on theory classes and practicals, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gain minimal 60 points.	
<b>20.</b>	<b>Teaching language</b>		<b>English</b>	

21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> definition and meaning of hunting, hunting grounds, game breeding, characteristics of game diseases, biological characteristics of game birds, game birds diseases, systematic and short review of hunting game's biology, game feeding, eradication of harmful game and safe removal of game corpses, hunting weapon and first aid, hunting trophy.</p> <p><b>Second test:</b> biological characteristics and diseases of wild leporids and rodents, biological characteristics of wild ruminants, wild ruminants diseases, biological characteristics and wild boar diseases, biological characteristics and carnivore's diseases, damages to and from the game, hunting cynology, determination of game's diseases, handling shot game, game protection.</p> <p><b>Complete final exam:</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<p><b>Textbooks</b></p>															
	<p><b>22.1</b></p>	<p><b>Mandatory</b></p> <p>1. Infectious Diseases of Wild Mammals and Birds in Europe, Dolores Gavier-Widen , Edited by Anna Meredith, Edited by J. Paul Duff</p> <p>2. Disease in Wild Animals : Investigation and Management, Gary A. Wobeser</p> <p>3. Essentials of Disease in Wild Animals, Gary A. Wobeser</p> <p>4. Wildlife Management and Conservation : Contemporary Principles and Practices, Paul R. Krausman , Edited by James W. Cain</p> <p>5. Pathology of Wildlife and Zoo Animals 1st Edition, Karen Terio, Denise McAloose, Judy St. Lege</p> <p>6. Foundations of Wildlife Diseases, Richard G. Botzler , Richard N. Brown.</p>														
	<p><b>22.2</b></p>	<p><b>Additional</b></p>														

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>
<b>1.</b>	<b>Program course title</b>	<b>Biology and pathology of bees</b>
<b>2.</b>	<b>Code</b>	<b>FVM523</b>
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>

4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ summer semester</b>	<b>ECTS credit points</b>	<b>2.5</b>
8.	<b>Teacher</b>	<b>Prof. Misho Hristovski, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<p><b>Program course goals (competencies):</b>  <i>The theory classes</i> of the course Biology and pathology of bees have the aim to introduce students with: beekeeping and its importance, development of apiculture and the api-technique, bee's products production, current state of apiculture in R. of Macedonia, term and meaning of apipathology, systematic of bees, species and breeds of bees that are breed in the world and our country, structure of the bee colony, life of the bee colony throughout the year, breeding of bee communities, undesirable appearances in the bee family, producing bee products, characteristics of organic bee production, diseases of bees and bee's nests, pests and enemies of bees, bee's poisoning, applying modern drugs in apiculture and measures for prevention, control and eradication of diseases, pests and poisoning of bees.</p> <p>In this manner, the future doctor for veterinary medicine will be able to: gain knowledge for basic terminology of apiculture and bee production, recognize the main clinical and pathomorphological changes in diseases of bees and bee's nests, advise and apply appropriate medication for diseases in bees and bee nest, take preventative measures including promotion of optimal health and apicultural production.</p> <p><i>The practicals</i> of the course Biology and pathology of bees have the aim to introduce students with development and function of individual members of the bee colony, anatomical and physiological characteristics of bees, the advantages and disadvantages of different types of nest sites, practical usage of tools and equipment for bees, formation of beehives, yearly schedule of management tasks in the beehive, the importance and performing the exam of bee colony, clinical and laboratory diagnostics of bee diseases and practical application of the means for prevention and control of diseases in bees and bee nest.</p>			
11.	<p><b>Brief content</b></p> <p><b>Theory classes</b>  Beekeeping and its meaning. Taxonomy of bees; bee species and breeds. Yearly life cycle of the bee colony. Breeding of bee's colonies. Breeding, replacement and adding queen bees. Undesirable appearances in the bee colony. Bee's pasture and bee's products. Organic beekeeping. Viral diseases of bees. Bacterial diseases of bees. Mycotic diseases of bees. Parasitic diseases of bees. Disease with non-infectious etiology; queen bee diseases and anomalies; bee's anomalies. Pests and enemies of bees and bee's poisoning.</p> <p><b>Practicals</b>  Members of bee colony, development (metamorphosis) of bees. Bee's anatomy and physiology. Bee nests and tools and equipment. Bee hives. Examination of bee colonies. Working in bee hive throughout the year. Diagnosis of bee's viral diseases. Diagnosis of bee's bacterial diseases. Diagnosis of bee's mycotic diseases. Diagnosis of bee's parasitic diseases. Drug application in bees. Field practice at bee hive.</p>			
12.	<p><b>Methods of studying</b></p> <p>Theory classes: interactive (lectures in large group with discussion and active participation of the students).</p> <p>Practicals: practicals and other ways of work with smaller groups</p>			

	Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
<b>13.</b>	<b>Total available time</b>	<b>87.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Theory classes: 1 hour/per week (15 hours) Practicals: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>42.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on theory classes</b>	<b>12</b>	<b>15</b>
		<b>Attendance on practicals</b>	<b>12</b>	<b>15</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>First test</b>	<b>15</b>	<b>30</b>	
	<b>Second test</b>	<b>15</b>	<b>30</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on theory classes and practicals, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gain minimal 60 points.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Beekeeping and its meaning, systematics of bees, bee species and breeds, yearly life cycle of bee colony, breeding of bee colonies, management, replacement and adding of bee queens, undesirable appearance in the bee colony, bee products, organic bee keeping, members of the bee colony, development (metamorphosis) of bees, bee's anatomy and physiology, bee nests, bee tools and equipment, beehives, management tasks in the beehives throughout the year and examination of the bee colonies.</p> <p><b>Second test:</b> Viral, bacterial, fungal and parasitic diseases of bees, diseases with non-infectious etiology, queen bee's diseases and anomalies, bee's anomalies, pests and enemies of the bees, bee's poisoning, diagnosis of bees and bee's colonies diseases and drug application in bees.</p> <p><b>Complete final exam:</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th>Grade mark</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	Grade mark	Points	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
Grade mark	Points															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	Textbooks															
22.1	<p><b>Mandatory</b></p> <p>1. Honey Bee Pathology 2nd Edition, Larissa Bailey B. Ball  2. Honey Bee Pests, Predators, and Diseases 3rd Edition, Roger a Morse , Kim Flottum  3. The Biology of the Honey Bee Revised Edition, Mark L. Winston  4. Honey Bees: Diseases, Parasites, Pests, Predators and their Management, N. Nagaraja, D Raja Gopal</p>															
22.2	<b>Additional</b>															

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Avian diseases
2.	Code	FVM524
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje

5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>	<b>Fifth year/ summer semester</b>	<b>ECTS credit points</b>	<b>6.5</b>
8.	<b>Teacher</b>		<b>Ass Prof. Aleksandar Dodovski, PhD</b>	
9.	<b>Preconditions</b>		Completed all courses from V to VIII semester. Realized extra mural practice in IV year.	
10.	<p><b>Program course goals (competencies):</b>  <i>Theory classes</i>  Basic aim of the course is to provide students with necessary quantum of knowledge about health and diseases in domestic poultry and other birds reared for economic purposes. Special emphasize is given to familiarization and overcoming of basic principles of farm poultry production, as well diagnostics, prevention and eradication of poultry diseases.  <i>Practicals</i>  Aim of the practical part is to provide students with knoweldge on adequate technology of poultry production and the basics of clinical and laboratory investigation in order to achieve accurate diagnosis.</p>			
11.	<p><b>Brief content</b>  <b>Theory classes</b>  Introduction to poultry health and production. Basic principles of prevention of diseases. Viral diseases. Bacterial diseases. Fungal diseases. Parasitic diseases. Noninfectious diseases (nutritional diseases, poisonings, vitamin deficiencies).  <b>Practicals</b>  Technology of production of parent stocks, technology in hatchery, technology of production of table egg layers, technology of production of broilers. Biosecurity measures on poultry farm. Vaccination in poultry production. Clinical and laboratory investigation of poultry. Chicken embryos as a tool in diagnostics. Laboratory methods for diagnosis of some of the OIE listed diseases.</p>			
12.	<p><b>Methods of studying</b>  Theory classes: interactive (lectures in large group with discussion and active participation of the students).  Practicals: practicals and other ways of work with smaller groups  Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay.</p>			
13.	<b>Total available time</b>		<b>162.5 hours</b>	
14.	<b>Organization of the course</b>		Theory classes: 3 hours/per week (45 hours) Practicals: 3 hours/per week (45 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>45 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>45 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>72,5 hours</b>
17.	<b>Method of assessment</b>			

Points gained by student's activities:			
	Type of activity	Points	
		minimum	maximum
	Attendance on theory classes	9	10,5
	Attendance and activity (knowledge) on practicals	9	10,5
	Written essay	7	9
	Tests (two)	2x10 = 20	2x20 = 40
	Final exam	15	30
	<b>Total:</b>	<b>60</b>	<b>100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	<p>For being able to pass the final exam student has to accumulate up to 45 points from theory classes and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on theory classes and practicals, before he/she reaches the exam needs to take the two tests.</p> <p><b>Written essay:</b> Evaluation takes into account ability of the student for finding and using peer reviewed literature, the structure of the essay, relevance of the data presented and appropriateness of the elaboration of the theme. If the essay does not fulfill these criteria, it would be sent back for further modification or it would not be graded.</p> <p>Condition for reaching final exam: passed exam of courses: Chemistry, Cell biology, Biochemistry, Anatomy of animals, Histology with embryology, Nutritional, healing and poisonous plants, Microbiology, Immunology, Physiology of animals, Animal husbandry, Animal hygiene, Nutrition of domestic animals, Patophysiology, Pathology, Pharmacology, Parasitology and parasitic diseases.</p>	
20.	Teaching language	English	

21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test (theoretical part):</b> Introduction to poultry health and production. Basic principles of prevention of diseases. Viral diseases.</p> <p><b>Second test (theoretical part):</b> Bacterial diseases. Fungal diseases. Parasitic diseases. Noninfectious diseases (nutritional diseases, poisonings, vitamin deficiencies).</p> <p><b>First test (practical part):</b> Technology of production of parent stocks, technology in hatchery, technology of production of table egg layers, technology of production of broilers. Biosecurity measures on poultry farm.</p> <p><b>Second test (practical part):</b> Vaccination in poultry production. Clinical and laboratory investigation of poultry. Chicken embryos as a tool in diagnostics. Laboratory methods for diagnosis of some of the OIE listed diseases.</p> <p><b>Final exam:</b> oral</p>
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>1. Diseases of Poultry, 13th Edition, D. Swayne (Ed.), Wiley-Blackwell, 2013</li> <li>2. Avian Disease Manual – 7<sup>th</sup> edition, M. Boulianne (Ed.), AAAP, 2012</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Analytical chemistry of food</b>		
2.	<b>Code</b>	<b>FVM525</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Zehra Hajrulai-Musliu, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses from V to VIII semester. Realized extra mural practice in IV year.		
10.	<b>Program course goals (competencies):</b>			

	Teaching on the course Analytical chemistry of food is exceptionally practical and here students are introduced to: the basic characteristics of food products, their quality and health safety; with the National Regulations, Directives, Legislation and Regulations concerning the food quality and food safety; as well as with the basic principles of analytical chemistry. Also, in this course students acquire knowledge about instrumental analytical methods that are most often applied for quality control and food safety, and acquire skills and knowledge for introducing new analytical methods, as well as validation and application of them in the control of the samples.		
<b>11.</b>	<b>Brief content</b> The role of analytical chemistry in quality control and food safety. Methods for determining the composition of food products - advantages and disadvantages of different methods for determination of moisture, ash and minerals, carbohydrates, dietary fibers, proteins and amino acids, fat, fatty acids and cholesterol, vitamins, additives, residues and contaminants. Labeling of food products. Statistical methods in food quality control. Introduction to the methods and techniques used in the control of the quality and health safety of the basic groups of food products: milk, meat, eggs, cereals, fruits and vegetables. Sampling, storage, preparation of samples for analysis (homogenization, weighing, types of extraction (liquid-liquid extraction, liquid-solid extraction, solid-phase extraction). Colorimetric, photometric and spectrophotometric methods. Quantitative analysis. Analysis based on the peak height. Analysis based on the the peak area. Gas chromatography (GC), principles of GC, basic parts of GC, types of columns. Highly efficient liquid chromatography (HPLC), HPLC separation methods, selection of the separation method, basic parts of the liquid chromatograph. Types of columns. Types of detectors. Mass spectrometry, working principle of MS, types of ions in MS, interpretation of mass spectra. Introduction to the legal regulations. Implementation and validation of new methods for qualitative and quantitative analysis of food products. Statistical data processing.		
<b>12.</b>	<b>Methods of studying</b> Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.		
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>	
<b>14.</b>	<b>Organization of the course</b>	Practicals: 2 hours/per week (30 hours)	
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>
			<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>
		<b>16.2</b>	<b>Individual tasks</b>
		<b>16.3</b>	<b>Self-directed learning</b>
			<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>		
	Points gained by student's activities:		
	<i>Type of activity</i>		<i>Points</i>
		<i>minimum</i>	<i>maximum</i>
	Attendance and activity (knowledge) on practicals	36	45
	Written essay	5	10
	Tests (four)	10	20
	Final exam	9	25
	<b>Total:</b>	<b>60</b>	<b>100</b>

18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	For being able to reach the final exam student has to gain up to 45 points from practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on practicals, he/she has to go on complete final exam. Condition for reaching final exam: passed exam of courses: Chemistry, Biochemistry	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (four):</b> written <b>Knowledge assessment:</b> Practical exam test <b>Final exam:</b> written <b>Complete final exam:</b> written + oral (includes one test)	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>G.D. Christian, P.K. Dasgupta, K.A. Schug (2013): Analytical chemistry (7<sup>th</sup> Edition). Wiley</li> <li>Y. Pomeranz, C. E. Meloan (2000): Food analysis: Theory and practise, Aspen Publication</li> <li>Nollet L.M. Handbook of food analysis Marcel Dekker, New York-Basel 2004</li> </ol>	
22.2	Additional		
		<ol style="list-style-type: none"> <li>Miller J.C., Miller J.N. Statistics for analytical chemistry Ellis Horwood PTR, Prentice Hall, New York 1994</li> <li>Handbook for instrumental techniques in analytical chemistry, Frank Settle, 2006</li> <li>Somenath Mitra, Sample Preparation Techniques in Analytical Chemistry, by John Wiley &amp; Sons, Inc. 2003</li> <li>Liquid Chromatography –Mass Spectrometry: An Introduction. Robert E. Ardrey Copyright 2003 John Wiley &amp; Sons, Ltd.</li> </ol>	

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Clinical practice: companion animals
2.	Code	FVM611
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

6.	Study year / semester	Sixth Year/ winter semester	ECTS credit points	9.4
8.	Teacher	<b>Prof. Plamen Trojachanec, PhD</b> <b>Prof. Jovana Stefanovska, PhD</b> <b>Ass. Prof. Ksenija Ilievska, PhD</b> <b>Ass. Prof. Irena Celeska, PhD</b> <b>Ass. Prof. Elena Atanaskova Petrov, PhD</b>		
9.	Preconditions	Completed all courses in IX and X semester. Realized extra mural practice in V year.		
10.	<b>Program course goals (competencies):</b> This course is realized by practical teaching on-the-field: with practical teaching in conditions of terrain practice (at the Faculty's Clinic). Students gain practical skills in reproduction, surgery, orthopedics, ophthalmology, internal medicine, infectious and parasitic diseases.			
11.	<b>Brief content</b> Teachers are supervising the students while working with live patients in small groups of 3 to 5. Students can be included in routine veterinary work at Faculty's Clinic.			
12.	<b>Methods of studying</b> Studying by clinical practical work.			
13.	Total available time	150 hours		
14.	Organization of the course	Practicals, 10 hours/per week (150 hours), in groups of 5-8 students		
15.	Forms of teaching activities	15.1	Lectures - theory classes	150 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	Method of assessment			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity (knowledge) on clinical practice	25	50
		Running work notebook with clinical protocols	25	50
	Total:	50	100	
18.	Grading criteria (points/grade)	Final grade mark is not predicted. Acquired credits are made by evaluation of protocols of clinical examination of the patient.		
19.	Requirement for signature and taking the final exam	Attendance on clinical practice according table of activities mentioned above.		
20.	Teaching language	English		

21.	<b>Method of monitoring the quality of teaching process</b>	Monitoring student's work notebook with clinical protocols.
22.	<b>Textbooks</b>	
	22.1	<b>Mandatory</b>
		Textbooks used from particular clinical disciplines included in the course.
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Clinical practice: farm animals</b>		
2.	<b>Code</b>	<b>FVM612</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Sixth year/ winter semester</b>	<b>ECTS credit points</b>	<b>9.4</b>
8.	<b>Teacher</b>	<b>Prof. Toni Dovenski, PhD</b> <b>Prof. Plamen Trojachanec, PhD</b> <b>Prof. Dine Mitrov, PhD</b> <b>Prof. Jovana Stefanovska, PhD</b> <b>Ass. Prof. Branko Atanasov, PhD</b> <b>Ass. Prof. Ksenija Ilievska, PhD</b> <b>Ass. Prof. Igor Djadjovski, PhD</b> <b>Ass. Prof. Kiril Krstevski, PhD</b> <b>Ass. Prof. Irena Celeska, PhD</b>		
9.	<b>Preconditions</b>	Completed all courses in IX and X semester. Realized extra mural practice in V year.		
10.	<b>Program course goals (competencies):</b>	This course is realized by practical teaching on-the-field: with practical teaching on livestock farms. Students gain practical skills in reproduction, surgery, orthopedics, ophthalmology, internal medicine, infectious and parasitic diseases.		
11.	<b>Brief content</b>	Teachers are supervising the students while working with live patients in small groups of 3 to 5. Students can be included in everyday veterinary work at the veterinary service of the livestock farms.		
12.	<b>Methods of studying</b>	Learning with practical work on a field.		
13.	<b>Total available time</b>	<b>150 hours</b>		

14.	<b>Organization of the course</b>		Practicals, 10 hours/per week (150 hours), in groups of 5-8 students		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>		
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>150 hours</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>		
		16.2	<b>Individual tasks</b>		
		16.3	<b>Self-directed learning</b>		
17.	<b>Method of assessment</b>				
		<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>	
		<b>Attendance and activity (knowledge) on clinical field practice</b>	<b>25</b>	<b>50</b>	
		<b>Running work notebook with clinical protocols</b>	<b>25</b>	<b>50</b>	
	<b>Total:</b>	<b>50</b>	<b>100</b>		
18.	<b>Grading criteria (points/grade)</b>		Final grade mark is not predicted. Acquired credits are made by evaluation of protocols of clinical examination of the patient.		
19.	<b>Requirement for signature and taking the final exam</b>		Attendance on clinical field practice according table of activities mentioned above.		
20.	<b>Teaching language</b>		<b>English</b>		
21.	<b>Method of monitoring the quality of teaching process</b>		Monitoring student's work notebook with clinical protocols.		
22.	<b>Textbooks</b>				
	22.1	<b>Mandatory</b>			
		Textbooks used from particular clinical disciplines included in the course.			
22.2	<b>Additional</b>				

Attachement No. 3		First, second and third cycle course program			
1.	Program course title	Practice in food industry enterprises			
2.	Code	FVM613			
3.	Study program	Veterinary medicine			
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje			
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies			
6.	Study year / semester	Sixth Year/ winter semester	ECTS credit points	9.4	
8.	Teacher	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD			
9.	Preconditions	Completed all courses in IX and X semester. Realized extra mural practice in V year.			
10.	<b>Program course goals (competencies):</b> Practice in food industry enterprises is course which is realized by practical teaching in slaughter houses and meat and dairy industry enterprises. Teachers are supervising the students while working in small groups of 3 to 5.				
11.	<b>Brief content</b> Practicals in slaughter houses and meat and dairy enterprises.				
12.	<b>Methods of studying</b> Learning with field practical work.				
13.	<b>Total available time</b>		<b>150 hours</b>		
14.	<b>Organization of the course</b>		Practicals, 10 hours/per week (150 hours), in groups of 5-8 students		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>		<b>150 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>		
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>		
		16.2	<b>Individual tasks</b>		
		16.3	<b>Self-directed learning</b>		
17.	<b>Method of assessment</b>				
		<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>	
		Attendance and activity (knowledge) on field practice	25	50	
		Running work notebook with inspection protocols	25	50	
	<b>Total:</b>	<b>50</b>	<b>100</b>		

18.	<b>Grading criteria (points/grade)</b>	Final grade mark is not predicted. Acquired credits are made by evaluation of inspection protocols.
19.	<b>Requirement for signature and taking the final exam</b>	Attendance on field practice according table of activities mentioned above.
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	Monitoring student's work notebook with inspection protocols.
22.	<b>Textbooks</b>	
	22.1	<b>Mandatory</b>
		Textbooks used from particular clinical disciplines included in the course.
	22.2	<b>Additional</b>

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
1.	<b>Program course title</b>	<b>Introduction in veterinary medicine</b>		
2.	<b>Code</b>	<b>FVM001</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>First year/ summer semester</b>	<b>ECTS credit points</b>	<b>1.5</b>
8.	<b>Teacher</b>	<b>Prof. Toni Dovenski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	The aim of the course is to introduce the students with definition and meaning of the veterinary medicine and veterinary profession worldwide in general, as well as in our country.		
11.	<b>Brief content</b>	Definition, subject and role of veterinary medicine and veterinary profession. Veterinary medicine as a profession. Historic development of veterinary and veterinary medicine. Development of veterinary education. History of veterinary medicine in Macedonia. Study of Faculty of Veterinary Medicine in Skopje. Veterinary enterprises and possibility of employment of doctors of veterinary medicine.		
12.	<b>Methods of studying</b>			

	Theory classes: lectures in large group Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>41.5 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>15 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>26.5 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on theory classes</b>	<b>5</b>	<b>15</b>
		<b>Written essay</b>	<b>20</b>	<b>85</b>
	<b>Final exam</b>	<b>Not predicted</b>		
	<b>Total:</b>	<b>25</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		<ol style="list-style-type: none"> <li>1. Materials prepared by the course teacher</li> <li>2. Internet</li> </ol>		
<b>22.2</b>	<b>Additional</b>			

--	--

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Environment protection		
2.	Code	FVM003		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/ winter semester	ECTS credit points	1.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The purpose of this course is students to gain closer knowledge of types and methods of environmental pollution through practicing routine veterinary work; Released contaminants by animal husbandry and animal industry and short introduction of ecological basic terminology.			
11.	<b>Brief content</b> Ecology – study subject and basic terms. Organizations and institutions in the field of environmental protection. Air pollution and protection. Water pollution and protection. Soil degradation and protection. Solid waste. Radioactive materials and environment. Chemistry and environment. Noise and environment. Environment monitoring. Animal production and environment.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	25 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	15 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	10 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	Method of assessment			

		Points gained by student's activities:		
		Type of activity	Points	
			minimum	maximum
		Attendance and activity on seminars	24	30
		Written essay	6	10
		Tests (two)	15(x2)=30	30(x2)=60
		Final exam	Not predicted	
		Total:	60	100
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	
		from 61 to 70 points	7 (seven) (D)	
		from 71 to 80 points	8 (eight) (C)	
		from 81 to 90 points	9 (nine) (B)	
		from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass one of the tests.		
20.	Teaching language	English		
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test: Ecology - basic terms, Pollution and protection of air, water and soil.</p> <p>Second test: Solid waste, Influence of radioactive materials, chemistry and noise on the environment, Environment monitoring and animal production and environment</p> <p><b>Final exam (optional):</b> oral or written (includes one test)</p>		
22.	Textbooks			
	22.1	Mandatory		
		<ol style="list-style-type: none"> <li>1. Extracts from referent textbooks</li> <li>2. Internet</li> </ol>		
22.2	Additional			

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Animal ecology
2.	Code	FVM004
3.	Study program	Veterinary medicine

4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/ winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Misho Hristovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> Introduction with ecology basic terminologies, emphasizing animal ecology. Studying interrelations of animals and biotic and abiotic factors of the ecosystems. Through this course students will be introduced with basic mechanisms of ecophysiology (biological rhythm, diapause, hibernation etc.), as well as definition of the terms population and biocenosis and their interactions, finalizing with ecological characteristics of different living environments and their anthropogenic pollution.			
11.	<b>Brief content</b> Ecology – definition and categorization. Environment. Biotic systems. Living conditions and meaning of ecological factors. Ecophysiology. Basic biotic systems and their functional characteristics. Biodiversity. Living environment for organisms. Anthropogenic impact on living environment. Radioactive contamination. Abiotic factors – examination and influence. Biotic factors – examination and influence. Action mechanism of ecophysiological events. Population, biocenosis and ecosystem. Evolutionary processes as factors in the biodiversity (natural selection, adaptation, mutation and species distinction as natural process). Physical-chemical properties and quality of water and soil as living environments. Physical-chemical properties and quality of air and light as living environments. Distribution of some biomes in the world. Detecting the pollution level and protection of the atmosphere. Detecting the pollution level and protection of the water and soil. Determining the level of radioactive contamination in the environment.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>20 hours</b>
17.	<b>Method of assessment</b>			

		Points gained by student's activities:		
		Type of activity	Points	
			minimum	maximum
		Attendance and activity on seminars	24	30
		Written essay	6	10
		Tests (two)	15(x2)=30	30(x2)=60
		Final exam	Not predicted	
		Total:	60	100
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	
		from 61 to 70 points	7 (seven) (D)	
		from 71 to 80 points	8 (eight) (C)	
		from 81 to 90 points	9 (nine) (B)	
		from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass one of the tests.		
20.	Teaching language	English		
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test: Ecology, living environment and biotic systems, living conditions and ecological factors and ecophysiology</p> <p>Second test: Functional characteristics of biotic systems, ecological characteristics of living environments and anthropogenic pollutions of the environment</p> <p><b>Final exam (optional):</b> oral or written (includes one test)</p>		
22.	Textbooks			
	22.1	Mandatory		
		<ol style="list-style-type: none"> <li>1. Extracts from referent textbooks</li> <li>2. Internet</li> </ol>		
22.2	Additional			

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Ecotoxicology
2.	Code	FVM005
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje

5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>		<b>Prof. Misho Hristovski, PhD</b>	
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> Introduction with basic principles, studying object, problems and approach to ecotoxicology resulting of emission of dangerous chemical matters in the living environment by human. Analyzing changes in the ecosystems resulting of released toxins in nature through practical examples and models. Final, ecological approach in risk assessment and management of toxicological pollutions prevention.			
11.	<b>Brief content</b> Ecotoxicology – problems and recommendations. Ecosystem’s response on chemical stress. Effects of chemical stress on aquatic species. Effects of chemicals on the structure of terrestrial ecosystems. Methods and models in ecotoxicology (methodological aspects, biostatistics models). Bioaccumulation of hydrophobic organic pollutants. Chemical stress on the living environment with carbon and phosphorus bio-geochemical cycles. Biomonitoring. Ecotoxicology legislation and management.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course’s topic by the student’s choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>		<b>50 hours</b>	
14.	<b>Organization of the course</b>		Seminars: 2 hours/per week (30 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>20 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	<b>Points gained by student’s activities:</b>			
			<i>Points</i>	
	<i>Type of activity</i>		<i>minimum</i>	<i>maximum</i>
	Attendance and activity on seminars		24	30
	Written essay		6	10
Tests (two)		15(x2)=30	30(x2)=60	
Final exam		Not predicted		
Total:		60	100	
18.	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>

		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test: Basic principles of ecotoxicology, chemical stress and ecosystem's reaction, Influence of chemical stress on aquatic and terrestrial ecosystems</p> <p>Second test: Methods and models in ecotoxicology, Bioaccumulation of hydrophobic organic pollutants, Chemical stress and bio-geochemical cycles, Biomonitoring and ecotoxicology legislation.</p> <p><b>Final exam (optional):</b> oral or written (includes one test)</p>	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>Levin A. S., Harwell A. M., Kelly R. J., Kimball D. K.: Ecotoxicology: Problems and Approaches. Springer – Verlag New York Inc, 1989</li> <li>Extracts from referent textbooks, Internet</li> </ol>	
	<b>22.2</b>	<b>Additional</b>	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Chemistry of natural compounds</b>		
<b>2.</b>	<b>Code</b>	<b>FVM006</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Second year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Zehra Hajrulai-Musliu, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	Food chemistry is one of the largest parts of the food science. Course Chemistry of natural compounds has aim to familiarize students with the role and significance the composition and properties of natural compounds which are normal food content, or just present in food.		
<b>11.</b>	<b>Brief content</b>			

	<p><b>Seminars</b> A brief review of natural organic compounds. Origin and diversity of natural organic compounds. General methods for their isolation: crystallization, chromatographic methods, methods of extraction, distillation with water vapour, etc.. Glycosides. Creating and hydrolysis of glycosides. Activation and coupling-synthesis of peptides on solid phase. Some specific linear and cyclic peptides and proteins. Terpenoids. Common routes of biogenesis. Determining the structure of terpenoids. Monoterpenoids. Diterpenoids. Triterpenoids. Tetraterpenoids. Poliioprenoids. Saponins. Phytosterols. Stereochemistry, biosynthesis, chemical synthesis and transformations. Lipids. Structure of fatty acids. Biosynthesis. Chemical synthesis. Prostaglandins. Structure, biosynthesis and synthesis. Thromboxane and leukotrienes. Polyphenols. Structural types. Presence in nature. Isolation and determination of the structure. Biosynthesis. Laboratory synthesis. Alkaloids. Structural features. Presence in nature. Isolation and determination of the structure. Biosynthesis. Alkaloids of ornithine and lysine. Alkaloids from phenilalanin and tyrosine. Alkaloids from tryptophan. Synthesis of alkaloids. Plant pigments.</p> <p><b>Practicals</b> Chromatographic techniques. Continuous extraction of natural material. Isolation of lactose from milk. Isolation of glycosides from natural materials. Peroxidation in animal fat. Extraction of essential oils. Isolation of phenolic compounds from grapes. Extraction of alkaloids: piperin from pepper. Nicotine from tobacco, caffeine from coffee. Plant pigments: isolation of <math>\beta</math>-carotene from carrots.</p>			
12.	<p><b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Practicals: practicals and other ways of work with smaller groups Written essay: learning with use of referent textbooks and internet, preparing written essay.</p>			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	Self-directed learning	20 hours
17.	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	12	15
		Attendance and activity (knowledge) on practicals	12	15
		Written essay	6	10
	Tests (two)	15(x2)=30	30(x2)=60	
	Final exam	Not predicted		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
18.	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Besides attendance on theory classes and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained per test. Final exam is not predicted. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: general part Second test: special part <b>Final exam:</b> not predicted <b>Complete final exam:</b> not predicted	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>1. J. Mann, R.S. Davidson, J.B. Hobbs, D.V. Banthorp, J.B. Harborne: Natural products - their chemistry and biological significance, Longman, London, 1994;</li> <li>2. M. Miloš, P.M. Dewick, Medicinal natural products - a biosynthetic approach, John Wiley &amp; Sons, New York, 1997;</li> </ol>	
	<b>22.2</b>	<b>Additional</b>	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Anatomy of exotic and laboratory animals</b>		
<b>2.</b>	<b>Code</b>	<b>FVM007</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Second year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Vlatko Ilieski, PhD Prof. Lazo Pendovski, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			

<b>10.</b>	<b>Program course goals (competencies):</b> Studying the structure and functional anatomy of the exotic and laboratory animals. The program takes all of the aspects of the anatomy of the animals, which are prerequisites for their rearing and nutrition. This program corresponds with the needs of future veterinarians for their education and knowledge which they will implement in the animal welfare law and regulations.			
<b>11.</b>	<b>Brief content</b> Anatomy of the exotic animals. Using radiograms in the exotic animal diseases diagnosis. Anatomy of fish. Anatomy of green iguana. Anatomy of mouse. Anatomy of snake. Anatomy of tortoise. Anatomy of ferret. Anatomy of chicken. Anatomy of ostrich. Anatomy of pigeon. Anatomy of song bird.			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay. Use of plastinated models and educative video materials.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	<b>20 hours</b>
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity on seminars	24	30
		Written essay	6	10
		Tests (two)	15(x2)=30	30(x2)=60
	Final exam	Not predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: basic anatomy of exotic and laboratory animals Second test: cases from clinical practice <b>Final exam:</b> oral or written (includes one test)
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>1. Materials prepared by the course teachers</li> <li>2. Extracts from referent textbooks</li> <li>3. Internet</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Protection and management with endangered animal species</b>		
2.	<b>Code</b>	<b>FVM008</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Third year/ winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Misho Hristovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	Introduction of students with methods and means of protection in endangered animal species and meaning of biodiversity. This course allows information for endangered animal species in Republic of Macedonia and including students for preparation of projects which ensure constant protection of particular endangered species. Before including in this type of projects, students will have opportunity to introduce with biological features for certain species of animal with designing appropriate measures to protect. Prepared projects will form the basis for further implementation of the same within the Faculty, involvement of students who have made the appropriate project.		
11.	<b>Brief content</b>			
	<b>Seminars</b>	World strategy for protection of biodiversity. General principles for protection of endangered animal species (genetic banks, reserve, breeding in captivity, reintroduction etc.). Endangered animal species in Republic of Macedonia – biological features and current status count.		
	<b>Practicals</b>			

	Work in groups (6-8 students) and preparation of project for protection of endangered animal species in Republic of Macedonia: Define project and choice theme. Scientific-researching work: biological features of target animal species; practical methods and measures for protection of target animal. Visiting and choice of an appropriate location for realization of provided project. Preparing of action and time plan for implementation of the project. Financial construction of the project. Making of the final project. Making final presentation of the project and next steps.				
<b>12.</b>	<b>Methods of studying</b> Seminars: lectures in group with discussion and active participation of the students Preparation of a project in groups of 6-7 students.				
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>			
<b>14.</b>	<b>Organization of the course</b>	Seminars: 6 hours Practicals (project preparation): 24 hours Total: 2 hours /per week (30 hours)			
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>6 hours</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>24 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	Points gained by student's activities:				
		<i>Type of activity</i>		<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
		Attendance on seminars and predicted activities		12	15
	Project preparation		48	85	
	Final exam		Not predicted		
	Total:		60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		Final exam is not predicted and scoring is based on activity shown by the student during the preparation of the project.		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. Knowledge quality assessment is done by points acquired according table of activities mentioned above.		
<b>22.</b>	<b>Textbooks</b>				
	<b>22.1</b>	<b>Mandatory</b>			

		<ol style="list-style-type: none"> <li>1. Documents and literature from appropriate institutions in RM</li> <li>2. Extracts from referent textbooks, Internet</li> </ol>
	<b>22.2</b>	<b>Additional</b>

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Production of bulky feed</b>		
<b>2.</b>	<b>Code</b>	<b>FVM009</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Second year/ summer or winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Risto Prodanov, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	<p>Aim of the course Production of bulky feed is to familiarize students and future veterinary specialists (with main occupation intensive animal breeding) with general characteristics of plants used in animal nutrition, their nutritional value, their digestive and biological value, as well as the way of preparing voluminous (bulky) feed, for expedient and rational settlement needs in domestic animals.</p> <p>A contribution it that direction would be introduction of newest varieties and hybrids of forage plants, their growth needs, the basics of production technology – new technological solutions, such as crop rotation, type and soil manipulation, utilization of various fertilizers, seeds, sowing, cultivation, protection etc.</p> <p>The ultimate goal of the course Production of bulky feed is, with proper nutrition of animals, to influence on quantitative and qualitative gain of safe animal feed, i.e. food for man (meat, milk, eggs).</p>		
<b>11.</b>	<b>Brief content</b>	<p>Introduction to feed base. Chemical composition of plants (essentiality of certain substances that are important in the diet of domestic animals). Influence of the composition of the soil to produce forage plants. The impact of agrotechnical measures for the production of forage plants. Cultivating and goals in cultivating feed crop in crop rotation. The role and importance of green forage “conveer”. Forage plants of arable land. Cereals – as forage plants. Annual pods. Perennial pods. Rootstock and tuberous plants. Other forage plants. Forage plants of meadows and pastures. Preparation, preservation and storage of feed. Preparation of hay. Preparation of haylage. Preparation of silage. Preservation of feed by dehydration (flour, briquettes, pellets). Feed quality assessment.</p>		
<b>12.</b>	<b>Methods of studying</b>			

	Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.																						
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>																					
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)																					
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>																				
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																				
			<b>30 hours</b>																				
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																				
		<b>16.2</b>	<b>Individual tasks</b>																				
		<b>16.3</b>	<b>Self-directed learning</b>																				
			<b>20 hours</b>																				
<b>17.</b>	<b>Method of assessment</b>																						
	Points gained by student's activities:																						
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance and activity on seminars</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>6</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>15(x2)=30</td> <td>30(x2)=60</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Not predicted</td> </tr> <tr> <td>Total:</td> <td>60</td> <td>100</td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance and activity on seminars	24	30	Written essay	6	10	Tests (two)	15(x2)=30	30(x2)=60	Final exam	Not predicted		Total:	60	100
<i>Type of activity</i>	<i>Points</i>																						
	<i>minimum</i>	<i>maximum</i>																					
Attendance and activity on seminars	24	30																					
Written essay	6	10																					
Tests (two)	15(x2)=30	30(x2)=60																					
Final exam	Not predicted																						
Total:	60	100																					
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																				
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																				
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																				
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																				
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																				
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																				
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.																					
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																					
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>First test:</b> types, quality and application of forage feed <b>Second test:</b> preservation and application of feed <b>Final exam:</b> oral or written (includes one test)																					
<b>22.</b>	<b>Textbooks</b>																						
	<b>22.1</b>	<b>Mandatory</b>																					

		<ol style="list-style-type: none"> <li>1. Animal Feeding and Nutrition 11th Edition, Jurgens Marshall H, Bregendahl Kristjan, Coverdale Jozie, Hansen Stephanie L</li> <li>2. Applied Animal Nutrition: Feeds and Feeding (3rd Edition) 3rd Edition, Peter R. Cheeke</li> <li>3. Livestock Feeds and Feeding (6th Edition) 6th Edition, Richard O. Kellems, David C. Church</li> <li>4. Animal Nutrition Science, G Dryden</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Zoology of wildlife		
2.	Code	FVM010		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the basics of biological characteristics of wildlife in Republic of Macedonia. It includes the role of wildlife in the ecosystem, taxonomy, biological characteristics and conservation methods of wildlife. During the seminars the types of wildlife in Republic of Macedonia will be examined in groups.			
11.	<b>Brief content</b> The role of wildlife in the ecosystem. Taxonomy and division of wildlife. Biological characteristics of wildlife in Republic of Macedonia: wild fowl, wild leporides and rodents, wild hoofed animals, wild carnivores. Endangered species. Wildlife protection measures.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours

16.	Other forms of activities	16.1	Project tasks			
		16.2	Individual tasks			
		16.3	Self-directed learning	20 hours		
17.	Method of assessment					
	Points gained by student's activities:					
			<i>Type of activity</i>	<i>Points</i>		
				<i>minimum</i>	<i>maximum</i>	
			Attendance on seminars	24	30	
			Written essay	6	10	
			First test	15	30	
		Second test	15	30		
		Total:	60	100		
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)		
			from 51 to 60 points	6 (six) (E)		
			from 61 to 70 points	7 (seven) (D)		
			from 71 to 80 points	8 (eight) (C)		
			from 81 to 90 points	9 (nine) (B)		
			from 91 to 100 points	10 (ten) (A)		
19.	Requirement for signature and taking the final exam		<p>With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam.</p> <p>Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>			
20.	Teaching language		English			
21.	Method of monitoring the quality of teaching process		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.			
			<b>Tests (two):</b> written			
			<b>First test:</b> The role of wildlife in the ecosystem, Taxonomy and division of wildlife, Biological characteristics of wild leporides and rodents.			
			<b>Second test:</b> Biological characteristics of wild hoofed animals, wild carnivores, Endangered species, Measures of protection of wildlife.			
			<b>Complete final exam:</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:			
					<i>Grade mark</i>	<i>Points</i>
					5	до 59
		6	60-68			
		7	69-76			
		8	77-84			
		9	85-92			
		10	93-100			
22.	Textbooks					

		<b>Mandatory</b>	
	<b>22.1</b>	1. Hawksworth L.D. and Bull T.A.: <b>Biodiversity and Conservation in Europe</b> . Springer, 2008. 2. Hawksworth L.D. and Bull T.A.: <b>Vertebrate Conservation and Biodiversity</b> . Springer, 2007. 3. <b>Grzimek's Animal Life Encyclopedia – Birds</b> . Thomson-Gale, 2003. 4. <b>Grzimek's Animal Life Encyclopedia – Mammals</b> . Thomson-Gale, 2004.	
	<b>22.2</b>	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Welfare of fish		
2.	Code	FVM011		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/ winter semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of course is to obtain theoretic basis to the students about welfare of fish in extensive production. It includes main aspects about welfare of animals and fish, stress reaction impact, impact of environment abiotical and biotical factors, aquacultural production and disease on welfare of fish. During the seminars, various problems from the modern aquacultural production from aspect of welfare of fish would be elaborated. The aim of course is to obtain theoretic basis to the students about welfare of fish in extensive production.			
11.	<b>Brief content</b> Welfare and fish. Stress reaction in fish. Pain and fear in fish. Suffering in fish. Fish welfare legislative. Breeding practice and welfare of fish. Flock density and welfare of fish. Fins injuries in breded fish. Water quality and welfare of fish. Transport and welfare of fish. Implications of diseases and drugs on welfare on fish. Deformities in fish and welfare. Fishing and welfare of fish. Welfare of ornamental fish species.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing wtitten assay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.		15.1	Lectures - theory classes	

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on seminars</b>	<b>24</b>	<b>30</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>First test</b>	<b>15</b>	<b>30</b>	
	<b>Second test</b>	<b>15</b>	<b>30</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam.</p> <p>Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.  <b>Tests (two):</b> written  <b>First test:</b> Welfare and fish, Stress reaction in fish, Pain and fear in fish, Suffering in fish, Fish welfare legislative, Breeding practice and welfare of fish, Flock density and welfare of fish.  <b>Second tests:</b> Fins injuries in breded fish, Water quality and welfare of fish, Transport and welfare of fish, Implications of diseases and drugs on welfare on fish, Deformities in fish and welfare, Fishing and welfare of fish, Welfare of ornamental fish species  <b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<p><b>Textbooks</b></p>															
	<p><b>Mandatory</b></p>															
	<p>22.1</p>	<p>Branson J.E.: <b>Fish Welfare</b>. Blackwell Publishing Ltd, 2008.</p>														
	<p>22.2</p>	<p><b>Additional</b></p>														

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Beekeeping		
2.	Code	FVM012		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		

<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the basic knowledge of modern production of bee products. The seminars include the meaning of beekeeping and the basic systematic and biological characteristics of the honey bee, beekeeping, bee hives and the necessary beekeeping tools and equipment, the technological procedures which should be used to have organic certified bee products and bee health protection. Also, during the seminars the students will have practical insight in the procedures of modern production of bee products.			
<b>11.</b>	<b>Brief content</b> Significance of beekeeping. Taxonomy and types and of bees. Members of the bee family. Biological characteristics of the honey bee. Starting the beekeeping. Bee hives, tools and equipment for beekeeping. Beekeeping technology. Honey giving plants. Bee products. Health protection of bees.			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
		First test	15	30
	Second test	15	30	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.														
20.	<b>Teaching language</b>	<b>English</b>														
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Significance of beekeeping, Taxonomy and types and of bees, Members of the bee family, Biological characteristics of the honey bee, Starting the beekeeping.</p> <p><b>Second test:</b> Bee hives, tools and equipment for beekeeping, Beekeeping technology, Honey giving plants, Bee products, Health protection of bees</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Grade mark</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	Grade mark	Points	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
Grade mark	Points															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<b>Textbooks</b>															
	<b>Mandatory</b>															
	22.1	1. Bees : Biology, Threats & Colonies, Richard M. Florio 2. Bees: Biology & Management, Peter G. Kevan 3. Honey Bee Pathology 2nd Edition, Larissa Bailey B. Ball 4. Honey Bee Pests, Predators, and Diseases 3rd Edition, Roger a Morse , Kim Flottum														
22.2	<b>Additional</b>															

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Economics and organization of livestock production
2.	Code	FVM013
3.	Study program	Veterinary medicine

4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Blagica Sekovska, PhD Ass. Prof. Nikola Adamov, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> <b>Seminars</b> In the second year of curriculum of veterinary medicine the courses Animal husbandry and Rural economy are included as compulsive courses, so Economy and organization of livestock production is upgrade of both courses and logical extension of knowledge, especially for student who would work with farm production. Aim of this course is introduction with characteristics of an farm company, characteristics of farm breeding of different animal species: cattle, sheep and goats, pig and poultry. All particular characteristics of these productions would be elaborated both from organizational-technical and economic aspect. Also this course would obtain to the student getting sense about his/her responsibility as a part of a national economy, as well as the place and role of the veterinary profession in the total economy. <i>The practicals</i> have to obtain support to the theory classes and to provide additional elaboration of some topics from the practical aspect, via different teaching methods, as dramatization of some hypothetic situations and problem solving, making different economic analyses about the economic benefits of the company as the risk analysis, cost-benefit analysis, discussions on some topics interesting for the students etc. Practical include also the visit of a company in rural region where some of the principles elaborated in the theory classes would be demonstrated practically.			
11.	<b>Brief content</b> Management of livestock farm in 21 century. Condition balance of livestock farm and analysis. Success balance of livestock farm and analysis. Economic principles – choice of production levels in livestock farm. Costs concept in economy of livestock farm. Planning in livestock farm. Organization in livestock farm. Buisness in livestock farm. Analysis in livestock farm. Human resources management in livestock farm.			
12.	<b>Methods of studying</b> Seminars: lectures in large group with discussion and active participation of the students Practicals: practicals with a visit of a farm. Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	

		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on seminars</b>	<b>8</b>	<b>12</b>
		<b>Attendance and activity (knowledge) on practicals</b>	<b>12</b>	<b>14</b>
		<b>Written essay</b>	<b>10</b>	<b>14</b>
		<b>Tests (two)</b>	<b>15(x2)=30</b>	<b>30(x2)=60</b>
	<b>Final exam</b>	/		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		One test is graded by the one teacher, and the other one by the other teacher. Final grade mark is main of the two evaluations, but on student request exam can be also oral.	
<b>20.</b>	<b>Teaching language</b>		<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Periodical evaluation (two):</b> written First test: Economic aspects Second test: Organizational aspects <b>Final exam:</b> on student's request <b>Complete final exam:</b> not predicted	
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		<ol style="list-style-type: none"> <li>1. Bardhan D.: Textbook On Livestock Economics Marketing and Business, 2012</li> <li>2. K.S. Gangadhar: Livestock Economics: Marketing,Business Management and Accountancy, 2009</li> <li>3. David L. Debertin: Agricultural Production Economics, 2012</li> </ol>		
	<b>22.2</b>	<b>Additional</b>		
	<ol style="list-style-type: none"> <li>1. current internet web sites recommended by course teachers</li> </ol>			

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Diversity and protection of wild carnivores		
2.	Code	FVM014		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the basic knowledge for protecting wild carnivores. During the seminars various programs for wild carnivores protection will be studied.			
11.	<b>Brief content</b> Significance of wild carnivores within the ecosystem. Taxonomy of wild carnivores. Biological characteristics of wild carnivores. Endangered species of wild carnivores. Measures for protection of wild carnivores of the families: <i>Felidae</i> , <i>Canidae</i> , <i>Ursidae</i> , <i>Mustelidae</i> .			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
			<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	Attendance on seminars		24	30
	Written essay		6	10
	First test		15	30
Second test		15	30	
Total:		60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)
			from 51 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)

		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>														
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>														
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>														
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam.</p> <p>Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>															
<b>20.</b>	<b>Teaching language</b>	<b>English</b>															
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Significance of wild carnivores within the ecosystem, Taxonomy of wild carnivores, characteristics of wild carnivores, Endangered species of wild carnivores</p> <p><b>Second test:</b> Measures for protection of wild carnivores</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td><b>5</b></td> <td><b>до 59</b></td> </tr> <tr> <td><b>6</b></td> <td><b>60-68</b></td> </tr> <tr> <td><b>7</b></td> <td><b>69-76</b></td> </tr> <tr> <td><b>8</b></td> <td><b>77-84</b></td> </tr> <tr> <td><b>9</b></td> <td><b>85-92</b></td> </tr> <tr> <td><b>10</b></td> <td><b>93-100</b></td> </tr> </tbody> </table>		<i>Grade mark</i>	<i>Points</i>	<b>5</b>	<b>до 59</b>	<b>6</b>	<b>60-68</b>	<b>7</b>	<b>69-76</b>	<b>8</b>	<b>77-84</b>	<b>9</b>	<b>85-92</b>	<b>10</b>	<b>93-100</b>
<i>Grade mark</i>	<i>Points</i>																
<b>5</b>	<b>до 59</b>																
<b>6</b>	<b>60-68</b>																
<b>7</b>	<b>69-76</b>																
<b>8</b>	<b>77-84</b>																
<b>9</b>	<b>85-92</b>																
<b>10</b>	<b>93-100</b>																
<b>22.</b>	<b>Textbooks</b>																
	<b>Mandatory</b>																
<b>22.1</b>	<p>1. Hawksworth L.D. and Bull T.A.: <b>Biodiversity and Conservation in Europe</b>. Springer, 2008.</p> <p>2. Hawksworth L.D. and Bull T.A.: <b>Vertebrate Conservation and Biodiversity</b>. Springer, 2007.</p> <p>3. Macdonald W.D. and Sillero-Zubiri C.: <b>Biology and Conservation of Wild Canids</b>. Oxford University Press, 2004.</p> <p>4. <b>Grzimek's Animal Life Encyclopedia – Mammals</b>. Thomson-Gale, 2004.</p>																
	<b>Additional</b>																
<b>22.2</b>																	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>
<b>1.</b>	<b>Program course title</b>	<b>Diversity and protection of birds of prey</b>
<b>2.</b>	<b>Code</b>	<b>FVM015</b>
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>

4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/ winter semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the basic knowledge for protecting birds of pray. During the seminars various programs for protecting birds of pray will be studied.			
11.	<b>Brief content</b> Significance of birds of pray within the ecosystem. Taxonomy of birds of pray. Biological characteristics of birds of pray. Measures of protection of: hawks, eagles, falcons, vultures, blizzards, owls.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
		First test	15	30
	Second test	15	30	
	Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)
		from 51 to 60 points		6 (six) (E)
		from 61 to 70 points		7 (seven) (D)
		from 71 to 80 points		8 (eight) (C)
		from 81 to 90 points		9 (nine) (B)
		from 91 to 100 points		10 (ten) (A)

19.	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.														
20.	<b>Teaching language</b>	<b>English</b>														
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Significance of birds of pray within the ecosystem, Taxonomy of birds of pray, characteristics of birds of pray, Endangered species of birds of pray.</p> <p><b>Second test:</b> Measures for protection of birds of pray.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<b>Textbooks</b>															
	<b>22.1</b>	<p><b>Mandatory</b></p> <p>1. Hawksworth L.D. and Bull T.A.: <b>Biodiversity and Conservation in Europe</b>. Springer, 2008. 2. Hawksworth L.D. and Bull T.A.: <b>Vertebrate Conservation and Biodiversity</b>. Springer, 2007. 3. <b>Grzimek's Animal Life Encyclopedia – Birds</b>. Thomson-Gale, 2003.</p>														
	<b>22.2</b>	<p><b>Additional</b></p>														

Attachment No. 3		First, second and third cycle course program
1.	<b>Program course title</b>	<b>Diversity and protection of fish</b>
2.	<b>Code</b>	<b>FVM016</b>
3.	<b>Study program</b>	<b>Veterinary medicine</b>
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>

5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>		<b>Third year/ winter semester</b>	<b>ECTS credit points</b>   <b>2.0</b>
8.	<b>Teacher</b>		<b>Prof. Misho Hristovski, PhD</b>	
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the basic knowledge about the diversity of fish and ways of protecting them. During the seminars the manners of protecting the endangered species of fish will be studied in groups.			
11.	<b>Brief content</b> Significance of fishing and aquaculture. Taxonomy of fish. Endangered fish species. Modification of natural habitats. Dams and other hydrological objects. Water quality. Introduced species. Overfishing. Trade. Aquaculture.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>		<b>50 hours</b>	
14.	<b>Organization of the course</b>		Seminars: 2 hours/per week (30 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>20 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
		First test	15	30
	Second test	15	30	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
18.	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.														
20.	<b>Teaching language</b>	<b>English</b>														
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Significance of fishing and aquaculture, Taxonomy of fish, Endangered species of fish, Modification of natural habitats, Dams and other hydrological objects.</p> <p><b>Second test:</b> Water quality, Introduced species, Overfishing, Trade, Aquaculture.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<b>Textbooks</b>															
	<b>Mandatory</b>															
22.1	<ol style="list-style-type: none"> <li>Helfman S.G.: <b>Fish Conservation</b>. Island Press, Washington, USA, 2007.</li> <li>Nelson S.J.: <b>Fishes of the World</b>. John Wiley &amp; Sons, Inc., 2006.</li> <li>Hickman P.C., Roberts S.L. Larson A.: <b>Animal Diversity</b>. The McGraw-Hill Companies, 2002.</li> <li>Levin A.S.: <b>Encyclopedia of Biodiversity</b> Vol. 2. Academic Press, 2001.</li> </ol>															
22.2	<b>Additional</b>															

Attachement No. 3		First, second and third cycle course program
1.	<b>Program course title</b>	<b>Ornamental aquaculture</b>
2.	<b>Code</b>	<b>FVM017</b>
3.	<b>Study program</b>	<b>Veterinary medicine</b>
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>

5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>		<b>Third year/ winter semester</b>	<b>ECTS credit points</b>   <b>2.0</b>
8.	<b>Teacher</b>		<b>Prof. Misho Hristovski, PhD</b>	
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with the ways of rearing ornamental fish. During the seminars the ways of farming ornamental fish will be studied in groups.			
11.	<b>Brief content</b> Historical development of ornamental aquaculture. Types of ornamental freshwater fish. Water quality. Water quantity. Management of water. Reproduction of ornamental fish. Growth and development of ornamental fish. Farming. Health management of the farmed fish. Marketing.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>		<b>50 hours</b>	
14.	<b>Organization of the course</b>		Seminars: 2 hours/per week (30 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>20 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on seminars</b>	<b>24</b>	<b>30</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>First test</b>	<b>15</b>	<b>30</b>	
	<b>Second test</b>	<b>15</b>	<b>30</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
18.	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.														
20.	<b>Teaching language</b>	<b>English</b>														
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Historical development of ornamental aquaculture, Types of ornamental freshwater fish, Water quality, Water quantity, Management of water.</p> <p><b>Second test:</b> Reproduction of ornamental fish, Growth and development of ornamental fish, Farming, Health management of the farmed fish. Marketing</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<b>Textbooks</b>															
	22.1	<p><b>Mandatory</b></p> <p>Stickney R.R.: <b>Encyclopedia of aquaculture</b>. John Wiley &amp; Sons, Inc. New York, USA, 2000.</p>														
	22.2	<p><b>Additional</b></p>														

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Sport and hobby fishing
2.	Code	FVM018
3.	Study program	Veterinary medicine

4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Miso Hristovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to give students basic for the rules and techniques of the sport fishing. It covers significance of sport fishing, significant fish species, required equipment and accessories, methods of fishing, restocking and protect of fish fund. During seminars, in groups will be processed technics of fishing for different kinds of fish.			
11.	<b>Brief content</b> Sport fishing worldwide and in our country. Fish species significant for sports and recreational fishing. Fishing tools and equipment. Food and baits for fishing. Fishing techniques. Fishing bon-ton. Organization of matches. Restocking on open waters. Protection of fish fund. Law on fisheries and aquaculture. National federation of Macedonia in sports fishing.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
	First test	15	30	
	Second test	15	30	
	Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)
		from 51 to 60 points		6 (six) (E)
		from 61 to 70 points		7 (seven) (D)
		from 71 to 80 points		8 (eight) (C)

		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>														
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>														
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam.</p> <p>Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>															
<b>20.</b>	<b>Teaching language</b>	<b>English</b>															
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Sport fishing worldwide and our country, fish species significant for sports and recreational fishing, fishing tools and equipment, food and baits for fishing, fishing techniques, fishing bon-ton</p> <p><b>Second test:</b> Organization of matches, restocking on open waters, protection of fish fund, law on fisheries and aquaculture, National federation of Macedonia in sports fishing</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td><b>5</b></td> <td><b>до 59</b></td> </tr> <tr> <td><b>6</b></td> <td><b>60-68</b></td> </tr> <tr> <td><b>7</b></td> <td><b>69-76</b></td> </tr> <tr> <td><b>8</b></td> <td><b>77-84</b></td> </tr> <tr> <td><b>9</b></td> <td><b>85-92</b></td> </tr> <tr> <td><b>10</b></td> <td><b>93-100</b></td> </tr> </tbody> </table>		<i>Grade mark</i>	<i>Points</i>	<b>5</b>	<b>до 59</b>	<b>6</b>	<b>60-68</b>	<b>7</b>	<b>69-76</b>	<b>8</b>	<b>77-84</b>	<b>9</b>	<b>85-92</b>	<b>10</b>	<b>93-100</b>
<i>Grade mark</i>	<i>Points</i>																
<b>5</b>	<b>до 59</b>																
<b>6</b>	<b>60-68</b>																
<b>7</b>	<b>69-76</b>																
<b>8</b>	<b>77-84</b>																
<b>9</b>	<b>85-92</b>																
<b>10</b>	<b>93-100</b>																
<b>22.</b>	<b>Textbooks</b>																
	<b>Mandatory</b>																
<b>22.1</b>	<ol style="list-style-type: none"> <li>Toth, M.: <b>Fishing Basics</b>. Penguin publisher, 1997.</li> <li>Young C.D.: <b>Fly Fishing – The lifetime sport</b>. Honeybear Press LLC, USA, 2005</li> </ol>																
<b>22.2</b>	<b>Additional</b>																

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Basis of cytology diagnostics		
2.	Code	FVM019		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/ winter semester or Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is better and easier learning of basic principles of clinical cytology, which can be used in routine diagnostic. As a scientific discipline it can be abroad useful in clinical diagnostics.			
11.	<b>Brief content</b> Principles in cytology evaluation. Cytopathological techniques. Infective agents. Integument and subcutaneously lesions. Lymphatic system – lymph nodes, lien and thymus. Cerebrospinal fluid. Head and neck – oropharynx, tonsils, salivary glands, thyroid gland, parathyroid glands. Respiratory system – nasal cavity, trachea, bronchi and lung. Pleural and peritoneal fluid. Gastrointestinal system – intestine, liver, pancreas. Muscle-skeletal system. Synovial fluid. Urinary system – kidney, urethra and urinary bladder. Reproductive system – vagina, uterus, prostate, testis and mammary gland. Eye and ear			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	20 hours
17.	Method of assessment			

		Points gained by student's activities:		
		Type of activity	Points	
			minimum	maximum
		Attendance on seminars	4	15
		Activity (knowledge) on seminars	0	2.5
		Written assay	0	2.5
		Final exam	0	80
		<b>Total:</b>	<b>4</b>	<b>100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	
		from 61 to 70 points	7 (seven) (D)	
		from 71 to 80 points	8 (eight) (C)	
		from 81 to 90 points	9 (nine) (B)	
		from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Minimum points from the seminars is requirement for getting course teacher's signature at the end of the semester. The final exam is mandatory, after student's deliverance of the written assay.		
20.	Teaching language	English		
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> oral or written		
22.	Textbooks			
	22.1	Mandatory		
		1. Materials prepared by the course teachers.		
22.2	Additional			
		1. Rose E. Raskin, Denny J. Meyer: Canine and Feline Cytology: A Color Atlas and Interpretation Guide, Second Edition, 2010, Saunders, an imprint of Elsevier Inc.		

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Veterinary hematology
2.	Code	FVM020
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

6.	Study year / semester	Third year/ winter semester or Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is learning of physiology and pathology of the hematopoietic system and blood cells, i.e. all details which are not concerned in the compulsory course Pathophysiology.			
11.	<b>Brief content</b> Blood and bone marrow examination. Comparative hematology in domestic mammals. Comparative hematology in poultry and other mammals. Hematopoiesis. Coagulation and coagulation disorders. Platelets. Physiology of red blood cells and their changes in certain disease. Anemia and polycythemia. Hemolytic anemia. Depressive and hypoproliferative anemia. Granulocytes (neutrophils, eosinophils and mastocytes). Agranulocytes (monocytes and macrophages, lymphocytes and plasma cells). Interpretation of white blood cell parameters. Leukemia in domestic animals. Plasma proteins and dysproteinemias. Immunohematology.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	Method of assessment			
	Points gained by student's activities:			
			<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
	Attendance on seminars		4	15
	Activity (knowledge) on seminars		0	2.5
	Written essay		0	2.5
Final exam		0	80	
Total:		4	100	
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)
		from 51 to 60 points		6 (six) (E)
		from 61 to 70 points		7 (seven) (D)
		from 71 to 80 points		8 (eight) (C)
		from 81 to 90 points		9 (nine) (B)

		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Minimum points from the seminars is requirement for getting course teacher's signature at the end of the semester. The final exam is mandatory, after student's deliverance of the written assay.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> oral or written	
<b>22.</b>	<b>Textbooks</b>		
	<b>22.1</b>	<b>Mandatory</b>	
		1. Materials prepared by the course teachers	
<b>22.2</b>	<b>Additional</b>		
	1. Veterinary hematology and clinical chemistry / edited by Mary Anna Thrall [et al.]. – 2nd ed. 2012, John Wiley & Sons, Inc.		

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Tropical parasitic diseases</b>		
<b>2.</b>	<b>Code</b>	<b>FVM021</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fourth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>1.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Jovana Stefanovska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	The aim of the course is to introduce the students of veterinary medicine with the morphology and biology of parasites from tropical and subtropical areas, with their epizootiology (epidemiology), pathogenesis, clinical manifestation, as well as the methods of diagnostics, treatment and eradication of diseases they cause. Students will be familiarized with the clinical approach to parasite diseases important in public health and with their laboratory diagnostics. This subject will enable students to decide on the principle of overcoming and eradication of parasitological problems in tropical and subtropical areas independently.		
<b>11.</b>	<b>Brief content</b>	East Coast fever, malignant sheep thyleriosis. Trypanosomiasis (nagana, surra, goufar, murrina, derrengadera, mal de caderas, Chagas disease). Fasciolosis, clonorchiasis, paragonimiasis,		

	schistosomiasis. Eosinophilic meningoencephalitis, gnathostomiasis, dracunculosis. Dirofilariasis, elephantiasis, onchocerciasis, loiasis, stephanofilaria. Pulicosis ( <i>Tunga penetrans</i> ), myiasis ( <i>Dermatobia hominis</i> , <i>Cordylobia anthropophaga</i> , <i>Cochliomyia hominivorax</i> , <i>Lucilia</i> spp., <i>Calliphora</i> spp., <i>Phormia</i> spp., <i>Chrysomya</i> spp). <i>Auchmeromyia luteola</i> parasitism.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>	<b>25 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>15 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>10 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	12	15
		Written essay	6	10
		Tests (one)	42	75
	Final exam	Not predicted		
	Total:	60	100	
18.	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>
19.	<b>Requirement for signature and taking the final exam</b>	Final exam is actually one test.		
20.	<b>Teaching language</b>	<b>English</b>		
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Test (one):</b> written		
22.	<b>Textbooks</b>			
	22.1	<b>Mandatory</b>		

		G.D. Schmidt & L.S. Roberts: FOUNDATION OF PARASITOLOGY, Times Mirror/Mosby, 3 rd -5 th edition St. Louis - Santa Clara, 1985 - Singapor, 2000
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Rational application of antimicrobial drugs		
2.	Code	FVM022		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/ winter or summer semester	ECTS credit points	1.0
8.	Teacher	Prof. Romel Velev, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of this course is to acquaint the student the need for increased awareness in prescribing of antimicrobial drugs, to introduce the problem of antibiotic resistance and the basic principles of proper use of antimicrobial drugs integral as part of good veterinary practice.			
11.	<b>Brief content</b> Introducing the European platform for responsible use of the drugs in animals. Legislative for introducing the antimicrobial drugs in market. Obtaining health for the animals. Principles of appropriate use of antimicrobial drugs. Choice of the appropriate antibiotic. Monitoring of the antibiotic use. Antibiotic resistance. Antibiotic alternative and integrated programs for control of the diseases.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	25 hours		
14.	Organization of the course	Seminars: 1 hour per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	15 hours

16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	10 hours	
17.	Method of assessment				
	Points gained by student's activities:				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			Attendance and activity on seminars	24	30
			Written essay	6	10
			Tests (one)	30	60
		Final exam	Not predicted		
		Total:	60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)	
			from 51 to 60 points	6 (six) (E)	
			from 61 to 70 points	7 (seven) (D)	
			from 71 to 80 points	8 (eight) (C)	
			from 81 to 90 points	9 (nine) (B)	
			from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass the test.			
20.	Teaching language	English			
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Test (one):</b> written</p> <p><b>Final exam:</b> not predicted, except if student did not pass the test</p> <p><b>Complete exam:</b> not predicted</p>			
22.	Textbooks				
	22.1	Mandatory			
		<p>1. FVE: Antibiotic Resistance &amp; Prudent use of Antibiotics in Veterinary Medicine.</p> <p>2. EPRUMA: Best Practice Framework for the use of Antimicrobials in Food-Producing Animals in the EU.</p>			
22.2	Additional				

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Cynology		
2.	Code	FVM023		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Ass. Prof. Elena Atanaskova Petrov, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b></p> <p><b>Definition of the course:</b> Through this module student gains knowledge from cynology, about history of the cynology organization and their work in the world and in our country; cynology associations, breed classification, breeding dogs, hygiene of the coat, diet, accommodation.</p> <p><b>Position of the course in veterinary education:</b> with this subject, students extend their knowledge about dog's breeds. Detail describing the existence of different groups of dogs by their international classification specificity in groups and specificity of each breed individually. This approach allows students to recognize and differentiate the diseases connected with each breed.</p> <p><b>Relations of the course with the curriculum:</b> The topics that are subject of presentation include the characteristics of the body in different dog breeds. Also, are described the breed's standards in relation to structure of the body, skin, coat, color and other specific signs for the breed.</p>			
11.	<p><b>Brief content</b></p> <p><b>Seminars</b> Introduction in cynology, organizations. Division of dog breeds according to FCI-classification. Yugoslavian Shepherd Dog origin and characteristics. Breeding dogs (sexual maturation, offspring, mating, pregnancy, delivery, care for the offspring – critical periods, marking the offspring). Breeding dogs and dog training. Hygiene of the coat and diet specialties. Nutrition of the litter and young dogs. Accommodation of dogs.</p> <p><b>Practicals</b> Each student will be required to prepare written essay about one of the FCI groups or about characteristics of certain dog breed. Field practice – visiting and participating on cynology exhibitions.</p>			
12.	<p><b>Methods of studying</b></p> <p>Seminars: making discussions about breeding, description of some breeds, using video materials Written essay: every student prepares a essay about animal category or about certain breed; oral presentation by the students. Field practice: Active participation and presentation of student's participation on a cynologic exhibition.</p>			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 21 hour Field practice: 9 hours		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	

16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	20 hours
17.	Method of assessment			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity on seminars and field practice	14	21
	Written essay	5	9	
	Final exam	Predicted		
	Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	
		from 61 to 70 points	7 (seven) (D)	
		from 71 to 80 points	8 (eight) (C)	
		from 81 to 90 points	9 (nine) (B)	
		from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is predicted. Criterion for reaching the final exam is gaining of 50% of points predicted with seminars, written essay and field practice.		
20.	Teaching language	English		
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> student obligatory reaches the final exam orally or written.		
22.	Textbooks			
	22.1	Mandatory		
		1. The Kennel Club's Illustrated Breed Standards The official guide to registered breeds Ebury Press, London 2003		
22.2	Additional			

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Marketing of veterinary practice
2.	Code	FVM024
3.	Study program	Veterinary medicine

4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Second year/ summer semester</b>	<b>ECTS credit points</b>	<b>1.0</b>
8.	<b>Teacher</b>	<b>Prof. Blagica Sekovska, PhD</b>		
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b>  This course has aim to introduce the students with basis of marketing in veterinary practice. That means that students have to get basic knowledge for their future becoming part of the economy with establishment of private veterinary practice. This course is closely related and compatible with the compulsory course Basis of management and management of veterinary practice. Both these courses would obtain to the students to attract as possible as it get more clients, as well as to keep them. The future doctor of veterinary medicine has to get basic knowledge about expectations of his/her clients, how to improve his/her practice and to make as possible as it get higher profit. For this goal some basic knowledge is necessary about clients behavior, nature and features of offered service, modes how prices could and have to be made, channels for distribution of information to the client, i.e. how marketing instruments to be successfully used for practice managing.</p>			
11.	<p><b>Brief content</b>  Introduction. Marketing environment in veterinary practice. Knowing the clients of veterinary practice. Marketing instruments in most successful ranking on the market. Veterinary service market. Significance and development of marketing strategies. Types of marketing strategies suitable for veterinary practice. How to research service market. Organization and control of marketing activities.</p>			
12.	<p><b>Methods of studying</b>  Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice.  Written essay: learning with use of referent textbooks and internet, preparing written essay.</p>			
13.	<b>Total available time</b>	<b>25 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>15 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>10 hours</b>
17.	<b>Method of assessment</b>			

	Points gained by student's activities:		
	Type of activity	Points	
		minimum	maximum
	Attendance and activity on seminars	20	26
	Written essay	10	14
Tests (two)	/	30(x2)=60	
Final exam	-		
Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	Final grade mark is made with summerasing points according the table of activities mentioned above.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam (optional):</b> oral or written (includes one test)	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>Robin Brogdan:101 Veterinary Marketing Questions Answered, 2011</li> <li>K.H. Lovelock, J.Wirtz: Services Marketing, 2011</li> <li>Shawn P. Messonier: Marketing Your Veterinary Practice, Misury, 2000</li> </ol>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Current food safety systems		
2.	Code	FVM025		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Pavle Sekulovski, PhD		

		<b>Prof. Dean Jankuloski, PhD</b> <b>Ass. Prof. Sandra Mojsova, PhD</b> <b>Ass. Prof. Mirko Prodanov, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> Aim of this course is that students get advanced knowledge about Contemporary systems for food safety. During the course they will learn with all new food safety systems and pre-requisites also like GMP, GHP, GAP, HACCP, TQM, LISA. The implementation of those systems in different fields of food industry will be presented with practical examples. They will have the opportunity to elaborate different HACCP plans by themselves (by written essays).			
<b>11.</b>	<b>Brief content</b> Current systems for food safety. Good manufacturing practice. Good hygienic practice. Good agriculture practice. History of HACCP system. Aims of HACCP system. Seven HACCP principles. Generic HACCP plans. HACCP implementation on farms. HACCP implementation in slaughterhouses. HACCP implementation in meat processing. HACCP implementation in milk processing. HACCP implementation in fish processing. Connection between HACCP and TQM. HACCP and TQM for retail and catering. HACCP and consumers. Predictive microbiology and HACCP. Risk analyses, HACCP and microbiological criteria in food industry.			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	<b>20 hours</b>
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<b>Minimum</b>	<b>Maximum</b>
		<b>Attendance on seminars</b>	<b>24</b>	<b>30</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
		<b>Tests (two)</b>	<b>15(x2)=30</b>	<b>30(x2)=60</b>
	<b>Final exam</b>	<b>Not predicted</b>		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>

		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam (optional):</b> oral or written (includes one test)	
<b>22.</b>	<b>Textbooks</b>		
	<b>22.1</b>	<b>Mandatory</b>	
		<ol style="list-style-type: none"> <li>1. Corlett, D. A. (1998) HACCP Users Manual</li> <li>2. Forsythe, S. J., Hayes, P.R. (1998) Food Hygiene, Microbiology and HACCP</li> <li>3. Morrtimeore, S., Wallace, C. (1998) HACCP A practical Approach</li> <li>4. Pearson, A.M., Dutson, T.R. (1999) HACCP in Meat, Poultry and Fish Processing: Advances in Meat Research Series Vol.10</li> </ol>	
<b>22.2</b>	<b>Additional</b>		

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Management of animal products supply chains</b>		
<b>2.</b>	<b>Code</b>	<b>FVM026</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fourth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>1.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Blagica Sekovska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> Supply chains are actual topic in EU. One of the basic tasks of veterinary profession is to observe animal products through these chains starting with production itself, and up to final consummation of the product. Because of that, it is necessary to know all rules and economic aspects of these chains. The aim of this course is to introduce in detail the future veterinarian with supply chains, their importance, meaning, economic aspects, organization rules and regulation. This course is especially recommended for students who would work in domain of veterinary inspection and veterinary administration.			
<b>11.</b>	<b>Brief content</b> Definition of animal products supply chains. Types of animal products supply chains. Measures for improvement of animal products supply chains. Distribution of animal products. Types of distribution.			

	Transport and logistics. Planning of animal products supply chains. Making decisions about animal products supply chains (financial decisions, security decisions, strategic decisions etc.). Organization of animal products supply chains. Control of animal products supply chains.																						
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.																						
<b>13.</b>	<b>Total available time</b>	<b>25 hours</b>																					
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours)																					
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>																				
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																				
			<b>15 hours</b>																				
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																				
		<b>16.2</b>	<b>Individual tasks</b>																				
		<b>16.3</b>	<b>Self-directed learning</b>																				
			<b>10 hours</b>																				
<b>17.</b>	<b>Method of assessment</b>																						
	Points gained by student's activities:																						
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th>Minimum</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>Attendance on seminars</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>6</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>15(x2)=30</td> <td>30(x2)=60</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Not predicted</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		Minimum	Maximum	Attendance on seminars	24	30	Written essay	6	10	Tests (two)	15(x2)=30	30(x2)=60	Final exam	Not predicted		<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																						
	Minimum	Maximum																					
Attendance on seminars	24	30																					
Written essay	6	10																					
Tests (two)	15(x2)=30	30(x2)=60																					
Final exam	Not predicted																						
<b>Total:</b>	<b>60</b>	<b>100</b>																					
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>																					
		<b>5 (five) (F)</b>																					
		<b>from 51 to 60 points</b>																					
		<b>6 (six) (E)</b>																					
		<b>from 61 to 70 points</b>																					
		<b>7 (seven) (D)</b>																					
<b>from 71 to 80 points</b>																							
<b>8 (eight) (C)</b>																							
<b>from 81 to 90 points</b>																							
<b>9 (nine) (B)</b>																							
<b>from 91 to 100 points</b>																							
<b>10 (ten) (A)</b>																							
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.																					
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																					
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: General on animal products supply chains Second test: Strategic decisions on animal products supply chains <b>Final exam (optional):</b> oral or written (includes one test)																					
<b>22.</b>	<b>Textbooks</b>																						

		<b>Mandatory</b>	
	<b>22.1</b>	1. Y. Narahari and S. Biswas: Supply Chain Management: Modeling and Decision Making, Indian Institute of Science, Bangalore	
	<b>22.2</b>	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Microbiology of food		
2.	Code	FVM027		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Pavle Sekulovski, PhD Prof. Dean Jankuloski, PhD Ass. Prof. Sandra Mojsova, PhD Ass. Prof. Mirko Prodanov, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is that the students are gained with thorough theoretical and practical knowledge of food microbiology. The seminars include a review of the fundamentals of food microbiology, the metabolism of the microorganisms, the mechanisms of their growth, reproduction and extinction and the factors which influence them. Students will be acquainted in details with the types of microorganisms and their characteristics and the hazards they pose to the human health. During practicals students will be introduced with the routine and advanced methods for the detection of the microorganisms as well with the rapid and automatic methods in food microbiology.			
11.	<b>Brief content</b> Development and evolution of the food microbiology. General principles of the growth and development of the microorganisms. Dynamic factors in the growth of the microorganisms. Dynamics of the microorganisms extinction. Interaction between the factors affecting the survival of the microorganisms. Microorganisms that spoil the food. Food poisoning. Pathogenic bacteria in the food. Mycotoxigenic moulds. Viruses. Parasites in food and water. Indicator microorganisms. Fermentation of the food. Control of microbiological quality and the food safety. Microbiological criteria. Routine methods in the food microbiology. Quick methods and automation. Advanced methods in the food microbiology.			
12.	<b>Methods of studying</b> Seminars: lectures in large group with discussion and active participation of the students			

	Practicals: laboratory practicals in microbiology of food; Active participation of the students in laboratory work on microorganism isolation and identification. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
			<b>20 hours</b>	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<b>Minimum      Maximum</b>	
		Attendance on seminars	<b>12              15</b>	
		Attendance on practicals	<b>12              15</b>	
		Written essay	<b>6                10</b>	
		Tests (two)	<b>15(x2)=30      30(x2)=60</b>	
		Final exam	<b>Not predicted</b>	
		<b>Total:</b>	<b>60              100</b>	
18.	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
19.	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.		
20.	<b>Teaching language</b>	<b>English</b>		
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: basis of microbiology of food Second test: advanced microbiology of food <b>Final exam (optional):</b> oral or written (includes one test)		
22.	<b>Textbooks</b>			
	22.1	<b>Mandatory</b>		

		<ol style="list-style-type: none"> <li>1. Eley, A. R. (1996) Microbial Food Poisoning</li> <li>2. Garbutt, J. (1997) Essentials of Food Microbiology</li> <li>3. Doyle, M.P., Beuchat, L.R., Montville, T.J.(2007) Food Microbiology: Fundamentals and Frontiers</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Technological processes on a poultry farm		
2.	Code	FVM028		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Aleksandar Dodovski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> Aim of the course is to give the students theoretical basis for the practical way of running a poultry farm and to familiarize with technological processes in all phases of production of different economic categories. Seminars include demonstration of basic technological processes starting from parent stock, hatchery, day old chicks to commercial farms for rearing and exploitation of broilers and table egg layers. During the course clinical problems from everyday farm life will be solved in team work. Also, the student will have oral presentation of the teaching unit by his/her choice.			
11.	<b>Brief content</b> Technology of production of parent stocks. Technology in incubation station. Technology of breeding chicks and replacement pullets. Technology of production of table egg layers. Technology of production of broilers. Documentation on poultry farm.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours

16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	20 hours	
17.	Method of assessment				
	Points gained by student's activities:				
			<i>Type of activity</i>	<i>Points</i>	
				Minimum	Maximum
			Attendance on seminars	24	30
			Written essay	6	10
			Tests (two)	15(x2)=30	30(x2)=60
		Final exam	Not predicted		
		Total:	60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)	
			from 51 to 60 points	6 (six) (E)	
			from 61 to 70 points	7 (seven) (D)	
			from 71 to 80 points	8 (eight) (C)	
			from 81 to 90 points	9 (nine) (B)	
			from 91 to 100 points	10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass one of the tests.			
20.	Teaching language	English			
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Technology of production of parent stocks, technology in incubation station</p> <p><b>Second test:</b> Technology of breeding chicks and replacement pullets, technology of production of table egg layers, technology of production of broilers, documentation on poultry farm</p> <p><b>Final exam:</b> oral or written</p>			
22.	Textbooks				
	22.1	Mandatory			
		<ol style="list-style-type: none"> <li>1. Management handbooks of different breeding companies (parent stock, broilers, layers, hatchery manuals)</li> <li>2. Commercial Chicken Meat and Egg Production, 5<sup>th</sup> edition, 2002 Springer Science and Business Media New York</li> </ol>			
22.2	Additional				

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Aquaculture		
2.	Code	FVM029		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b>  <i>Seminars</i> of course Aquaculture have aim to introduce the students with meaning of aquaculture in our country and in the world, basis of ecology of the aquatic ecosystems, main terms in aquaculture, breeding of commercially most important species of warmwater and coldwater fish, health protection of fish in aquacultural production and breeding of crustaceans and frogs.  With this course the future doctor of veterinary medicine would get knowledge about breeding of most important species of warmwater and coldwater fish species, basic principles of health protection of fish and breeding techniques for crustaceans and frogs, as well as ability for giving advices for promotion of optimal aquacultural production and health of breded animals.  <i>Field practice</i> in this course has aim to introduce the students with all fish species breded in Republic of Macedonia, basics of anatomy and physiology of fish, choice of location of pond, quality and quantity of water for aquaculture, dimensioning of the pond, planning of fish production, nutrition of fish and transport of fish and reproductive material.</p>			
11.	<p><b>Brief content</b>  <b>Seminars</b>  Definition and significance of aquaculture. Basis of aquatic ecosystems ecology. Basic terms in aquaculture. Breeding of warmwater fish species. Breeding of coldwater fish species. Health care of fish in aquacultural production. Breeding of crustaceans. Breeding of frogs.  <b>Field practice</b>  Visit of dirt pond for breeding of carp. Visit of cage pond for breeding of carp/trout. Visit of trout pond.</p>			
12.	<p><b>Methods of studying</b>  Seminars: work with large group with discussion and engagement of students  Field practice: Visits of fish ponds  Written assay: learning with use of referent textbooks and internet, preparing written assay; presentation and discussion about the written assay</p>			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 24 hours Field practice: 6 hours		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	

<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on seminars</b>	<b>12</b>	<b>15</b>
		<b>Attendance on field practice</b>	<b>12</b>	<b>15</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>First test</b>	<b>15</b>	<b>30</b>	
	<b>Second test</b>	<b>15</b>	<b>30</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	<p>With gaining up to 60 points from attendance on seminars and field practice, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Definition and significance of aquaculture, basis of aquatic ecosystems ecology, basic terms in aquaculture, breeding of warmwater fish species, fish species bred in Republic of Macedonia, basis of anatomy and physiology of fish, choice for location of pond, water quality and quantity for aquaculture</p> <p><b>Second test:</b> Breeding of coldwater fish species, health care of fish in aquacultural production, breeding of crustaceans, breeding of frogs, dimensioning of pond, planning of fish production, nutrition of fish, transport of fish and reproductive material.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contains practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<p><b>Textbooks</b></p> <table border="1"> <tr> <td>22.1</td> <td> <p><b>Mandatory</b></p> <p>1. Pillay T.V.R.: <b>Aquaculture: Principles and Practices</b>. Fishing News Books, Osney Mead, Oxford OX2 0EL, England, 1993.</p> <p>2. Stickney R.R.: <b>Encyclopedia of aquaculture</b>. John Wiley &amp; Sons, Inc. New York, USA, 2000.</p> </td> </tr> <tr> <td>22.2</td> <td> <p><b>Additional</b></p> </td> </tr> </table>	22.1	<p><b>Mandatory</b></p> <p>1. Pillay T.V.R.: <b>Aquaculture: Principles and Practices</b>. Fishing News Books, Osney Mead, Oxford OX2 0EL, England, 1993.</p> <p>2. Stickney R.R.: <b>Encyclopedia of aquaculture</b>. John Wiley &amp; Sons, Inc. New York, USA, 2000.</p>	22.2	<p><b>Additional</b></p>											
22.1	<p><b>Mandatory</b></p> <p>1. Pillay T.V.R.: <b>Aquaculture: Principles and Practices</b>. Fishing News Books, Osney Mead, Oxford OX2 0EL, England, 1993.</p> <p>2. Stickney R.R.: <b>Encyclopedia of aquaculture</b>. John Wiley &amp; Sons, Inc. New York, USA, 2000.</p>															
22.2	<p><b>Additional</b></p>															

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Clinical pharmacology
2.	Code	FVM030
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Romel Velez, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to give students a theoretical basis for practical clinical pharmacology. Seminars include review of the fundamentals of pharmacokinetics, drug metabolism, mechanism of action of the drug receptor, interaction among drugs, and presentation of selected drugs commonly used in veterinary clinical practice. In this way students will be allowed to obtain performance of different groups of veterinary drugs. During the course clinical problems exposed in the form of examples from everyday veterinary practice will be resolved. Also the student will have an oral presentation to the chapter he/she chooses.			
11.	<b>Brief content</b> <i>Seminars from the basic pharmacology:</i> The pharmacokinetic and dosing of drugs. The pharmacokinetic basis of species variations in drug disposition. The concept of bioavailability and application to veterinary dosage forms. Interpretation of changes in drug disposition and interspecies scaling. Some aspects of dosage, clinical selectivity and stereoisomerism. Drug permeation through the skin and topical preparations. Antimicrobial disposition, selection, administration and dosage. The bioavailability and disposition of antimicrobial agents in neonatal animals. Legal requirements for clinical examination of new veterinary drugs. Drug residues and the determining of the withdrawal period for drugs. <i>Seminars based on clinical practice cases:</i> Drugs acting on the digestive system and metabolism. Fluid and electrolyte therapy. Drugs acting on the heart and circulation. Antibiotics and chemotherapeutics. Anti-inflammatory drugs. Hypnotics, sedatives and anesthetics. Anthelmintics and ectoparasiticides. Hormones affecting reproduction. Dermatological drugs. Ophthalmic drugs. Analgesics.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	20 hours
17.	Method of assessment			

	Points gained by student's activities:		
	<i>Type of activity</i>	<i>Points</i>	
		<i>minimum</i>	<i>maximum</i>
	Attendance and activity on seminars	24	30
	Written essay	6	10
	Tests (two)	15(x2)=30	30(x2)=60
Final exam	Not predicted		
Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass one of the tests.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: basic pharmacology Second test: cases from the clinical practice <b>Final exam:</b> oral or written (includes one test)	
22.	Textbooks		
	22.1	Mandatory	
		1. Baggot, D. J.: The Physiological Basis of Veterinary Clinical Pharmacology. Blackwell Science Ltd, 2001.	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Chemistry of food quality
2.	Code	FVM031
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Zehra Hajrulai-Musliu, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b>  Food chemistry is one of the largest parts of food science. This course aims to familiarize students with the role and significance the composition and properties of nutritional components, chemical changes that affect during storage and preparation process; introduction to nutritional value, quality and safety of foods are so understanding that the quality and safety of food depends on the chemical and physical processes.</p>			
11.	<p><b>Brief content</b>  <b>Seminars</b>  Introduction in food chemistry. Energy value of food. Nutrients: carbohydrates, lipids, proteins. Micro and macro elements in food products. Vitamins. Chemical contamination on food. Additives in food products. Dietary foods. Biotechnology of food. Drinking water. Interaction of food ingredients and drugs. Object of general use.</p> <p><b>Practicals</b>  Determination of total protein in food products by Kjeldahl. Identification and determination of amino acids with amino-analyser. Determination of fat in food products by Sochlet. Identificaon and determination of fatty acids by gas chromatography. Determination of mono and oligosaccharides with Felling test. Polarimetric determination of sucrose. Determination of vitamin C. Determination of organochlorine pesticides. Preparation of food samples for determination of residues of metals and metalloids by the “dry burning” method. Additives. Evidence of artificial pigments. Evidence of preservatives (nitrates, nitrites, sulphites, boric acid, formaldehyde, sorbic acid and benzoate). Evidence of antioxidants, artificial sweeteners. Drinking water. Determination of pH. Determination of residual chlorine. Determination of chloride. Determination of reduction power of water. Determination of nitrogen compounds in water – ammonia, nitrite, and nitrate. Determination of alkalinity and hardness of water. Consumption of potassium permanganate. Analysis of the composition of dietary products aimed at assessing the energy and biological value. Items for general use.</p>			
12.	<p><b>Methods of studying</b>  Seminars: work in group with discussion and active participation of the students  Practicals: laboratory practicals and other types of work in smaller groups  Written essay: learning with use of referent textbooks and internet, preparing seminar work; presentation and discussion about the written essay</p>			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	

17.	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
			<i>Points</i>		
	<i>Type of activity</i>		<i>minimum</i>	<i>maximum</i>	
	Attendance on seminars		12	15	
	Attendance and activity (knowledge) on practicals		12	15	
	Written essay		6	10	
Tests (two)		15(x2)=30	30(x2)=60		
Final exam		Not predicted			
Total:		60	100		
18.	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>		<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
19.	<b>Requirement for signature and taking the final exam</b>		<p>Besides attendance on seminars and practicals, additional condition for course teacher's signature at the end of the semester, is passing of two tests during the semester with up to 25% points gained per test.</p> <p>Final exam is not predicted. Student who did not pass one of tests during the semester goes to one of the tests during the exam sessions.</p>		
20.	<b>Teaching language</b>		<b>English</b>		
21.	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> not predicted  <b>Complete final exam:</b> not predicted</p>		
22.	<b>Textbooks</b>				
	22.1	<b>Mandatory</b>			
		<ol style="list-style-type: none"> <li>1. Food Analysis Theory and practice Third edition Yeshajahu Pomeranz Clifton E. Meloan New York – London 1994</li> <li>2. Applications in Medicinal Nutrition Therapy, Frances J. Zeman, Denise M. Ney, 1996.</li> </ol>			
	22.2	<b>Additional</b>			

Attachement No. 3		First, second and third cycle course program				
1.	Program course title	Reconstructive surgery of the integumentary system				
2.	Code	FVM032				
3.	Study program	Veterinary medicine				
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje				
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies				
6.	Study year / semester	Fourth year/ winter or summer semester	ECTS credit points	1.0		
8.	Teacher	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD				
9.	Preconditions					
10.	<b>Program course goals (competencies):</b> The aim of the course is to give the students a fundamental theory for implementation of specific surgical treatments of skin disease in daily practice. With this course students will be able to expand their previous knowledge of anatomy and general surgery. Students will have the opportunity to carry out individual examination and practical work on selected clinical problems.					
11.	<b>Brief content</b> Principles of plastic and reconstructive surgery. Surgical management of specific integument diseases. Surgery of distal limb (digits and footpad).					
12.	<b>Methods of studying</b> Independently performing of surgical procedures under the qualified supervision and preparing the written essay by using referent textbooks and internet in order to encourage the student for independent work and research.					
13.	Total available time	25 hours				
14.	Organization of the course	Practical work: 1 hour/per week (15 hours)				
15.	Forms of teaching activities	15.1	Lectures - theory classes	15 hours		
		15.2	Practicals (laboratory, auditorial), seminars, team work			
16.	Other forms of activities	16.1	Project tasks	10 hours		
		16.2	Individual tasks			
		16.3	Self-directed learning			
17.	Method of assessment					
	Points gained by student's activities:					
			<i>Type of activity</i>		<i>Points</i>	
					<i>minimum</i>	<i>maximum</i>
			Attendance and activity (knowledge) on practical work		8	15
			Written essay		52	85
		Final exam		Not predicted		
		Total:		60	100	
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)		
			from 51 to 60 points	6 (six) (E)		
			from 61 to 70 points	7 (seven) (D)		

		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
<b>22.1</b>	<ol style="list-style-type: none"> <li>1. Slatter Douglas, <i>Textbook of small animal surgery</i> 2nd edition, 2002 Saunders;</li> <li>2. Fossum Theresa W., <i>Small animal surgery</i> 2nd ed., 2002 Mosby;</li> <li>3. Harari J. <i>Small animal surgery</i> 1996 Williams &amp; Wilkins;</li> <li>4. Binnington A.G., <i>Decision making in a small animal soft tissue surgery</i> 1988,</li> <li>5. Newton., Swaim S. F. Henderson R. A. <i>Small animal wound management</i> 1997 Williams &amp; Wilkins</li> </ol>		
	<b>Additional</b>		
<b>22.2</b>			

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Selected surgical procedures in ophthalmology</b>		
<b>2.</b>	<b>Code</b>	<b>FVM033</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fourth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>1.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	The aim of the course is to give theoretical basis for practical application of specific surgical procedures in ophthalmology. Also, the students will be able to expand their previously acquired knowledge of anatomy, pathology and physiology, general surgery and the fundamentals of veterinary ophthalmology in order to provide correct diagnosis and treatment of ophthalmic diseases. Students will have the opportunity for carrying out individual examination and practical work on selected clinical problems.		
<b>11.</b>	<b>Brief content</b>	Specific surgical techniques of the eyelids. Specific surgical techniques of third eyelid. Surgical treatment of cataract. Specific surgical techniques of the eye globe.		
<b>12.</b>	<b>Methods of studying</b>			

	Independently performing of surgical procedures under the qualified supervision and preparing the written essay by using referent textbooks and internet in order to encourage the student for independent work and research.			
<b>13.</b>	<b>Total available time</b>	<b>25 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Practical work: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>15 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>10 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance and activity (knowledge) on practical work</b>	<b>8</b>	<b>15</b>
	<b>Written essay</b>	<b>52</b>	<b>85</b>	
	<b>Final exam</b>	<b>Not predicted</b>		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		<ol style="list-style-type: none"> <li>Simon M., Petersen-Jones., Sheila M. Crispin. <i>Manual of small animal ophtalmology</i>, 1997, BSAVA</li> <li>Kirk N. Gelatt, <i>Essentials of veterinary ophtalmology</i>, 2005, Blackwell Publishing</li> <li>Douglas Slatter., <i>Fundamentals of Veterinary ophtalmology</i>, 2001, third edition, W.B. Saunders</li> </ol>		
<b>22.2</b>	<b>Additional</b>			

--	--

Attachement No. 3		First, second and third cycle course program			
1.	Program course title	Selected techniques for surgical fracture reduction			
2.	Code	FVM034			
3.	Study program	Veterinary medicine			
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje			
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies			
6.	Study year / semester	Fourth year/ winter or summer semester	ECTS credit points	1.0	
8.	Teacher	Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD			
9.	Preconditions				
10.	<b>Program course goals (competencies):</b> The aim of the course is to enable the students to expand and apply their previously acquired knowledge of anatomy, general surgery and orthopedics. Students will have the opportunity to gain appropriate knowledge necessary for proper diagnosis and treatment of injuries at the locomotory system and practical work in selected clinical problems.				
11.	<b>Brief content</b> Techniques of surgical fracture reduction of certain bones.				
12.	<b>Methods of studying</b> Independently performing of surgical procedures under the qualified supervision and preparing the written essay by using referent textbooks and internet in order to encourage the student for independent work and research.				
13.	Total available time	25 hours			
14.	Organization of the course	Practical work: 1 hour/per week (15 hours)			
15.	Forms of teaching activities	15.1	Lectures - theory classes		
		15.2	Practicals (laboratory, auditorial), seminars, team work	15 hours	
16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	10 hours	
17.	<b>Method of assessment</b>				
	Points gained by student's activities:				
		Type of activity		Points	
			minimum	maximum	
		Attendance and activity (knowledge) on practical work	8	15	
	Written essay	52	85		
	Final exam	Not predicted			
	Total:	60	100		

18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	Final exam is not predicted.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>Slatter Douglas, <i>Textbook of small animal surgery</i> 2nd edition, 2002 Saunders;</li> <li>Fossum Theresa W., <i>Small animal surgery</i> 2nd ed., 2002 Mosby,;</li> <li>Perimatei D., Flo G., DeCamp C. <i>Small animal orthopedics and fracture repair</i> 2006 Saunders;</li> <li>Harari J. <i>Small animal surgery</i> 1996 Williams &amp; Wilkins;</li> <li>Bojrab Joseph M, <i>Current techniques in small animal surgery</i> 2 nd edition, 1983 Lea&amp;Febiger,</li> <li>Newton C. D. Nunamaker D. M. Textbook of small animal orthopedics <a href="http://cal.nbc.upenn.edu/saortho/index/html">http://cal.nbc.upenn.edu/saortho/index/html</a></li> </ol>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Advanced reproductive endocrinology		
2.	Code	FVM035		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD		
9.	Preconditions			
10.	Program course goals (competencies):	The aim of the course is to obtain fundamenals for possibilities of practical application of reproductive endocrinology. The students will upgrade their previous knowledge from the course Reproduction. They will be able for individual work in realization of individual treatments for estrus synchronization and ovulation, partus synchronization, induction of lactation, superovulation treatments etc.		
11.	Brief content	Estrus and ovulation synchronization methods. Partus synchronization methods. Superovulation		

	provocation methods.			
<b>12.</b>	<b>Methods of studying</b> Independently performing treatments under expert supervision and preparation of seminar paper using professional literature and internet, in order to encouraging the student for independent work and research.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Practical work: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity (knowledge) on practical work	8	15
		Written essay	52	85
	Final exam	Not predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
		<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>Laboratory Production of Cattle Embryos: I. Gordon, Published by CABI Publishing, 2003; ISBN 0851996663, 9780851996660 ;</li> <li>Internet web sites recommended by the course teachers</li> </ol>		
<b>22.2</b>	<b>Additional</b>			


Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Clinical nutrition of dogs and cats		
2.	Code	FVM036		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Ass. Prof. Elena Atanaskova Petrov, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b></p> <p><b>Definition of the course:</b> In the last few years basic principles of clinical nutrition of dogs and cats has been developed. With current information about clinical nutrition of the pets, are created needs for learning of different nutritional needs and the mental framework of the needs related to the metabolism and specific nutritional elements. Disciplines and scientific researches that are applied on the basic methods of nutrition in dogs and cats began to apply recently, and are used from clinical aspect of the nutrition.</p> <p><b>Position of the course in veterinary education:</b> Given the advanced information about the relationship of clinical nutrition and metabolic needs of the sick dogs and cats, the need of studying this course is obvious after overcoming some courses related with the diseases of these animals. Certainly the topics that are taught will help students to understand basic principles of nutrition regarding the pathological conditions that are present in the affected animal, the method of application and duration of the special type of diet.</p> <p><b>Relations of the course with the curriculum:</b> Topics of study in this course complement the knowledge obtained by studying clinical courses. Also, it's recommended that this course should be heard after solving courses related with surgery.</p> <p>The materials of this course are divided into two parts: the first part concerns the elucidation of the basic principles of clinical nutrition - to be overcome in the seminars; the second part refers to the practical part of clinical nutrition - to be overcome during the practicals that will be required for the students themselves, through enhanced activity.</p>			
11.	<p><b>Brief content</b></p> <p><b>Seminars</b></p> <p>During the seminars, basic principles of clinical nutrition are going to be explained: imbalanced nutrition: importance of the balanced nutrition; nutrition of hospitalized dogs and cats; nutrition at intensive care; techniques for intestinal nutrition support; nutrition in oncology diseases; dealing with the foods; overweight; allergies' nutrition.</p> <p><b>Practicals</b></p> <p>In this part students will actively participate in preparing themes related to preparation of clinical nutrition, in regard to: nutrition of dogs and cats with digestive disorders; nutrition in liver diseases; nutrition of dogs and cats with renal failure; nutrition of dogs and cats with lower urinary tract disorders; nutrition at cardiovascular disorders; nutrition in integument disorders.</p>			

<b>12.</b>	<b>Methods of studying</b> Seminars: work in group with discussion and active participation of the students, using video materials Practicals: preparing of topics related with the practical application of clinical nutrition, active participation and preparation of recommendation for nutrition in certain clinical cases.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	20	30
		Attendance and activity (knowledge) on practicals	6	10
	Final exam	Predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is predicted. Criterion for reaching the final exam is gaining of 50% of points predicted with seminars and practicals.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> student obligatory reaches the final exam orally or written.		
<b>22.</b>	<b>Textbooks</b>			
		<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>The Waltham book of Clinical nutrition of the dog and cat by Josephine M. Wills &amp; Kenneth W. Simpson, Butler&amp;Turner ltd 1994</li> <li>Applied clinical nutrition of the dog an cat Third edition P.J. Markwell &amp;K Hurley 2001</li> </ol>		

	22.2	Additional

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Tropical infectious diseases		
2.	Code	FVM037		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Ass. Prof. Kiril Krstevski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to introduce the students with specific features of the tropical diseases, their prevalence, as well as meaning and modes of regional and global control of these diseases.			
11.	<b>Brief content</b> African horse sickness. African swine fever. Lumpy skin disease. Bluetongue. Rinderpest. Rift Valley fever. Peste des petits ruminants. Nairobi sheep disease. Dermatophilosis. Q fever. Bovine contagious ceratoconjunctivitis. Anaplasmosis. Heartwater. Epizootic lymphangitis. Contagious bovine pleuropneumonia.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	Method of assessment			

Points gained by student's activities:			
	Type of activity	Points	
		minimum	maximum
	Attendance and activity on seminars	35	45
	Written assay	0	5
	Tests (two)	10	20
	Final exam	15	30
	Complete final exam	<b>Grade mark</b>	<b>Points</b>
		Six (6)	20
		Seven (7)	25
		Eight (8)	30
		Nine (9)	35
	Ten (10)	43	
	<b>Total:</b>	<b>60</b>	<b>100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	For being able to reach the final exam student has to gain up to 40 points from seminars and the two tests. If student does not show result on the one of the tests, but has gained points only on seminars, he/she has to go on complete final exam.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam:</b> written-oral <b>Complete final exam:</b> oral+written	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>Berislav Jukic: Tropske zarazne bolesti zivotinja. Veterinarski fakultet Sveucilista u Zagrebu, 2003.</li> <li>W.A. Geering, A.J. Forman and M.J. Nunn: Exotic diseases of animals. Australian Government Publishing Service Beograd, Canberra, 1995.</li> </ol>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Breeding and diseases of ostriches
2.	Code	FVM038

3.	<b>Study program</b>		<b>Veterinary medicine</b>	
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>		<b>Faculty of Veterinary Medicine - Skopje</b>	
5.	<b>Degree of education (first, second, third cycle)</b>		<b>First and second cycle integrated studies</b>	
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>		<b>Prof. Aleksandar Dodovski, PhD</b>	
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b>  Aim of the course is to give the students theoretical basis for the production and diseases which affect ostriches. Seminars include demonstration of basic basics of anatomy and physiology of ostriches, production systems, prevention of diseases, specific immunoprophylaxis, and diseases of different etiology and their therapy.  During the course clinical problems from everyday practice will be solved in team work. The student will have oral presentation of the teaching unit by his/her choice.</p>			
11.	<p><b>Brief content</b>  Basics of anatomy and physiology of ostriches. Ostrich breeding. Production of breeding stock. Hatching eggs procedures. Production of juveniles. Biosecurity measures. Bacterial diseases. Viral diseases. Mycotic diseases. Parasitic diseases. Avitaminoses. Metabolic disorders. Poisonings.</p>			
12.	<p><b>Methods of studying</b>  Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice.  Written essay: learning with use of referent textbooks and internet, preparing written essay.</p>			
13.	<b>Total available time</b>		<b>50 hours</b>	
14.	<b>Organization of the course</b>		Seminars: 2 hours/per week (30 hours)	
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>20 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	Points gained by student's activities:			
			<i>Points</i>	
	<i>Type of activity</i>		<i>minimum</i>	<i>maximum</i>
	Attendance and activity on seminars		24	30
	Written essay		6	10
Tests (two)		15(x2)=30	30(x2)=60	
Final exam		Not predicted		
Total:		60	100	
18.	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p>First test: Basics of anatomy and physiology of ostriches, ostrich breeding, biosecurity measures</p> <p>Second test: Bacterial diseases, Viral diseases, mycotic diseases, parasitic diseases, avitaminoses, metabolic disorders, poisonings</p> <p><b>Final exam (optional):</b> oral or written</p>	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
	<b>22.1</b>	Ostrich Diseases - F. W. Huchzermeyer, Onderstepoort Veterinary Institute, 1994	
	<b>Additional</b>		
	<b>22.2</b>		

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Breeding and diseases of pigeons</b>		
<b>2.</b>	<b>Code</b>	<b>FVM039</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Aleksandar Dodovski, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>	<p>Aim of the course is to give the students theoretical basis for the production and diseases which affect pigeons. Seminars include demonstration of basic basics of anatomy and physiology of pigeons, proper rearing of pigeons, prevention of diseases in to the holding, specific immunoprophylaxis and diseases</p>		

	of different etiology and their therapy. During the course clinical problems from everyday practice will be solved in team work. The student will have oral presentation of the teaching unit by his/her choice.		
<b>11.</b>	<b>Brief content</b> Basics of anatomy and physiology of pigeons. Rearing of pigeons. Biosecurity measures. Bacterial diseases. Viral diseases. Mycotic diseases. Parasitic diseases. Avitaminoses. Metabolic disorders. Poisonings		
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.		
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>	
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)	
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>
			<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>
		<b>16.2</b>	<b>Individual tasks</b>
		<b>16.3</b>	<b>Self-directed learning</b>
			<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>		
	<b>Points gained by student's activities:</b>		
		<i>Type of activity</i>	<i>Points</i>
			<i>minimum</i> <i>maximum</i>
		<b>Attendance and activity on seminars</b>	<b>24</b> <b>30</b>
		<b>Written essay</b>	<b>6</b> <b>10</b>
		<b>Tests (two)</b>	<b>15(x2)=30</b> <b>30(x2)=60</b>
	<b>Final exam</b>	<b>Not predicted</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: basics of anatomy and physiology of pigeons, rearing of pigeons, biosecurity measures, bacterial diseases, viral diseases Second test: mycotic diseases, parasitic diseases, avitaminoses, metabolic disorders, poisonings <b>Final exam (optional):</b> oral or written
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
22.1	1. Referent extracts on internet	
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Organic apiculture</b>		
2.	<b>Code</b>	<b>FVM040</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Misho Hristovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	The aim of the course is to give students basics for organic production of bee products. Seminars cover the meaning of apiculture and basic terms of organic production of food, basic principles of organic beekeeping and necessary procedures which should be performed with focus on production of organic certificate bee products. Also, within the course, apitechnic procedures for organic production of bee products will be elaborated in groups.		
11.	<b>Brief content</b>	Significance of apiculture. Term of organic food production. Basic principles of organic apiculture. Period of conversion. Origin of bees. Location of bee hive. Bee habitat. Wax and honeycomb. Nutrition of bees. Breeding practice. Purchase of queen bees, nucleuses and bee families. Bee health management. Extraction and storage of honey. Quality control of organic honey. Labeling.		
12.	<b>Methods of studying</b>			

	Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
		First test	15	30
	Second test	15	30	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>			
	With gaining up to 60 points from attendance on seminars, written essay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.			
<b>20.</b>	<b>Teaching language</b>		<b>English</b>	

21.	<p><b>Method of monitoring the quality of teaching process</b></p>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Significance of apiculture, definition of organic food production, basic principles for organic apiculture, period of conversion, origin of bees, location of bee hive, bee habitat, wax and honeycomb.</p> <p><b>Second test:</b> Nutrition of bees, breeding practice, purchase of queen bees, nucleuses and bee families, bee health management, extraction and storage of honey, quality control of organic honey, labeling.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<p><b>Textbooks</b></p>															
	<p><b>22.1</b></p> <p><b>Mandatory</b></p> <ol style="list-style-type: none"> <li>1. Naturland Standards for Organic Beekeeping, 2008.</li> <li>2. Demeter standards for beekeeping and hive products, 2008.</li> </ol>															
	<p><b>22.2</b></p> <p><b>Additional</b></p>															

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Ecologic control of bee diseases		
2.	Code	FVM041		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Misho Hristovski, PhD		

<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> The aim of the course is to introduce students with ecological means on control of diseases, pests and enemies of bees. During seminars, practically will be processed ecological means on control of diseases, pests and enemies of bees.			
<b>11.</b>	<b>Brief content</b> Significance of apipathology. Most common diseases in adult bees. Most common diseases in bee brood. Ecological control of viral diseases in bees. Ecological control of bacterial diseases in bees. Ecological control of mycotic diseases in bees. Ecological control of parasitic diseases in bees. Ecological control of noninfectious diseases in bees. Ecological control of pests in bees. Ecological control of enemies in bees.			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week(30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
		First test	15	30
	Second test	15	30	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>

19.	<b>Requirement for signature and taking the final exam</b>	With gaining up to 60 points from attendance on seminars, written assay and two tests, student gets right to take grade mark without reaching the complete final exam. Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.														
20.	<b>Teaching language</b>	<b>English</b>														
21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> significance of apipathology, most common diseases in adult bees, most common diseases in bee brood, ecological control of viral and bacterial diseases in bees</p> <p><b>Second test:</b> ecological control of mycotic, parasitic and noninfectious diseases in bees. ecological control of pests and enemies in bees.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th><i>Grade mark</i></th> <th><i>Points</i></th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>	<i>Grade mark</i>	<i>Points</i>	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
<i>Grade mark</i>	<i>Points</i>															
5	до 59															
6	60-68															
7	69-76															
8	77-84															
9	85-92															
10	93-100															
22.	<b>Textbooks</b>															
	<b>Mandatory</b>															
22.1		Morse A. R. and Flottum K.: Honey bee pests, predators & diseases. 3rd ed. A.I. Root Company, Medina, Ohio, USA, 1997.														
	<b>Additional</b>															
22.2																

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Management of wildlife diseases
2.	Code	FVM042
3.	Study program	Veterinary medicine

4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Misho Hristovski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b> The aim of the course is to give to students basics for the manners of management and control of the diseases in wildlife. Seminars cover general features of diseases in wildlife, research of target population and ecological factors, creation of database and management manners with diseases in wildlife. Also, during this course, different programs for management of diseases in wildlife will be work out in groups.			
11.	<b>Brief content</b> General features of wildlife diseases. Problems during work with animals in free nature. Identification and defining of disease. Collecting data for population. Define of ecological factors. Collecting and shipment material. Researching occurrence for new, chronic and inapparent diseases. Database. Basics principles of management of diseases in wildlife. Management of cause or its vector. Management by manipulation with population of host. Management with medical treatment and immunization. Management by modification of environment. Management by anthropogenic activities. Programs for urgent and integrated management of diseases. Assessment of efficiency of program for management of diseases.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	<b>30 hours</b>
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	<b>20 hours</b>
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	
17.	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	24	30
		Written essay	6	10
	First test	15	30	
	Second test	15	30	
	<b>Total:</b>	<b>60</b>	<b>100</b>	

18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)														
			from 51 to 60 points	6 (six) (E)														
			from 61 to 70 points	7 (seven) (D)														
			from 71 to 80 points	8 (eight) (C)														
			from 81 to 90 points	9 (nine) (B)														
			from 91 to 100 points	10 (ten) (A)														
19.	Requirement for signature and taking the final exam		<p>With gaining up to 60 points from attendance on seminars, written assay and two tests, student gets right to take grade mark without reaching the complete final exam.</p> <p>Complete final exam is required for the student who did not pass one of the two tests during the semester, or if he/she did not gained minimal 60 points.</p>															
20.	Teaching language		English															
21.	Method of monitoring the quality of teaching process		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> general features of wildlife diseases, problems during work with animals in free nature, identification and defining of disease, collecting data for population, define of ecological factors, collecting and shipment material, researching occurrence for new, chronic and inapparent diseases, database.</p> <p><b>Second test:</b> basic principles of management of diseases in wildlife, management of cause or its vector, management by manipulation with population of host, management with medical treatment and immunization, management by modification of environment, management by anthropogenic activities, programs for urgent and integrated management of diseases, assessment of efficiency of program for management of diseases.</p> <p><b>Complete final exam (optional):</b> Oral or written and it contents practical test and final exam. Practical test is graded descriptively (passed/not passed), and the final exam with grade mark from 5 to 10. Point equivalents to the final exam's grade marks are:</p> <table border="1"> <thead> <tr> <th>Grade mark</th> <th>Points</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>до 59</td> </tr> <tr> <td>6</td> <td>60-68</td> </tr> <tr> <td>7</td> <td>69-76</td> </tr> <tr> <td>8</td> <td>77-84</td> </tr> <tr> <td>9</td> <td>85-92</td> </tr> <tr> <td>10</td> <td>93-100</td> </tr> </tbody> </table>		Grade mark	Points	5	до 59	6	60-68	7	69-76	8	77-84	9	85-92	10	93-100
Grade mark	Points																	
5	до 59																	
6	60-68																	
7	69-76																	
8	77-84																	
9	85-92																	
10	93-100																	
22.	Textbooks																	
	22.1	Mandatory																

		<ol style="list-style-type: none"> <li>1. Wobeser A.G.: <b>Diseases in Wild Animals: Investigation and Management</b>. Springer, 2007.</li> <li>2. Delahay R.J., Smith G.C., Hutchings M.R.: <b>Management of Disease in Wild Mammals</b>. Springer, 2009.</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Parasitology in public health		
2.	Code	FVM043		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Jovana Stefanovska, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> Through this course students will learn about the clinical approach and laboratory diagnosis of parasitic diseases which are significant zoonosis and are of great importance in public health.			
11.	<b>Brief content</b> Introduction: Definition of zoonosis. The role of the parasitic zoonoses in world health. Epidemiology and prevalence of the parasitic zoonoses. Protozoa: giardiasis, balantidiosis, eutamoebosis, toxoplasmosis, cryptosporidiosis and pneumocystosis, random protozoan infestations in humans. Trematoda: fasciolosis and dicrocoeliosis. Cestoda: teniasis and cysticercosis, hydatidosis and cenurosis, diphylbotriosis, hymenolepodosis and random cestodal infestations in humans. Nematoda: trichinelosis, visceral and cutaneous larva migrans syndrome, strongyloidosis, anisakidosis and random nematodal infestations in humans. Arthropoda: infestations with ticks in habitats and grazing fields, lice and trombiculid mites; random infestations of humans with other ectoparasites from animals and allergic reactions in humans; miasis			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Practicals: performing diagnostic methods in laboratory Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.		15.1	Lectures - theory classes	

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	12	15
		Attendance on practicals	12	15
		Written essay	6	10
	Tests (two)	(2x15) 30	(2x30) 60	
	Final exam	Not predicted		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam are actually the two tests.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		G.D. Schmidt, L.S. Roberts: FOUNDATION OF PARASITOLOGY, Times Mirror/Mosby, 3th edition, St. Louis - Toronto - Santa Clara 1985.		
<b>22.2</b>	<b>Additional</b>			

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Harmful antinutritive substances in feed		
2.	Code	FVM044		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Risto Prodanov, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b>  The goal of this course is students to acquire and deepen the theoretical and practical knowledge of antinutritive harmful substances present in the feed - substances naturally present in the feed (natural metabolites), or substances that has reached in the feed trough contamination.  The seminars include a display of certain groups of foods witch besides nutrients are carriers of various harmful substances, as well as factors that have impact on the amount of their prudential share.  Through the program students will learn about different types of foods that are carriers of harmful substances - antinutritive ingredients that can cause health and immunosuppressive problems in animals, and through their products, in for of residues can be a threat to the human health.  During the seminars it will be learned which antinutritive substances are found in which feed. Ways of prevention, demonstrated as examples in the everyday veterinary practice. Also the student will have an oral presentation of a teaching unit of his/her own choice.</p>			
11.	<p><b>Brief content</b>  Definition and types of harmful substances. Factors that influence the occurrence of harmful substances. Factors that contribute to the negative effect of harmful substances. Harmful substances related to certain types of animal feed. Harmful substances that occur in tooth feed. Harmful substances in feed introduced trough contamination. Harmful substances of biological nature. Molds and mycotoxins in feed. Bacteria and their metabolites in feed. Heavy metals, radionuclides and toxic elements in feed. Prevention and reduction of the harmful effects of the antinutritive substances.</p>			
12.	<p><b>Methods of studying</b>  Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice.  Written essay: learning with use of referent textbooks and internet, preparing wttten assay.</p>			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 2 hours/per week (30 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	

		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>
<b>17.</b>	<b>Method of assessment</b>			
	<b>Points gained by student's activities:</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		<b>Attendance on seminars</b>	<b>24</b>	<b>30</b>
		<b>Written essay</b>	<b>6</b>	<b>10</b>
	<b>Tests (two)</b>	<b>(2x15) 30</b>	<b>(2x30) 60</b>	
	<b>Final exam</b>	<b>Not predicted</b>		
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>	
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> types of antinutritive substances and feed in which they are present</p> <p><b>Second test:</b> factors affecting harmful substances, and prevention of this factors</p> <p><b>Final exam (optional):</b> oral or written (includes one test)</p>		
<b>22.</b>	<b>Textbooks</b>			
		<b>Mandatory</b>		
	<b>22.1</b>	<ol style="list-style-type: none"> <li>1. Forenbacher S.: Otrovnne biljke i biljna otrovanja zivotinja, Zagreb-1998;</li> <li>2. Sinovec Z., Resanovic R., Sinovec Snezana: Mikotoksini-Pojava, efekti i prevencija, Beograd-2006.,</li> <li>3. Проданов Р.: Исхрана на домашните животни-општ дел (скрипта-материјал за интерна употреба);</li> <li>4. Каливода М.: Крмива, Загреб -1990;</li> <li>5. Радовановиќ Т. и сор.: Исхрана домаќих животиња, Чачак -1997;</li> <li>6. Јовановиќ Р.: Исхрана домаќих животиња, Нови Сад - 2001;</li> <li>7. Џукиќ Д.: Биљке за производњу сточне хране, Нови Сад - 2002.</li> </ol>		
<b>22.2</b>	<b>Additional</b>			

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>
<b>1.</b>	<b>Program course title</b>	<b>Additives in feed – health modulators</b>
<b>2.</b>	<b>Code</b>	<b>FVM045</b>
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>

4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Second year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Risto Prodanov, PhD</b>		
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b>  The course Additives in feed – health modulators has aim to introduce the students and the future experts in veterinary medicine with the additives and their use in feed, in order to raise and improve the production in the domestic animals.  Every day there is a new product on the market commercially available with different contents and use. This elective course will significantly help future veterinarians in practice, as well as the future veterinary nutritionists, in managing trough the endless offer of various essential an non-essential additives, dietary supplements, supplements for feed and food.  The ultimate goal of the course Additives in feed – health modulators, is to influence the increase of the quality and quantity of safe food intended for human consumption (meat, milk, eggs).</p>			
11.	<p><b>Brief content</b>  Introduction. Chemical composition of feed (essences of different substances). Definition and type of additives. Importance and classification of additives in feed. Vitamins and their important in feed. Synthetic amino acids. Microelements (chelatinised). Probiotics. Prebiotics. Symbiotic. Enzymes. Antioxidants. Emulators. Pigments – dyes. Aromatic substances. Organic acids. Tannins. Antibiotics (their use in the past and now).</p>			
12.	<p><b>Methods of studying</b>  Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course’s topic by the student’s choice.  Written essay: learning with use of referent textbooks and internet, preparing written essay.</p>			
13.	<b>Total available time</b>	<b>50 hours</b>		
14.	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
15.	<b>Forms of teaching activities</b>	15.1	<b>Lectures - theory classes</b>	
		15.2	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>
16.	<b>Other forms of activities</b>	16.1	<b>Project tasks</b>	
		16.2	<b>Individual tasks</b>	
		16.3	<b>Self-directed learning</b>	<b>20 hours</b>
17.	<b>Method of assessment</b>			

	Points gained by student's activities:		
		<b>Type of activity</b>	<b>Points</b>
			<i>minimum</i> <i>maximum</i>
		Attendance on seminars	24                  30
		Written essay	6                    10
		Tests (two)	(2x15) 30          (2x30) 60
		Final exam	Not predicted
		<b>Total:</b>	<b>60                  100</b>
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam	Final exam is not predicted, except if student did not pass one of the tests.	
20.	Teaching language	English	
21.	Method of monitoring the quality of teaching process	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>First test:</b> importance and application of different additives <b>Second test:</b> types and mechanism of action of additives <b>Final exam (optional):</b> oral or written (includes one test)	
22.	Textbooks		
	22.1	Mandatory	
		<ol style="list-style-type: none"> <li>Pond, W. G., Church D. C., Pond K. R. (1995): Basic Animal Nutrition and Feeding (Fourth Edition). John Wiley and Sons Inc.;</li> <li>Adams, C. A. (1999): Nutricines. Food components in health and nutrition. Nottingham University Press, Nottingham;</li> <li>Adams, C. A. (2002): Total Nutrition. Feeding animals for health and growth. Nottingham University Press, Nottingham.</li> </ol>	
22.2	Additional		

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Residues and contaminants in food
2.	Code	FVM046
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Zehra Hajrulai-Musliu, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The aim of the course is to acquaint students with profound knowledge about the monitoring of residues and contaminants in food for people. They will meet with European and domestic legal framework related to the presence of these substances in food and control their use and penal provisions in case of exceeding the statutory provisions. In the practical part students will participation and take active participation in laboratory analysis proving the specific residues and contaminants in food.			
11.	<b>Brief content</b> Legal framework for the control of residues and contaminants in food of animal origin. Division of residues and contaminants according to European legislation. Stilbens. Thyreostatics. Steroids. Lactones of rezorcil acid. Beta agonists. Other substances - Group A6. Antimicrobial substances. Veterinary drugs (anthelmintics, coccidiostats, carbamates and piretroides, sedatives, NSAID, other pharmacologically active substances). Organochlorine pesticides and PCB. Organophosphorus pesticides. Toxic elements. Mycotoxins. Pigments. MRL, ADI. Specific control measures. Monitoring and control plans for residues. Methods for detection and quantification. Laboratory network, interlaboratory testing, accreditation.			
12.	<b>Methods of studying</b> Seminars: work in large group with discussion and active participation of the students Practicals: Laboratory practicals for determination of some residues and contaminants in food. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	20 hours
		16.2	Individual tasks	
		16.3	Self-directed learning	
17.	Method of assessment			
	Points gained by student's activities:			
		Type of activity	Points	
			minimum	maximum
		Attendance on seminars	12	15
		Attendance on practicals	12	15
		Written essay	6	10
	Tests (two)	(2x15) 30	(2x30) 60	
	Final exam	Not predicted		
	Total:	60	100	
18.	Grading criteria (points/grade)	up to 50 points	5 (five) (F)	
		from 51 to 60 points	6 (six) (E)	

		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.	
<b>20.</b>	<b>Teaching language</b>	<b>English</b>	
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam (optional):</b> oral or written (includes one test)	
<b>22.</b>	<b>Textbooks</b>		
	<b>Mandatory</b>		
<b>22.1</b>	1. <a href="http://ec.europa.eu/food/index_en.htm">http://ec.europa.eu/food/index_en.htm</a> 2. <a href="http://www.efsa.europa.eu/">http://www.efsa.europa.eu/</a>		
	<b>Additional</b>		
<b>22.2</b>			

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Toxicology of poisonous plants</b>		
<b>2.</b>	<b>Code</b>	<b>FVM047</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Romel Velev, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b>			
	The aim of this course is to acquaint the student with systematic and morphological characteristics of plants whose effects in the animal organism is harmful or toxic, their prevalence in nature, active components that contain and which lead to intoxication, effects and symptoms that they manifest among individual animals, with pathomorphological changes and practical significance of poisoning with these plants.			
	With the course will be processed poisoning in domestic animals caused by certain algae, fungi, ferns, and gymnosperms and angiosperms which the student is given the opportunity to visualize the different			

	types of poisonous plants. Different types of poisonous plants and plant toxins will be exhibited in the form of examples of routine veterinary practice.			
<b>11.</b>	<b>Brief content</b> <i>General part:</i> Factors affecting the toxicity of the plant. Signs of intoxication with poisonous plants. Diagnosis of intoxication with poisonous plants. Practical significance of plant poisoning. Prevention of intoxication with poisonous plants. Treatment of animals intoxicated with poisonous plants. <i>Special part:</i> Poisoning of animals caused by certain species of algae. Poisoning of animals caused by certain species of fungi. Poisoning of animals caused by certain species of ferns. Poisoning of animals caused by certain species of gymnosperms. Poisoning of animals caused by certain species of angiosperms (monocots and dicots).			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity on seminars	24	30
		Written essay	6	10
		Tests (two)	(2x15) 30	(2x30) 60
	Final exam	Not predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written First test: general part Second test: special part <b>Final exam:</b> not predicted <b>Complete final exam:</b> not predicted
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
22.1	1. Ramesh C. Gupta: Veterinary Toxicology Basic and Clinical Principles, Elsevier Third Edition 2018. 2. Extracts from referent textbooks and Internet	
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Oncology</b>		
2.	<b>Code</b>	<b>FVM048</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Trpe Ristoski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	<p>Having regard of rapidly increasing importance of the tumors in routine veterinary practice, as well as many complications caused by their appearing, it is necessary to introduce the students with pathogenesis, diagnostics and treatment of the tumours.</p> <p>Besides theory classes, during the teaching the student would have opportunity to be related with the tumor pathology from the practical aspect. With application of the most recent classification of tumors, this course includes tumors of all organic systems, with special attention on skin tumors and tumors of mammary gland in bitches.</p> <p>Also, tumors in domestic animal are very important part of the veterinary pathology from the aspect of the comparative oncology because their big similarity with human tumors.</p>		
11.	<b>Brief content</b>	<p>Tumour nomenclature. Features of the benign and malignant tumours. Cancerogenesis: molecular basis of tumours. Tumour ethiology. Classification of tumors: mesenchyme tissue tumours, epithelial tissue tumours. Clinical features of the tumours. Laboratory diagnostics of the tumours. Treatment of the</p>		

	tumours.																									
<b>12.</b>	<b>Methods of studying</b> Seminars: work in group with discussion and active participation of the students. Practicals: practicals (clinical cases, morphological features of the tumors; laboratory diagnostics of tumors; diagnosis and treatment of tumors). Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.																									
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>																								
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)																								
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>																							
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																							
			<b>30 hours</b>																							
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																							
		<b>16.2</b>	<b>Individual tasks</b>																							
		<b>16.3</b>	<b>Self-directed learning</b>																							
			<b>20 hours</b>																							
<b>17.</b>	<b>Method of assessment</b>																									
	Points gained by student's activities:																									
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on seminars</td> <td>12</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>5</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>10</td> <td>20</td> </tr> <tr> <td>Final exam</td> <td>9</td> <td>25</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on seminars	12	15	Attendance and activity (knowledge) on practicals	24	30	Written essay	5	10	Tests (two)	10	20	Final exam	9	25	<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																									
	<i>minimum</i>	<i>maximum</i>																								
Attendance on seminars	12	15																								
Attendance and activity (knowledge) on practicals	24	30																								
Written essay	5	10																								
Tests (two)	10	20																								
Final exam	9	25																								
<b>Total:</b>	<b>60</b>	<b>100</b>																								
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																							
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																							
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																							
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																							
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																							
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																							
<b>19.</b>	<b>Requirement for signature and taking the final exam</b> For being able to reach the final exam student has to gain up to 45 points from seminars and practicals, and the two tests. If student does not show result on the one of the tests, but has gained points only on seminars and practicals, he/she has to go on complete final exam.																									
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																								

21.	<b>Method of monitoring the quality of teaching process</b>	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written</p> <p><b>First test:</b> Tumour nomenclature, Features of the benign and malign tumours, Cancerogenesis: molecular basis of tumours, Tumour etiology</p> <p><b>Second test:</b> Classification of tumours, Clinical features of the tumours, Laboratory diagnostics of the tumours, Treatment of the tumours</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral + practical</p>
22.	<b>Textbooks</b>	
	22.1	<p><b>Mandatory</b></p> <p>3. Kumar, Cotran, Robbins: Basic Pathology. 7 edition, 2003.</p> <p>4. Jubb K., Kenedy P., Plamer N.: Pathology of domestic animals. 4-1992.</p>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Techniques of anaesthesia and analgesia in different companion animals</b>		
2.	<b>Code</b>	<b>FVM049</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fourth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>1.0</b>
8.	<b>Teacher</b>	<b>Prof. Plamen Trojachanec, PhD Ass. Prof. Ksenija Ilievska, PhD</b>		
9.	<b>Preconditions</b>			
10.	<p><b>Program course goals (competencies):</b></p> <p>The aim of the course is to enable the students to expand and apply their previously acquired knowledge of anatomy, pathology, pharmacology, general surgery and anesthesiology.</p> <p>Students will have the opportunity to perform individual examination, anesthetic application and running anesthetic protocols for pets and exotic animals and practical work in selected clinical problems.</p>			
11.	<p><b>Brief content</b></p> <p>Specific anesthetic techniques and immobilization in companion animals. Specific anesthetic</p>			

	techniques and immobilization in exotic pets.			
<b>12.</b>	<b>Methods of studying</b> Independently performing of surgical procedures under the qualified supervision and preparing the written essay by using referent textbooks and internet in order to encourage the student for independent work and research.			
<b>13.</b>	<b>Total available time</b>	<b>25 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Practical work: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>15 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>10 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity on practical work	8	15
		Written essay	52	85
	Final exam	Not predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	up to 50 points		<b>5 (five) (F)</b>
		from 51 to 60 points		<b>6 (six) (E)</b>
		from 61 to 70 points		<b>7 (seven) (D)</b>
		from 71 to 80 points		<b>8 (eight) (C)</b>
		from 81 to 90 points		<b>9 (nine) (B)</b>
		from 91 to 100 points		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		1. Thurmon J.C., Tranquilli W.J., Benson G.J.Lumb & Jones <i>Veterinary Anesthesia</i> 3rd edition. 1996, Williams &Wilkins		
<b>22.2</b>	<b>Additional</b>			


Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Veterinary inspection		
2.	Code	FVM050		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fourth year/ winter or summer semester	ECTS credit points	1.0
8.	Teacher	<b>Prof. Risto Prodanov, PhD</b> <b>Prof. Pavle Sekulovski, PhD</b> <b>Prof. Dean Jankuloski, PhD</b> <b>Ass. Prof. Sandra Mojsova, PhD</b> <b>Ass. Prof. Mirko Prodanov, PhD</b>		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> Through this course students are introduced to modern principles, structure and functioning of the veterinary-sanitary control and inspection according the Macedonian national legislation and EU legislation from the field of veterinary public health and food safety. The goal is to elaborate some chapters of the Law on Veterinary Health, Food Safety Law, Law on the consumer protection and accompanying bylaws related to competencies of veterinary inspection and to introduce students in their practical application.			
11.	<b>Brief content</b> <b>Seminars</b> Organization of veterinary inspection (state bodies responsible for veterinary inspection), structure and organization of the Food and Veterinary Agency. Organization and legal responsibilities in veterinary-sanitary supervision, control and audit of veterinary inspection in the EU (DG SANCO, Food and Veterinary Office FVO). Implementation of veterinary inspection in the production and marketing of products of animal origin and regulations pertaining to food safety under the the Law on Veterinary Health and Food Safety Law. Analysis, management and communication of risks in veterinary inspection. Practical application of the powers, duties and responsibilities of the authorized and official veterinarian performing the inspection work: contents of the inspection, sampling for specific laboratory tests, preparation of documentation paperwork (inquiries, accompanying letters, findings and solutions). Certification and regulations for identification and declaration of animal food products (labels, quality and origin). Work of the state veterinary border inspection, review of documents, identification and physical examination of consignments of animals and products of animal origin. Law on Consumer Protection, role of the Food and Veterinary Agency. <b>Practicals</b> Practical introduction to the work of veterinary inspection in the primary production and placing on the market of the products of animal origin (slaughterhouse practices, dairy processing facilities, the warehouses and the retail).			
12.	Methods of studying			

	Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice. Practicals: field practice Written essay: learning with use of referent textbooks and internet, preparing written essay.																									
<b>13.</b>	<b>Total available time</b>	<b>25 hours</b>																								
<b>14.</b>	<b>Organization of the course</b>	Seminars and practicals: 1 hour/per week(15 hours)																								
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>																							
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																							
			<b>15 hours</b>																							
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																							
		<b>16.2</b>	<b>Individual tasks</b>																							
		<b>16.3</b>	<b>Self-directed learning</b>																							
			<b>10 hours</b>																							
<b>17.</b>	<b>Method of assessment</b>	Points gained by student's activities:																								
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on seminars</td> <td>12</td> <td>15</td> </tr> <tr> <td>Attendance and activity (knowledge) on practicals</td> <td>12</td> <td>15</td> </tr> <tr> <td>Written essay</td> <td>6</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>15(x2)=30</td> <td>30(x2)=60</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Not predicted</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on seminars	12	15	Attendance and activity (knowledge) on practicals	12	15	Written essay	6	10	Tests (two)	15(x2)=30	30(x2)=60	Final exam	Not predicted		<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																									
	<i>minimum</i>	<i>maximum</i>																								
Attendance on seminars	12	15																								
Attendance and activity (knowledge) on practicals	12	15																								
Written essay	6	10																								
Tests (two)	15(x2)=30	30(x2)=60																								
Final exam	Not predicted																									
<b>Total:</b>	<b>60</b>	<b>100</b>																								
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>																							
		<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>																							
		<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>																							
		<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>																							
		<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>																							
		<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>																							
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted, except if student did not pass one of the tests.																								
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																								
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam (optional):</b> oral or written (includes one test)																								
<b>22.</b>	<b>Textbooks</b>																									
	<b>22.1</b>	<b>Mandatory</b>																								

		<ol style="list-style-type: none"> <li>1. Buncic, S. (2006) Integrated Food Safety and Veterinary Public Health</li> <li>2. Wilson W. G. (1997) Wilson's practical meat inspection</li> <li>3. Bremner, A., Johnston, M. (1996) Poultry Meat Hygiene and Inspection</li> <li>4. <a href="http://vetlex.taieex.be/">http://vetlex.taieex.be/</a></li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Changes in laboratory profile in diseases of companion animals		
2.	Code	FVM051		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Ass. Prof. Elena Atanaskova Petrov, PhD		
9.	Preconditions			
10.	<p><b>Program course goals (competencies):</b></p> <p><b>Definition of the course:</b> At a time when many expensive specific tests, such as at a time when many expensive specific tests, such as ultrasonic diagnostics, Doppler ultrasound, computer tomography, magnetic resonance are present in clinics, with varying degrees of development, clinical diagnosis remains the best surveillance tool for diseases in animals. It reveals the hidden pathological changes that often cannot be discovered with basic imaging methods (endoscopy, x-ray, ultrasound and physical examinations).</p> <p><b>Position of the course in veterinary education:</b> this course is going to give the basics to the future clinicians to integrate clinical signs and laboratory findings, in order to gain comprehensive diagnosis. it also provides systematical approach for integrating laboratory changes during the detection of the possible diagnosis.</p> <p>One of the most important elements, that future practitioners will meet are the differences between <b>static</b> and <b>dynamic</b> testing.</p> <ul style="list-style-type: none"> <li>➤ <b>Static laboratory testing</b> - a standard approach to the diagnosis of diseases. Laboratory values of the patient are compared with a set of normal values gained from healthy population. Such an approach is available in all the books that describe tests for different disorders of the organs. However, this kind of test has limiting factors such as age, breed or environmental factors.</li> <li>➤ <b>Dynamic laboratory testing</b> - this is a method of evaluation based on the changes that appear during the disease in certain laboratory profiles of individual patients. It is a good method for diagnostic of diseases, observation of the early response of therapy and detecting changes based on the age of patient. with this approach, laboratory tests are repeated in order to reveal the changes in the values. If animals have established normal values, the small changes in the values are extremely important.</li> </ul>			

	<b>Relations of the course with the curriculum:</b> although elective course, certain knowledge from the compulsory courses is needed (Pathophysiology, Clinical and laboratory diagnostics in companion animals and equines, Diagnostic imaging methods and Internal diseases of companion animals and equines).		
<b>11.</b>	<p><b>Brief content</b>  <b>Seminars</b>  <i>Serum findings:</i> alkaline phosphates, amino acid ratio, ammonia, amylase, anion gap, aspartate transferase, bicarbonate, bile acids, bilirubin, blood urea nitrogen BUN, BUN:creatinine ratio, Ca, ionized Ca, adjustment of calcium :albumin, chlorides, chloride: phosphate ratio, cholesterol, creatinine phosphocinase/creatinine kinase, creatinine, gamma glutamil transpeptidase, globulin, glucagon toleration test, glucose, glucose toleration test, lipase, Mg, osmolarity, P, K, renal failure rate, Na, Na:Ca rate, triglycerides. <i>Digestive findings:</i> tripsine in feces, proteolysis activity in feces, fat absorption test, feces cytology. <i>Urine findings:</i> bilirubin, cylindrical proteins, catheterization, crystal analyses with frozen urine, coloring, cortisol:creatinine ratio, crystals, cystocentesis, cytology examination, fractional excretion of potassium, fractional excretion of magnesium, fractional excretion of sodium, fractional excretion of phosphates, kenotic bodies, pH, proteins (albumins), protein:creatinine ratio, non-albumin proteinuria, red blood cells, sediment, specific weight, Tamm-Horsfall proteins, urine analyses, urobilinogen, white blood cells. <i>Special serology tests:</i> acetylcholine receptor antibodies, antinuclear antibody test, catecholamine, flow cytometry, lupus erzthematosis test, rheum factor, tumor necrosis factor <i>Diagnosis based on laboratory findings:</i> hypo/hypercalcaemia, hyperholesterosis, decrease in bicarbonates, hypo/hyperglycemia, sodium deficiency, hypo/hyperphosphatemia, hypo/hyperproteinemia, ammonia and bile acid increasing, BUN and creatinine increasing, increasing of lipase/amylase and trypsin like immunoreactivity, increasing of liver enzymes, hypo hyper potassium.</p> <p><b>Practicals</b>  <i>Diagnosis based on clinical signs:</i> weakness, vomiting, seizures, polyuria/polydipsia, icterus, high body temperature, edema, abdominal effusions, diarrhea, abnormal bleeding, hematuria, lipemia, spleen enlargement, lymphadenopathy, decrease of bone density. <i>Dynamic tests at diseases of kidneys, liver, general condition and hormones:</i> Laboratory profiles of different diseases in dogs and cats - individual seminary work..</p>		
<b>12.</b>	<p><b>Methods of studying</b>  Seminars: discussion on topics from the course or written in the referent textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a course's topic by the student's choice.  Practicals: laboratory practice  Written essay: learning with use of referent textbooks and internet, preparing wttten assay.</p>		
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>	
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)	
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>
			<b>30 hours</b>
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>
		<b>16.2</b>	<b>Individual tasks</b>

		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
		<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>	
		<b>Attendance and activity on seminars</b>		<b>22</b>	<b>35</b>
		<b>Attendance and activity on practicals</b>		<b>10</b>	<b>15</b>
	<b>Final exam</b>		<b>Predicted</b>		
	<b>Total:</b>		<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		Final exam is predicted. Criterion for passing the final exam is gaining of 50% of points predicted with seminars and practicals.		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> student mandatory reaches final exam orally or written		
<b>22.</b>	<b>Textbooks</b>				
	<b>22.1</b>	<b>Mandatory</b>			
		Laboratory profiles of small animal diseases, A guide to laboratory diagnosis-third edition Charles H. Sodikoff, Mosby publ. 2001			
<b>22.2</b>	<b>Additional</b>				

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>
<b>1.</b>	<b>Program course title</b>	<b>Ultrasonic diagnosis of reproductive disorders in cows</b>
<b>2.</b>	<b>Code</b>	<b>FVM052</b>
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>

6.	Study year / semester	Fifth year/ winter or summer semester	ECTS credit points	2.0	
8.	Teacher	Prof. Toni Dovenski, PhD Ass. Prof. Branko Atanasov, PhD			
9.	Preconditions				
10.	<b>Program course goals (competencies):</b> The aim of the course is to give students possibilities for practical application of ultrasonic diagnosis of the causes and forms of reproductive pathology in cows. The subject aim is to enable students to expand previously acquired knowledge in the field of reproduction. Students will have the opportunity independently to perform diagnosis and treatment of the common reproductive disorders in cows.				
11.	<b>Brief content</b> Basic principles of ultrasound diagnosis of reproductive disorders in cows. Diagnosis of disorders of ovarian function. Diagnosis of pathology of the uterus. Treatment methods for reproductive disorders.				
12.	<b>Methods of studying</b> Independently performing treatments under expert supervision and preparation of paper work using professional textbooks and internet, in order to encouraging the student for independent work and research.				
13.	Total available time	50 hours			
14.	Organization of the course	Practical work: 2 hours/per week (30 hours)			
15.	Forms of teaching activities	15.1	Lectures - theory classes	30 hours	
		15.2	Practicals (laboratory, auditorial), seminars, team work		
16.	Other forms of activities	16.1	Project tasks	20 hours	
		16.2	Individual tasks		
		16.3	Self-directed learning		
17.	<b>Method of assessment</b>				
	Points gained by student's activities:				
		<i>Type of activity</i>		<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>	
		Attendance and activity (knowledge) on practicals		8	15
		Written essay		52	85
	Final exam		Not predicted		
	Total:		60	100	
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)	
		from 51 to 60 points		6 (six) (E)	
		from 61 to 70 points		7 (seven) (D)	
		from 71 to 80 points		8 (eight) (C)	
		from 81 to 90 points		9 (nine) (B)	
		from 91 to 100 points		10 (ten) (A)	
19.	Requirement for signature and taking the final exam	Final exam is not predicted.			
20.	Teaching language	English			

21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	22.1	<ol style="list-style-type: none"> <li>1. Arthur's veterinary reproduction and obstetrics. By David E. Noakes, Geoffrey H. Arthur, Timothy J. Parkinson, Gary C. W. England Contributor David E. Noakes, Geoffrey H. Arthur, Timothy J. Parkinson, Gary C. W. England Edition: 8, illustrated, Published by Elsevier Health Sciences, 2001 ISBN 0702025569, 9780702025563</li> <li>2. T. Dovenski, P. Trojacanec, Lj. Kocoski, V. Petkov, Lj. Mickov, B. Atanasov; Use of ultrasound imaging of the ovaries for early pregnancy diagnosis in dairy cows, Proceedings of the 1st Conference of the Balkan Network for the Animal Reproduction Biotechnology, 2009.</li> </ol>
22.2	<b>Additional</b>	

Attachement No. 3		First, second and third cycle course program		
1.	<b>Program course title</b>	<b>Advanced andrology and cryobiology</b>		
2.	<b>Code</b>	<b>FVM053</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Toni Dovenski, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	<p>The aim of the course is to enable and introduce the students with the modern achievements in andrology and cryobiology, and to present the basic parameters that can be examined from the genetic material by sophisticated laboratory methods.</p> <p>The course includes a presentation and demonstration of the modern methods used for testing the quality of genetic material prepared for application in the recipients, the latest procedures and protocols for its preparation and cryo-conservation, detailed introduction of the media used for this purpose and finally address its national and European legislation that regulates this field of veterinary medicine</p> <p>During the course, the most current methods will be present theoretically, for examine the quality of genetic material, production and cryo-conservation of deep-frozen semen from different farms animals and associated animal and also practical insight into the intended curriculum material through laboratory practicals.</p>		
11.	<b>Brief content</b>	<p><i>Advanced andrology:</i> Biochemical and physical properties of ejaculate. Microscopic and ultramicroscopic structure of spermatozoa. Assessment of basic quantitative parameters of the ejaculate. Examination of the spermatozoa motility. Techniques for measuring the spermatozoa motility. Photo-electric and -electronic methods for examine the qualitative parameters of the ejaculates (CASA systems). Methods for testing the fertilize ability of the spermatozoa (hamster test, hypo-</p>		

	osmotic test, induction acrosomal reaction, induced agglutination of the sperm. Introduction to local and EU legislation governing the quality of genetic material. <i>Cryobiology</i> : Media types for maintaining the ejaculates. Fundamentals of biophysics cryobiology. Methods for cryopreservation of ejaculates (emphasis on the development of this discipline). Cryopreservation of ejaculate from ruminants, boars, stallions, carnivores. A brief review of the methods for cryopreservation of ejaculates from other animals for commercial purposes.			
<b>12.</b>	<b>Methods of studying</b> Independently performing treatments under expert supervision and preparation of paper work using professional textbooks and internet, in order to encouraging the student for independent work and research.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Practical work: 2 hours/per week (30 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	<b>20 hours</b>
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
<b>17.</b>	<b>Method of assessment</b>			
	Points gained by student's activities:			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance and activity (knowledge) on practicals	8	15
	Written essay	52	85	
	Final exam	Not predicted		
	Total:	60	100	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is not predicted.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		

		<ol style="list-style-type: none"> <li>1. Hafez E.S.E. Reproduction in Farm Animals, 6th Edition, Lea &amp; Febiger, Philadelphia, 1993</li> <li>2. Ian R. Gordon Reproductive technologies in farm animals Published by CABI, 2004</li> <li>3. Chenoweth PJ and Lorton SP., Animal andrology: theories and applications, Wallingford, Oxfordshire</li> </ol>
	22.2	<b>Additional</b>

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Dermatopathology		
2.	Code	FVM054		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Third year/ winter semester or Fifth year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Trpe Ristoski, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> Dermal changes are one of most common clinical cases in veterinary clinical practice, what means dermatopathology is significant part of veterinary medicine. Having in mind morphological and physiological features of skin, almost any system disorder has reflection on skin quality. Especially important part of the course is collecting samples for laboratory tests, as well as laboratory techniques and dermal disorders diagnostics. Besides infectious diseases of skin, the students within this course will be introduced in allergic and metabolic disorders, and also in impact of nutrition on quality of skin (fure).			
11.	<b>Brief content</b> Skin structure and function. Diagnostic techniques. Bacterial diseases. Mycotic and parasitic diseases. Viral diseases. Endocrine and metabolic diseases. Allergic and autoimmune diseases. Nutrition and dermal diseases. Inherited diseases. Dermal tumors. Therapy.			
12.	<b>Methods of studying</b> Seminars: work in group with discussion and active participation of the students. Practicals: laboratory practicals (clinical cases, morphological and pathological features of the skin; pathohistological and cytological diagnostics of skin lesions; differential diagnostics and treatment of skin lesions). Written essay: learning with use of referent textbooks and internet, preparing written essay; presentation and discussion about the written essay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		

15.	Forms of teaching activities	15.1	Lectures - theory classes		
		15.2	Practicals (laboratory, auditorial), seminars, team work	30 hours	
16.	Other forms of activities	16.1	Project tasks		
		16.2	Individual tasks		
		16.3	Self-directed learning	20 hours	
17.	Method of assessment				
	Points gained by student's activities:				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			Attendance and activity on seminars	3	5
			Attendance and activity (knowledge) on practicals	3	5
			Written essay	5	10
		Tests (two)	2x7,5	2x20	
		Final exam	25	40	
		Total:	51	100	
18.	Grading criteria (points/grade)	up to 50 points		5 (five) (F)	
		from 51 to 60 points		6 (six) (E)	
		from 61 to 70 points		7 (seven) (D)	
		from 71 to 80 points		8 (eight) (C)	
		from 81 to 90 points		9 (nine) (B)	
		from 91 to 100 points		10 (ten) (A)	
19.	Requirement for signature and taking the final exam	For being able to reach the final exam student has to gain up to 50 points from seminars and practicals and the two tests. If student does not show result on the one of the tests, but has gained points only on seminars and practicals, he/she has to go on complete final exam.			
20.	Teaching language	English			
21.	Method of monitoring the quality of teaching process	<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.  <b>Tests (two):</b> written</p> <p><b>First test:</b> Skin structure and function. Diagnostic techniques. Bacterial diseases. Mycotic and parasitic diseases. Viral diseases.</p> <p><b>Second test:</b> Endocrine and metabolic diseases. Allergic and autoimmune diseases. Nutrition and dermal diseases. Inherited diseases. Dermal tumors. Therapy.</p> <p><b>Final exam:</b> oral</p> <p><b>Complete final exam:</b> oral + practical</p>			
22.	Textbooks				

		<b>Mandatory</b>	
	<b>22.1</b>	<ul style="list-style-type: none"> <li>- Small Animal Dermatology: A Color Atlas and Therapeutic Guide</li> <li>- Muller and Kirk's Small Animal Dermatology</li> <li>- Clinical Dermatology, An Issue of Veterinary Clinics: Small Animal Practice</li> <li>- Jubb K., Kenedy P., Plamer N.: Pathology of domestic animals. 4-1992.</li> </ul>	
	<b>22.2</b>	<b>Additional</b>	

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Veterinary dentistry in dogs and cats</b>		
<b>2.</b>	<b>Code</b>	<b>FVM055</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Ass. Prof. Ksenija Ilievska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competences):</b>	<p>Veterinary dentistry is a relatively new clinical discipline in small practice. Number of dogs and cats with diseases localized in the oral cavity such as poly- and oligo-dentition, caries, tooth fractures, epulids, severe stomatitis and many other pathologies in oral cavity small animal practice increases every day in small animal practice. This development of veterinary practice necessarily imposes the need to introducing such course in order to gain additional knowledge and competence of future veterinarians (doctors of veterinary medicine). Veterinary dentistry requires a basic knowledge of anatomy and normal development of teeth in dogs and cats, X-ray imaging, dental instruments as well as anesthesiology and pathology of the oral cavity and teeth.</p>		
<b>11.</b>	<b>Brief content</b>	<p>A detailed description of anatomy, topography and physiology of the teeth in dogs and cats. Diagnostic methods of diseases in the oral cavity such as various types of stomatitis, gingivitis, epulides, sialocele, tumors in the oral cavity, congenital anomalies of the teeth, teeth diseases such as caries, tooth fractures, dental plaques and prevention and treatment of paradontosis. Planing and treatment of diseases. Also, the most common surgical interventions such as teeth extraction, apical osteotomy, tumor removal, maxillar and mandibullar fractures, maxilectomy and mandibulectomy are included in the course, as well as novels in therapy and surgical treatments.</p> <p>Whitin practical part, students will actively participate in diagnostics, planning and treatment of oral diseases as well as surgical interventions.</p>		
<b>12.</b>	<b>Methods of studying</b>	Seminars: work in small group.		

	Practicals: direct participation in diagnostic procedures, treatments and surgical interventions. Independently performing of surgical procedures under the qualified supervision and preparing the written essay by using referent textbooks and internet in order to encourage the student for independent work and research.			
<b>13.</b>	<b>Total available time</b>	<b>50</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)		
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	
			<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	
		<b>16.2</b>	<b>Individual tasks</b>	
		<b>16.3</b>	<b>Self-directed learning</b>	
			<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>			
		<i>Type of activity</i>	<i>Points</i>	
			<i>minimum</i>	<i>maximum</i>
		Attendance on seminars	<b>10</b>	<b>15</b>
		Attendance on practicals	<b>10</b>	<b>15</b>
		Written essay	<b>12</b>	<b>20</b>
		Final exam	<b>Predicted</b>	
	<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam is predicted. Criterion for passing the final exam is gaining of 50% of points predicted with seminars and practicals, and written essay.		
<b>20.</b>	<b>Teaching language</b>	<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.		
<b>22.</b>	<b>Textbooks</b>			
	<b>22.1</b>	<b>Mandatory</b>		
		1. BSAVA Manual of Canine and Feline Dentistry, 3rd Edition		
<b>22.2</b>	<b>Additional</b>			


Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Green economy and sustainable development		
2.	Code	FVM056		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/ winter or summer semester	ECTS credit points	2.0
8.	Teacher	Prof. Blagica Sekovska, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> Increasing the pollution as a result of economic activities of mankind implies increasing the care about natural environment, but also connection to the ecological and economical activities. Economic development per se, it is not paradigm to the contemporary world, but we talk more and more for development which not degrades the environment, that means we talk about sustainable development. To accomplish such sustainable development it is necessary adaptation and greening of economic principles, with special emphasis of health and safety of environment and people.			
11.	<b>Brief content</b> <i>Seminars</i> What is green economy. What is sustainable development. Green economy development. Green working places. Concept of energy efficiency and sustainable source of energy. Agriculture as a factor of sustainable source of energy. Climate changes and sustainability. Agriculture as a factor of greening of economy. Protection of the environment and sustainable development. Agriecological measures. Innovations and sustainable development. <i>Practicals</i> Practical have aim to support seminars and additional development of some contents from practical point of view with different teaching methods like dramatization of certain assumed situations and case studies, development of diferent technicues of starategical planing etc.			
12.	<b>Methods of studying</b> Seminars: work in large group with discussion and active participation of the students. Practical: practicals with dramatization of situation, case study, presentation of some teaching units by the students, discussion about topics of interest and other ways of work in smaller groups Written assay: learning with use of referent literature and internet, preparing written assay; presentation and discussion about the written assay.			
13.	Total available time	50 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours) Practical: 1 hour/per week (15 hours)		
15.		15.1	Lectures - theory classes	

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			<b>Attendance on seminars</b>	<b>8</b>	<b>12</b>
			<b>Attendance and activity (knowledge) on practicals</b>	<b>12</b>	<b>14</b>
			<b>Written essay</b>	<b>10</b>	<b>14</b>
			<b>Tests (two)</b>	<b>15(x2)=30</b>	<b>30(x2)=60</b>
		<b>Final exam</b>	<i>On student's request for higher grade mark</i>		
		<b>Total:</b>	<b>60</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>		Besides attendance on seminars and practicals additional condition for course teacher's signature at the end of the semester, is passing of tests during the semester with up to 25% points gained test.		
<b>20.</b>	<b>Teaching language</b>		<b>English</b>		
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>		<p>The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading.</p> <p><b>Tests (two):</b> written  First test: general part  Second test: special part</p> <p><b>Final exam:</b> on student's request</p> <p><b>Complete final exam:</b> on student's request</p> <p>Final exam is predicted on request of the student if he/she wants to gain grade mark higher than one which was gained with his/her previous activities. Student who did not pass one of the tests during the semester goes to one of the tests during the exam sessions.</p>		
<b>22.</b>	<b>Textbooks</b>				
	<b>22.1</b>	<b>Mandatory</b>			

		<ol style="list-style-type: none"> <li>1. Pešić Radmilo (2002): Ekonomija prirodnih resursa i životne sredine. Poljoprivredni fakultet. Beograd.</li> <li>2. Perman, R. Ma, Y. and McGilvray J. (1996): Natural Resource and Environmental Economics. Longman. London and New York.</li> <li>3. Pearce, D.W. and Turner, R.K. (1998): Economics of Natural Resources and the Environment. Harvester Wheatsheaf, New York.</li> <li>4. Quentin Grafton R., Adamowicz W., Dupont, D., Nelson H., Hill, R.J., Renzetti, S. (2004): The Economics of the Environment and Natural Resources. Blackwell Publ.</li> </ol>
	<b>22.2</b>	<b>Additional</b>
Current web pages on recommendation by the course teacher.		

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
<b>1.</b>	<b>Program course title</b>	<b>Clinical pathophysiology</b>		
<b>2.</b>	<b>Code</b>	<b>FVM057</b>		
<b>3.</b>	<b>Study program</b>	<b>Veterinary medicine</b>		
<b>4.</b>	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
<b>5.</b>	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
<b>6.</b>	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
<b>8.</b>	<b>Teacher</b>	<b>Prof. Igor Ulchar, PhD Ass. Prof. Irena Celeska, PhD</b>		
<b>9.</b>	<b>Preconditions</b>			
<b>10.</b>	<b>Program course goals (competencies):</b> The aim of the course is to expand knowledge on laboratory methods for detection of pathophysiological disturbances in small and large animals and implementation of their practical use in making diagnosis. In fact, the course includes details used in routine practice and diagnostics.			
<b>11.</b>	<b>Brief content</b> Taking blood samples, appropriate handling in preanalytical stage, performing laboratory tests in analytical stage and their verification and validation, working principles of laboratory equipment, handling with testing reagents, result interpretation in postanalytical stage, as a bioindicators of certain disease. Endocrinopathies in small animals, with hormone disbalance and parameters analyzed in continuous monitoring. Bioindicators in oncological patients and monitoring in haemotherapy. Metabolic status in large animals, prediction and early detection of production diseases, energy, electrolyte and mineral disbalance, changes in homeostase in high-productive cows, in various stages of production-reproductive cycle. Heat stress and inflammation bioindicators in large animals.			
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on clinical cases; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a teaching using by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>		
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)		
<b>15.</b>		<b>15.1</b>	<b>Lectures - theory classes</b>	

	<b>Forms of teaching activities</b>	<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>	<b>30 hours</b>	
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>		
		<b>16.2</b>	<b>Individual tasks</b>		
		<b>16.3</b>	<b>Self-directed learning</b>	<b>20 hours</b>	
<b>17.</b>	<b>Method of assessment</b>				
	<b>Points gained by student's activities:</b>				
			<i>Type of activity</i>	<i>Points</i>	
				<i>minimum</i>	<i>maximum</i>
			<b>Attendance on seminars</b>	<b>4</b>	<b>10</b>
		<b>Written essay</b>	<b>0</b>	<b>10</b>	
		<b>Final exam</b>	<b>0</b>	<b>80</b>	
		<b>Total:</b>	<b>56</b>	<b>100</b>	
<b>18.</b>	<b>Grading criteria (points/grade)</b>		<b>up to 50 points</b>	<b>5 (five) (F)</b>	
			<b>from 51 to 60 points</b>	<b>6 (six) (E)</b>	
			<b>from 61 to 70 points</b>	<b>7 (seven) (D)</b>	
			<b>from 71 to 80 points</b>	<b>8 (eight) (C)</b>	
			<b>from 81 to 90 points</b>	<b>9 (nine) (B)</b>	
			<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>	
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Minimum points from attendance on seminars is requirement for course teacher's signature. The final exam is mandatory, after student's deliverance of the written essay.			
<b>20.</b>	<b>Teaching language</b>	<b>English</b>			
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Final exam:</b> Oral or written			
<b>22.</b>	<b>Textbooks</b>				
	<b>22.1</b>	<b>Mandatory</b>			
		1. Veterinary Laboratory Medicine, Clinical Biochemistry and Hematology, Morag G. Kerr, 2002, Blackwell Science			
<b>22.2</b>	<b>Additional</b>				

Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Veterinary vaccinology		
2.	Code	FVM058		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Second year/ summer semester	ECTS credit points	1.0
8.	Teacher	Prof. Slavcho Mrenoshki, PhD Ass. Prof. Iskra Cvetkovikj, PhD		
9.	Preconditions			
10.	<b>Program course goals (competencies):</b> The purpose of this course is to introduce students of veterinary medicine to the types, production and use of vaccines in veterinary medicine. In addition to the general knowledge about vaccines, students will gain knowledge about vaccine protocols in different types of animals and the importance of veterinary vaccines in public health.			
11.	<b>Brief content</b> The notion of vaccines and a brief history of vaccines and vaccination. Types of vaccines. Production of vaccines. Adjuvant. Vaccination against viral diseases and antigenic viruses diversity. Vaccination against bacterial diseases. Vaccination against parasitic diseases. Vaccine protocol in dogs. Vaccine protocol in cats. Vaccine protocol in birds. Vaccine protocol in cattle. Vaccine protocol in sheep and goats. Vaccine protocol in pigs. Vaccine protocol in equines. Control and eradication of animal diseases by vaccination.			
12.	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the reference textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a teaching unit by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.			
13.	Total available time	25 hours		
14.	Organization of the course	Seminars: 1 hour/per week (15 hours)		
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	15
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	
		16.3	Self-directed learning	10 hours
17.	Method of assessment			

Points gained by student's activities:			Points	
			minimum	maximum
			<i>Type of activity</i>	
			Attendance on seminars	17
			Written essay	4
			Tests (two)	15(x2)=30
			Final exam	/
			<b>Total:</b>	<b>51</b>
18.	Grading criteria (points/grade)		up to 50 points	5 (five) (F)
			from 51 to 60 points	6 (six) (E)
			from 61 to 70 points	7 (seven) (D)
			from 71 to 80 points	8 (eight) (C)
			from 81 to 90 points	9 (nine) (B)
			from 91 to 100 points	10 (ten) (A)
19.	Requirement for signature and taking the final exam		Minimum points from attendance on seminars is requirement for course teacher's signature. Final exam is not predicted, except if student did not pass one of the tests.	
20.	Teaching language		English	
21.	Method of monitoring the quality of teaching process		The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written <b>Final exam (optional):</b> oral or written (includes one test)	
22.	Textbooks			
	22.1	Mandatory	<ol style="list-style-type: none"> <li>1. P.-P. Pastoret, M. Lombard &amp; A.A. Schudel (Eds); Animal vaccination – Part 1: development, production and use of vaccines. OIE Scientific and Technical Review 26 (1), 2007.</li> <li>2. P.-P. Pastoret, M. Lombard &amp; A.A. Schudel (Eds); Animal vaccination – Part 2: scientific, economic, regulatory and socio-ethical aspects. OIE Scientific and Technical Review 26 (2), 2007.</li> <li>3. Milligan, G.N. &amp; A.D.T. Barrett (Eds). Vaccinology – An Essential Guide. Wiley – Blackwell, Chichester, UK, 2015.</li> <li>4. Thomas, S. (Ed); Vaccine Design. Methods and Protocols, Volume 2: Vaccines for Veterinary Diseases. Humana Press, Springer, New York, USA, 2016.</li> </ol>	
		22.2	Additional	

Attachement No. 3		First, second and third cycle course program
1.	Program course title	Veterinary entomology
2.	Code	FVM059
3.	Study program	Veterinary medicine
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies

<b>6.</b>	<b>Study year / semester</b>	<b>Third year/ winter semester</b>	<b>ECTS credit points</b>	<b>2.0</b>																				
<b>8.</b>	<b>Teacher</b>	<b>Prof. Jovana Stefanovska, PhD</b>																						
<b>9.</b>	<b>Preconditions</b>																							
<b>10.</b>	<b>Program course goals (competencies):</b> The purpose of this course is to introduce the students of veterinary medicine to the significance of insects and arthropods as ectoparasites and vectors of infectious and parasitic diseases in animals. With the acquired knowledge, the students will be able to identify the most important taxonomic groups of insects and arthropods of veterinary significance, and will be familiar with the techniques of insect control in order to protect the human and animal population from vector diseases.																							
<b>11.</b>	<b>Brief content</b> Meaning and diversity of insects and arthropods. Insects with veterinary significance. Arthropods with veterinary significance. Direct impact of insects and arthropods on the organism. Insects and arthropods as vectors of diseases. Epidemiology and prevention of vector-borne diseases. Control of the population of insects/arthropods-vectors. Control and treatment of ectoparasitoses.																							
<b>12.</b>	<b>Methods of studying</b> Seminars: discussion on topics from the course or written in the reference textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a teaching unit by the student's choice. Written essay: learning with use of referent textbooks and internet, preparing written essay.																							
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>																						
<b>14.</b>	<b>Organization of the course</b>	Seminars: 2 hours/per week (30 hours)																						
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>	<b>30 hours</b>																				
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																					
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>	<b>20 hours</b>																				
		<b>16.2</b>	<b>Individual tasks</b>																					
		<b>16.3</b>	<b>Self-directed learning</b>																					
<b>17.</b>	<b>Method of assessment</b> Points gained by student's activities: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on seminars</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>6</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>(2x15) 30</td> <td>(2x30) 60</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Not predicted</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>				<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on seminars	24	30	Written essay	6	10	Tests (two)	(2x15) 30	(2x30) 60	Final exam	Not predicted		<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																							
	<i>minimum</i>	<i>maximum</i>																						
Attendance on seminars	24	30																						
Written essay	6	10																						
Tests (two)	(2x15) 30	(2x30) 60																						
Final exam	Not predicted																							
<b>Total:</b>	<b>60</b>	<b>100</b>																						
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>		<b>5 (five) (F)</b>																				
		<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>																				
		<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>																				
		<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>																				
		<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>																				
		<b>from 91 to 100 points</b>		<b>10 (ten) (A)</b>																				

19.	<b>Requirement for signature and taking the final exam</b>	Final exam are actually the two tests.
20.	<b>Teaching language</b>	<b>English</b>
21.	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written
22.	<b>Textbooks</b>	
	<b>Mandatory</b>	
	<b>22.1</b>	1. Williams R.: Veterinary Entomology - Livestock and Companion Animals. CRC-Press, 2010. 2. Wall R., Shearer D.: Veterinary Entomology - Arthropod Ectoparasites of Veterinary Importance. Chapman & Hall, 1997. 3. Wall R., Shearer D.: Veterinary Ectoparasites: Biology, Pathology and Control 2 <sup>nd</sup> ed. Blackwell Science, 2001. 4. Mullen G., Durden L.: Medical and Veterinary Entomology 2 <sup>nd</sup> ed. Academic Press, 2009.
	<b>22.2</b>	<b>Additional</b>

<b>Attachement No. 3</b>		<b>First, second and third cycle course program</b>		
1.	<b>Program course title</b>	<b>Veterinary clinical parasitology</b>		
2.	<b>Code</b>	<b>FVM060</b>		
3.	<b>Study program</b>	<b>Veterinary medicine</b>		
4.	<b>Study program organizer (unit, i.e. institute, department, section)</b>	<b>Faculty of Veterinary Medicine - Skopje</b>		
5.	<b>Degree of education (first, second, third cycle)</b>	<b>First and second cycle integrated studies</b>		
6.	<b>Study year / semester</b>	<b>Fifth year/ winter or summer semester</b>	<b>ECTS credit points</b>	<b>2.0</b>
8.	<b>Teacher</b>	<b>Prof. Jovana Stefanovska, PhD</b>		
9.	<b>Preconditions</b>			
10.	<b>Program course goals (competencies):</b>	The purpose of this course is to extend the knowledge of students in veterinary medicine for the morphological identification of the parasites causing diseases in animals, as well as the application of current immunological and molecular methods in the diagnosis of diseases. With the acquired knowledge, students will be able to independently perform laboratory diagnostics of the most important parasitic diseases in veterinary medicine.		
11.	<b>Brief content</b>	Coprological examination for diagnosis of parasitoses. Detection of protozoa and helminths in the skin, eyes, urinary and genital system. Detection of parasites in the blood. Immunological and molecular diagnostic methods in veterinary parasitology. Diagnosis of arthropod parasites.		
12.	<b>Methods of studying</b>	Seminars: discussion on topics from the course or written in the reference textbooks; active participation of the student (exposing personal opinions, ideas, discussion); oral presentation of a teaching unit by the student's choice.		

	Practicals: work in laboratory Written essay: learning with use of referent textbooks and internet, preparing written essay.																						
<b>13.</b>	<b>Total available time</b>	<b>50 hours</b>																					
<b>14.</b>	<b>Organization of the course</b>	Seminars: 1 hour/per week (15 hours) Practicals: 1 hour/per week (15 hours)																					
<b>15.</b>	<b>Forms of teaching activities</b>	<b>15.1</b>	<b>Lectures - theory classes</b>																				
		<b>15.2</b>	<b>Practicals (laboratory, auditorial), seminars, team work</b>																				
			<b>30 hours</b>																				
<b>16.</b>	<b>Other forms of activities</b>	<b>16.1</b>	<b>Project tasks</b>																				
		<b>16.2</b>	<b>Individual tasks</b>																				
		<b>16.3</b>	<b>Self-directed learning</b>																				
			<b>20 hours</b>																				
<b>17.</b>	<b>Method of assessment</b>																						
	Points gained by student's activities:																						
		<table border="1"> <thead> <tr> <th rowspan="2"><i>Type of activity</i></th> <th colspan="2"><i>Points</i></th> </tr> <tr> <th><i>minimum</i></th> <th><i>maximum</i></th> </tr> </thead> <tbody> <tr> <td>Attendance on seminars</td> <td>24</td> <td>30</td> </tr> <tr> <td>Written essay</td> <td>6</td> <td>10</td> </tr> <tr> <td>Tests (two)</td> <td>(2x15) 30</td> <td>(2x30) 60</td> </tr> <tr> <td>Final exam</td> <td colspan="2">Not predicted</td> </tr> <tr> <td><b>Total:</b></td> <td><b>60</b></td> <td><b>100</b></td> </tr> </tbody> </table>		<i>Type of activity</i>	<i>Points</i>		<i>minimum</i>	<i>maximum</i>	Attendance on seminars	24	30	Written essay	6	10	Tests (two)	(2x15) 30	(2x30) 60	Final exam	Not predicted		<b>Total:</b>	<b>60</b>	<b>100</b>
<i>Type of activity</i>	<i>Points</i>																						
	<i>minimum</i>	<i>maximum</i>																					
Attendance on seminars	24	30																					
Written essay	6	10																					
Tests (two)	(2x15) 30	(2x30) 60																					
Final exam	Not predicted																						
<b>Total:</b>	<b>60</b>	<b>100</b>																					
<b>18.</b>	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>																					
		<b>5 (five) (F)</b>																					
		<b>from 51 to 60 points</b>																					
		<b>6 (six) (E)</b>																					
		<b>from 61 to 70 points</b>																					
		<b>7 (seven) (D)</b>																					
<b>from 71 to 80 points</b>																							
<b>8 (eight) (C)</b>																							
<b>from 81 to 90 points</b>																							
<b>9 (nine) (B)</b>																							
<b>from 91 to 100 points</b>																							
<b>10 (ten) (A)</b>																							
<b>19.</b>	<b>Requirement for signature and taking the final exam</b>	Final exam are actually the two tests.																					
<b>20.</b>	<b>Teaching language</b>	<b>English</b>																					
<b>21.</b>	<b>Method of monitoring the quality of teaching process</b>	The student is obligated for active participation in all predicted activities for gaining points which are part of the final grading. <b>Tests (two):</b> written																					
<b>22.</b>	<b>Textbooks</b>																						
	<b>22.1</b>	<b>Mandatory</b>																					
		1. Zajac A., Conboy G.: Veterinary Clinical Parasitology 8 <sup>th</sup> ed. Wiley-Blackwell, 2012. 2. Bowman, D.D: Georgis' Parasitology for veterinarians 10 <sup>th</sup> ed. Elsevier Saunders. 2014.																					
<b>22.2</b>	<b>Additional</b>																						


Attachement No. 3		First, second and third cycle course program		
1.	Program course title	Preparation and presentation of diploma work		
2.	Code	FVM615		
3.	Study program	Veterinary medicine		
4.	Study program organizer (unit, i.e. institute, department, section)	Faculty of Veterinary Medicine - Skopje		
5.	Degree of education (first, second, third cycle)	First and second cycle integrated studies		
6.	Study year / semester	Sixth year/ winter semester	ECTS credit points	1.8
8.	Teacher	all teachers (as mentors); vice-dean of education (coordinator)		
9.	Preconditions	Passed all compulsory and all elected elective courses. Realized extra mural practice in XI semester		
10.	<b>Program course goals (competencies):</b> As a confirmation of succesfull solving of fundamentals of research work, student in eleventh semester has to apply, prepare and present a diploma work. During working on diploma work, student is introduced with science-research work methodology, searching data, use of catalogues and data bases, and finding articles related with certain topic. Also, he/she is becoming familiar with finding idea about the research area, way of making hypothesis and research objectives. Also, the student absolves methodology of experiment design, factors which have to be on mind during designing and performing the experiment, and the choice of research methods. After gaining the results, he/she is introduced in way of their processing, presenting and interpretation. During writing the diploma work, the student also absolves references citation modes.			
11.	<b>Brief content</b> The diploma work can be performance of certain experiment, or it can be in revial form (theoretical elaboration on some topic, problem etc.).			
12.	<b>Methods of studying</b> Theoretic elaboration (using scientific and professional referent materials, in printed form or from internet), practical realization of the chosen theme, by supervision of a teacher – mentor.			
13.	Total available time	45 hours		
14.	Organization of the course			
15.	Forms of teaching activities	15.1	Lectures - theory classes	
		15.2	Practicals (laboratory, auditorial), seminars, team work	
16.	Other forms of activities	16.1	Project tasks	
		16.2	Individual tasks	45 hours
		16.3	Self-directed learning	

17.	<b>Method of assessment</b>	Student selects the theme with consultation with teacher – mentor, who is also supervisor of diploma work realization. After that, the metnor delivers diploma work title to the vice-dean of education, and proposes three-membered committee for assessment, grading and presentation of diploma work. The written diploma work is assessed and graded by every committee member particulary (in 5 days after deliverance of the manuscript). After the written diploma work is assessed and graded, the vice-dean of education announces public presentation of the work to the committee mentioned above. The public presentation is also graded by the committee with joint grade mark, and the final grade mark for the diploma work is average of the sume of previous three grade marks of the written work and the joint grade mark of its public presentation	
18.	<b>Grading criteria (points/grade)</b>	<b>up to 50 points</b>	<b>5 (five) (F)</b>
<b>from 51 to 60 points</b>		<b>6 (six) (E)</b>	
<b>from 61 to 70 points</b>		<b>7 (seven) (D)</b>	
<b>from 71 to 80 points</b>		<b>8 (eight) (C)</b>	
<b>from 81 to 90 points</b>		<b>9 (nine) (B)</b>	
<b>from 91 to 100 points</b>	<b>10 (ten) (A)</b>		
19.	<b>Requirement for signature and taking the final exam</b>	The student can work on diploma work after acquiring of total of 328.2 credit points, and after realization of extra mural practice.	
20.	<b>Teaching language</b>	<b>English</b>	
21.	<b>Method of monitoring the quality of teaching process</b>	All student’s activities related with diploma work are supervised by teacher – mentor, selected by the student by his/her own choice.	
22.	<b>Textbooks</b>		
22.1	<b>Mandatory</b>	All scientific and professional references in printed or electronic form relevant for the selected topic	
22.2	<b>Additional</b>		



## FACULTY OF VETERINARY MEDICINE-SKOPJE

### DIPLOMA SUPPLEMENT

<b>1. Data on diploma's owner</b>	
1.1 Name	
1.2 Parrent's name	
1.3 Surname	
1.3 Date of birth, birth place and state	
1.5 ID number	
<b>2. Data on acquired qualification</b>	
2.1 Date of issuing	
2.2 Qualification title	<b>Doctor of veterinary medicine (DVM)</b>
2.3 Name of study program, i.e. main study area, field and discipline	Veterinary medicine, study area: Biotechnical sciences; study field: Veterinary medicine
2.4 Name and status of higher education.scientific institution which issues diploma	Ss Cyril and Methodius University in Skopje, Faculty of Veterinary Medicine – Skopje, public higher education institution, study program accredited by Higher Education Accreditation and Elaboration Board (Decision No. _____, from _____), and approved by Minister of Education and Science (Decision on starting to function No. _____ from _____).
2.5 Name and status of higher education.scientific institution (if different) which administrates diploma	Ss Cyril and Methodius University in Skopje Faculty of Veterinary Medicine – Skopje
2.6 Education language	English
<b>3. Data on qualification grade (cycle)</b>	
3.1 Qualification type (academic/professional)	Academic studies
3.2 Qualification grade according Macedonian and Eurpean qualification frame	First and second cycle integrated studies
3.3 Study program duration: years and ECTS credit points	5.5 years, 11 semesters, 330 credit points
3.4 Conditions for enrolling study program npoprama	Four-year high school, state matura or school matura
<b>4. Data on program's contains and acquired results</b>	
4.1 Mode of study (ordinary, extraordinary)	Ordinary studies
4.2 Study program requirements and results	With completion of the academic studies, graduated doctor of veterinary medicine acquires competences and knowledge from following disciplines from the field of veterinary medicine: basic and clinical disciplines, animal production disciplines, veterinary public health disciplines and professional qualifications. Student in firs 4 semesters attends theory classes and practicals from fundamental and basic courses of veterinary medicine. In next 4 semesters student acquires knowledge and skills from the preclinical courses and gradually is introduced into studying clinical courses. In next 2 semesters student attends compulsory clinical courses, and courses related with food quality and safety and veterinary public health. In eleventh semester student acquires practical experience and skills within compulsory clinical practice in University Veterinary Hospital within FVMS, on livestock farms and food industry enterprises, by supervision of Faculty's teacher. Besides compulsory teaching activities realized at the Faculty, during all study years student has to realize compulsory extra mural practice which could be held in veterinary enterprises, livestock farms, public administration and food industry enterprises, by supervision of doctor of veterinary medicine. At the end of study student independently creates diploma work under mentorship of teacher, and its public presentation is prerequisite for completion of study.

	<p>Study program allows acquiring competencies which have to be possessed by every doctor of veterinary medicine:</p> <p><b>Knowledge and understanding for:</b> structure and function of animal health and reproduction; current procedures in molecular diagnostics of diseases; etiology, pathogenesis, clinical signs, diagnostics and treatment of diseases in animals, including infectious diseases and zoonoses; crucial aspects of preventive veterinary medicine which includes selection and rearing of normal and resistant production animals; hygienic conditions of animal housing and rearing animals and monitoring of main indicators of animal welfare; creation of breeding plans, technologies and animal selection; biology and basis of rearing aquatic organisms, wildlife and bees, i.e. procedures for sustaining their health; hygiene and technology of production, processing and deliverance on market food products of animal origin for human consumption; drug legislative and manuals for responsible use of drugs; laws, bylaws and other administrative regulations related with veterinary medicine, animal husbandry, hunting, food safety, and animal welfare and environment protection; compliance of veterinary ethics and norms in veterinary medicine.</p> <p><b>Application of knowledge and understanding in:</b> taking relevant anamnesis; therapy in animals; use of main surgical techniques and other clinical procedures; care on all common domestic animals in case of emergency and giving main first aid; ability for appropriate assessment for use of analytical methods in laboratory diagnostics and result interpretation; ability of performing main post mortal examination and taking tissue samples, their appropriate storing and transport; euthanasia; planning of therapy approach; technology of production, feed contents and hygiene in aspect of animal's health; creation and application of preventive and prophylactic programs (herd health) and maintenance of accepted health standards, as well as ethic standards and animal welfare and veterinary public health standards.</p> <p><b>Research:</b> ability of searching referent materials, data bases and other data resources; devising and performing experiments in the field of veterinary medicine; presentation and interpretation of results for making conclusions and ability for using of appropriate laboratory equipment and critical analysis of gained laboratory results.</p> <p><b>Practical skills:</b> clinical and other practical experiences under supervision; selection and application of appropriate scientific principles, methods and diagnostic procedures in animal production and biotechnology, in veterinary public health, as well as in preclinical and clinical veterinary medicine; ability for sublimation of theoretical and practical knowledge and skills for solving professional issues; skills in organization and management of veterinary practice.</p> <p><b>Complementary skills:</b> ability for individual and team work, i.e. interpretation (written and oral) of results from analyses and research; high consciousness for health, security and legal issues, and responsibility in veterinary profession and society; understanding of professional duties of need for professional improvement via continuous education and training during whole his/her professional life.</p>
4.3 Data on study program (direction/module, grade marks, ECTS credit points)	<p>First and second cycle integrated studies (5.5 years)</p> <p><b>Doctor of veterinary medicine</b></p> <p>330 ECTS credit points (Attachment Certificate on passed exams)</p>
4.4 Grade mark system (grade mark sheme with criteria for grade mark acquiring)	91–100 points – 10 (A), 81–90 points – 9 (B), 71–80 points – 8 (C), 61–70 points – 7 (D), 51–60 points – 6 (E), up to 50 points – 5 (F)
4.5 Average grade mark during studying	
<b>5. Data on use of qualification</b>	
5.1 Access to further studying	Postgraduate specialist studies or third cycle university studies – doctoral (PhD) studies
5.2 Professional status (if applicable)	Owner of this qualification is encharged to use trade mark academic title Doctor of veterinary medicine (DVM)
<b>6. Additional data</b>	
6.1 Additional data on student	/
6.2 Additional data on higher education institution	Ss. Cyril and Methodius University in Skopje, Faculty of Veterinary Medicine – Skopje, Lazar Pop Trajkov 5-7, Skopje, R. of Macedonia, tel: +389 2 3240 700, fax: +389 2 3114 619, e-mail: contact@fvm.ukim.edu.mk www.ukim.edu.mk; www.fvm.ukim.edu.mk; e-mail: veterina@ukim.edu.mk
<b>7. Verification of diploma supplement</b>	
7.1 Data and place	
7.2 Name and signature	
7.3 Signatory's position	Dean <span style="float: right;">Rector</span>
7.4 Seal	Seal of the unit <span style="float: right;">Seal of the University</span>

<b>8. Data on higher education system in Republic of Macedonia</b>	
8.1 Type of higher education institution, i.e. institution which realizes higher education	Higher educational institutions are: university and higher professional school. Higher educational institutions within the university are: faculty, academy of arts and higher professional school (university units). Scientific institutes are also included in university, as university units. University also can have included associate members. University is highest autonomous higher educational, scientific and artistic institution which unifies realization and development of higher education, science, arts and professionalism, and directly, via its units from various study fields, transfers knowledge from many scientific and artistic areas and disciplines, respectively. University integrates functions of its units (functional integration), and with its bodies obtains their coordinated activity and universal access in all its activities.
8.2 Type of studies	Academic studies are educating students for work in the field of science, higher education, public and private sector, in wider society, and also are educating them to apply and develop scientific and professional knowledge on an adequate level. Professional studies are obtaining students with adequate level of knowledge, skills and competencies for doing professional occupations and being able to be included in working processes right after graduation.
8.3 Accreditation of higher educational institution, i.e. institution which realizes higher education	According established procedure, delivers request for projects for accreditation and reaccreditation of study programs to the Higher Education Accreditation and Evaluation Board. The Board decides on this request, and after finding that all criteria according the law and appropriate bylaws are fulfilled, adopts decision on accreditation.
8.4 Structure of higher educational university (academic) study programmes	Most of first cycle study programs have duration of 8 semesters, with 240 ECTS credit points. Some first cycle studies have duration of 6 semesters, with 180 ECTS credit points. After study completion, students gain diploma for completed first cycle and professional qualification <i>graduated</i> with addition of appropriate area. Second cycle study programs have duration of 2 or 4 semesters, with 60 or 240 ECTS credit points, respectively. After study completion, students gain diploma for completed second cycle and scientific title <i>master of science (MSc.)</i> with addition of appropriate area. Integrated studies have duration of 10-12 semesters, with 300-360 ECTS credit points. After study completion, students gain diploma and academic title from appropriate area. Third cycle study programs have duration of 6 semesters, with 180 ECTS credit points. After study completion, students gain diploma for completed third cycle and scientific title <i>doctor of science (PhD)</i> or <i>doctor of arts (Art D)</i> with addition of appropriate area.
8.5 Structure of higher education professional studies	Professional first cycle studies can have duration of 6 or 8 semesters, with 180 or 240 ECTS credit points, respectively. After study completion, students gain diploma for completed first cycle and professional qualification <i>graduated</i> with addition of appropriate area. Exception are students graduated on technical sciences who gain professional qualification <i>graduated engineer</i> , with addition of the area. Specialistic second cycle studies can have duration of 2 or 4 semesters, with 60 or 120 ECTS credit points, respectively. After study completion, students gain diploma for completed second cycle specialistic studies and scientific title <i>specialist</i> with addition of appropriate area.
8.6 Student enrolment criteria	All conditions and criteria for enrolling candidates are defined in appropriate competition which is adopted every year. Criterion for enrolling first cycle studies and integrated studies is completed four year high school, and since school year 2008/2009, also passed stated matura or final exam. Some study programs demand some additional criteria with candidate knowledge and skills evaluation. Criterion for enrolling second cycle studies is completed first cycle studies. Condition for enrolling third cycle are completed first and second cycle studies.
8.7 Grading system	Higher educational grading system in RM contains five grades with numerical equivalents: 10 (exceptional), 9 (excellent), 8 (very good), 7 (good), 6 (sufficient) and 5 (insufficient). Lowest passing grade is 6 (sufficient). Macedonian grading scheme has no average grade marks. In addition of national grading scheme, some higher educational institutions use ECTS grading scheme.

STRUCTURE OF THE HIGHER EDUCATION SYSTEM IN REPUBLIC OF MACEDONIA

