GENERAL DATA OF THE CURRICULUM

Veterinary medicine (11897, in English language)

1.Level of study	Integrated veterinary medicine studies
2.Form of study	Stationary studies
3.Educational institution	Estonian University of Life Sciences (EMÜ)
4.Credit points (ECTS)	360 ECTS
5. Nominal length of studies	6 years
6. Study programme group	Veterinary Medicine
7. Admission requirements	*Upper secondary education or equivalent qualification. In addition, the University may establish additional admission requirements.*
8. General objectives of the curriculum	Prepare veterinarians with adequate knowledge, sufficient clinical skills and practical experience who can successfully work in different fields requiring veterinary education.
9. Learning outcomes of the curriculum	After completing the curriculum, the graduates will be expected to 1) have knowledge of basic veterinary sciences and know veterinary terminology terms; 2) know the principles of breeding, animal husbandry and animal nutrition and the technologies for fodder production and storage; 3) know the principles of animal behaviour and animal welfare, be familiar with the basics of veterinary legislation and surveillance and base their activities on the principles of professional ethics and relevant legislation; 4) know the changes in the function of the animal organism as a result of more frequent diseases and be able to place this knowledge in the clinical context; 5) know the causes, epidemiology, nature, course and pathogenesis of the main diseases occurring in animals, including those that can be transmitted to humans; 6) have the knowledge and clinical skills required to diagnose, treat and prevent animal diseases; 7) know the basics of food hygiene and food safety, including the principles of ante-mortem and post-mortem inspection of animals; 8) be able to carry out research: collect and process data, critically evaluate and scientifically analyse the obtained results, argue, explain and discuss theories, questions and conclusions related to their speciality, both in speech and in writing; 9) understand the issues at the human, animal and environment interface and know the principles of One Health, food security and sustainable management; 10) know how to communicate professionally with various stakeholders and target groups, are able to work in a team.

	11) master methods and techniques for promoting their health, well-being and professional development of themselves and others, be able to assess their personal professional development and the need for lifelong learning; 12) be ready to work as a practicing veterinarian, after appropriate further professional education as a specialist in state offices or private enterprises, as a lecturer at a higher educational establishment, continue their studies at the doctoral level or in an internship or after completing it, in residency, act as a developer of their speciality, including in an international environment.
10. Degree to be awarded	Degree in Veterinary Medicine (DVM)
11. Document issued at graduation	Diploma with diploma supplement
12. Brief description of the curriculum	The composition of the curriculum: - general module 18 ECTS, - speciality module 309 ECTS, - speciality elective subjects and optional subjects 11 ECTS, - final thesis 22 ECTS.
13. Options for passing the curriculum	Students can choose: *1)* between the following elective submodules of the speciality modules: production animal medicine, equine medicine, small animal medicine or food safety; *2)* speciality elective subjects and/or optional subjects.
14. Requirements for graduation	Completing the curriculum to the full extent and defending the final thesis.
15. Additional information	https://ois.emu.ee/pls/ois/!tere.tulemast

CURRICULUM MODULES, MODULES OBJECTIVES AND LEARNING OUTCOMES

GENERAL MODULE	**Size: 18 ECTS**
Objectives	Acquisition of knowledge and skills for further speciality studies.
Learning outcomes	Students who have passed the general module will be expected to: *1)* have an overview of cell and molecular biology and animal ecology; *2)* have an overview of conducting research, be able to retrieve scientific information from various sources; *3)* know the basics of statistical data processing, be able to perform less complicated statistical data analysis and compile datasets necessary for research; *4)* understand daily information in Estonian and use it passively and actively; is able to cope with standard communicative situations.
Evaluation of module: General module will be evaluated based on subjects.	

Subjects of general module:

VL.0607	Animal ecology (2 ECTS)
VL.1218	Basics of evidence-based veterinary medicine (2 ECTS)
VL.0567	Cell and molecular biology (3 ECTS)
KE.0069	Estonian for foreigners (3 ECTS)

VL.0413	Informatics and biometry (4 ECTS)
VL.1268	Introduction to veterinary studies (2 ECTS)
VL.0142	Veterinary mental health and self-care (2 ECTS)

Principles of choice: General module is obligatory.

SPECIALITY MODULE	**Size: 309 ECTS**
Objectives	Acquisition of knowledge, skills and competences on animal diseases and disease induced pathological changes, the diagnostics, treatment and prevention of diseases, animal husbandry, food hygiene, veterinary public health and the national veterinary and food surveillance system.
Learning outcomes	**Submodule of the specialty module: Preclinical sciences** Students will be expected to: 1) know the anatomy and functions of a healthy animal organism; 2) know the structure, morphology, growth and reproduction of bacteria, microbial taxonomy and pathogenicity mechanisms; 3) have a systematic understanding of the biochemical functioning of organisms; 4) have an overview of viruses, their structure and chemical composition; know viral diseases at the cellular, animal and population level; 5) know the structure and development of cells and tissues; 6) have an overview of the groups of medicinal products and active substances used in veterinary medicine, as well as their effect on different species of animals; 7) know the professional terminology in Latin; 8) have a thorough understanding of both normal and pathological morphology and functions at organism, tissue and cellular levels, know and be able to describe the structural and functional changes in the animal organism in the event of disease; 9) be familiar with the most common pathogens relevant for veterinary medicine, know their structure, function and genetics, mechanisms of parasitism and other biological characteristics; 10) know the basic concepts and application of quantitative epidemiology in veterinary medicine. **Submodule of the specialty module: Basics of animal production** Students will be expected to: 1) be familiar with the behaviour, welfare and protection of animals and their connections to animal husbandry technologies; 2) have knowledge of plant breeding as related to animal feed production; 3) understand the principles of veterinary genetics and breeding; 4) know the principles of keeping and feeding different farm animals; 5) be familiar with the organization of livestock production management, have an overview of the economics of agricultural production. **Submodule of the speciality module: Clinical sciences** Students will be expected to: 1) know the most common diseases of different animal species (incl. birds, fish and exotic animals); know the principles of their diagnosis, treatment and prevention; have the knowledge and skills to detect disease both in an individual animal and in a group;

	2) know the characteristics of the main groups of medicines used in veterinary medicine, their properties, main effects and pharmacokinetics; 3) be able to independently perform simpler diagnostic and treatment procedures on animals; 4) know the normal and pathological course of reproduction and calving theoretically and practically; 5) be familiar with the different methods of analgesia and anaesthesia used in animals; 6) know professional ethics, be able to construct ethical arguments concerning animals and be aware of the ethical dilemmas in the work of a veterinarian; 7) have knowledge and skills in the field of forensic veterinary medicine; 8) have an overview of the research methods applied in veterinary science, planning scientific research, composing a research plan, as well as the principles of analysis and reporting of research results. **Submodule of the speciality module: Food hygiene and veterinary public health** Students will be expected to: 1) have basic knowledge of veterinary prophylaxis and be able to describe the connections between animal diseases and human health; 2) know the biological, chemical and physical hazards associated with the food production, processing and consumption chain; 3) be familiar with the properties, effects and metabolism of the most common foodborne toxic agents; 4) know the principles of self-control and food safety systems and be able to apply them in practice; 5) be familiar with the general production principles of raw material of animal origin (meat, milk) and the factors affecting the safety and quality of animal and plant products; 6) know the organisation and the principles of operation and tasks of the national veterinary and food surveillance system, be knowledgeable about veterinary and food legislation and have the practical skills necessary for veterinary surveillance. **<u>6th academic year</u>** **Elective submodule of the speciality module: Production animal medicine (E1)** Students will be expected to: 1) be able to assess and analyse the herd health status of production animals and conduct herd health improvement programs. 2) can advise the animal owner on the prevention, diagnostics and treatment of production animal diseases, as well as on animal husbandry and nutrition; 3) has communication and teamwork skills; knows conflict management techniques; 4) have sufficient knowledge to set up a private veterinary practice; **Elective submodule of the speciality module: Equine medicine (E2)** Students will be expected to 1) have in-depth knowledge and skills in the prevention, diagnostics and treatment of equine diseases; 2) know medical terminology and knows how to draw up a medical history;

	3) have professional communication skills in speech and writing; 4) have teamwork skills; knows conflict management techniques; 5) Have sufficient knowledge to set up a private veterinary practice; **Elective submodule of the speciality module: Small animal medicine (E3)** Students will be expected to: 1) have in-depth knowledge and skills in the prevention, diagnostics and treatment of small animal diseases; 2) know medical terminology and knows how to draw up a medical history; 3) have professional communication skills in speech and writing; 4) have teamwork skills; knows conflict management techniques; 5) have sufficient knowledge to set up a private veterinary practice; **Elective submodule of the speciality module: Food safety (E4)** Students will be expected to: 1) can apply the principles of "One Health" in ensuring food safety; 2) have in-depth knowledge and skills for the safe production and processing of food at various stages of stages of the food production and processing chain (“from farm to fork”); 3) know the food hygiene criteria for food safety and food production process arising from legislation and analyse their significance in ensuring food safety and hygiene; 4) know the basic processes of food technology and relate the impact of technologies to ensuring food safety; can communicate professionally and recognize violations in animal welfare and make proper evaluations and decisions.

Evaluation of module: Speciality module will be evaluated based on subjects.

<u>Subjects of speciality module</u>

Submodule of the speciality module: Preclinical Sciences (83 ECTS)

VL.1278	Anatomy of domestic animals I (5 ECTS)
VL.1279	Anatomy of domestic animals II (5 ECTS)
VL.0260	Anatomy of domestic animals III (4 ECTS)
VL.1372	Animal physiology I (5 ECTS)
VL.1296	Animal physiology II (4 ECTS)
VL.1274	Artificial insemination and reproduction I (3 ECTS)
VL.1275	Artificial insemination and reproduction II (3 ECTS)
VL.1293	Cytology, embryology and histology I (4 ECTS)
VL.1294	Cytology, embryology and histology II (4 ECTS)
VL.1373	General microbiology (3 ECTS)
VL.0335	Pathophysiology (6 ECTS)
VL.1263	Pathological morphology I (4 ECTS)
VL.1264	Pathological morphology II (3 ECTS)
VL.0577	Pharmacology (4 ECTS)
VL.0983	Special microbiology (3 ECTS)
VL.0770	Veterinary biochemistry (11 ECTS)
VL.0508	Veterinary epidemiology (4 ECTS)
VL.1345	Veterinary immunology (4 ECTS)
VL.0984	Virology (4 ECTS)

Submodule of the speciality module: Basics of animal production (32 ECTS)

VL.0135 Animal hygiene (5 ECTS)
VL.0193 Animal nutrition (5 ECTS)
VL.0818 Animal production (6 ECTS)
VL.0651 Animal welfare and protection (2 ECTS)
VL.0042 Ethology (2 ECTS)
PK.1558 Fundamentals of agronomy for veterinarians (2 ECTS)
VL.0822 Practical training on livestock farm (3 ECTS)
VL.0246 Small animal nutrition (2 ECTS)
VL.0786 Veterinary genetics and animal breeding (5 ECTS)

Submodule of the speciality module: Clinical sciences (125 ECTS)

VL.0491 Anaesthesiology (3 ECTS)
VL.1280 Animal infectious diseases I (3 ECTS)
VL.1281 Animal infectious diseases II (3 ECTS)
VL.0827 Aquacultivation technologies, fish and crayfish diseases and hygiene (3 ECTS)
VL.0821 Artificial insemination and veterinary nurse training (3 ECTS)
VL.0411 Clinical pharmacology (4 ECTS)
VL.1277 Clinical-laboratory diagnostics of equine (2 ECTS)
VL.1276 Clinical-laboratory diagnostics of production animals (2 ECTS)
VL.1300 Clinical-laboratory diagnostics of small animals (2 ECTS)
VL.1132 Dermatology and allergology (2 ECTS)
VL.1349 Emergency medicine and critical care (2 ECTS)
VL.0641 Endocrinology (3 ECTS)
VL.0831 Equine clinical medicine (4 ECTS)
VL.1295 Forensic veterinary medicine (1 ECTS)
VL.1161 Herd health and environment (2 ECTS)
VL.0180 Medicine of exotic animals (2 ECTS)
VL.0586 Neurology (2 ECTS)
VL.1282 Obstetrics and gynaecology I (4 ECTS)
VL.1283 Obstetrics and gynaecology II (4 ECTS)
VL.0836 Ophthalmology (2 ECTS)
VL.0121 Parasitology and parasitic diseases (5 ECTS)
VL.1265 Pathological morphology and necropsy (3 ECTS)
VL.1301 Poultry diseases (3 ECTS)
VL.1370 Practical training in equine medicine (6 ECTS)
VL.1269 Practical training in production animal medicine (6 ECTS)
VL.0426 Practical training in small animal emergency medicine (2 ECTS)
VL.1371 Practical training in small animal medicine (8 ECTS)
VL.0796 Professional ethics (1 ECTS)
VL.1284 Research methodology in veterinary medicine (1 ECTS)
VL.1163 Ruminant clinical medicine (7 ECTS)
VL.1285 Small animal internal medicine I (4 ECTS)
VL.1286 Small animal internal medicine II (4 ECTS)
VL.1287 Surgery I (3 ECTS)
VL.1288 Surgery II (4 ECTS)
VL.1289 Surgery III (3 ECTS)
VL.1165 Swine clinical medicine (3 ECTS)
VL.1340 Veterinary clinical skills (1 ECTS)
VL.0825 Veterinary practice and management (3 ECTS)
VL.0905 Veterinary radiology (5 ECTS)

Submodule of the speciality module: Food hygiene and veterinary public health (33 ECTS)

VL.1166 Basics of veterinary public health and food hygiene (4 ECTS)
VL.1299 Environmental and food toxicology (3 ECTS)
VL.1168 Food production hygiene (6 ECTS)
VL.0434 Meat inspection (5 ECTS)
VL.0177 Organization of veterinary services and veterinary legislation (2 ECTS)
VL.0833 Practical training in meat inspection (2 ECTS)
VL.0828 Practical training in veterinary surveillance (2 ECTS)
VL.1025 Quality and safety of milk and dairy products (5 ECTS)
VL.1162 Technology, safety and quality of meat products (4 ECTS)

6th academic year

Elective submodule of the speciality module: Production animal medicine E1 (36 ECTS)

VL.0266 Cattle health management (10 ECTS)
VL.0113 Client communication and practice management (2 ECTS)
VL.0468 Clinical training in production animal medicine (15 ECTS)
VL.1273 Health management of small ruminants (4 ECTS)
VL.1348 Pig health management (5 ECTS)

Elective submodule of the speciality module: Equine medicine (E2) (36 ECTS)

VL.0532 Advanced course in equine medicine (19 ECTS)
VL.0113 Client communication and practice management (2 ECTS)
VL.0697 Clinical training in equine medicine (15 ECTS)

Elective submodule of the speciality module: Small animal medicine (E3) (36 ECTS)

VL.0045 Advanced course in small animal medicine (19 ECTS)
VL.0113 Client communication and practice management (2 ECTS)
VL.0178 Clinical training in small animal medicine (15 ECTS)

Elective submodule of the speciality module: Food safety (E4) (36 ECTS)

VL.0538 Animal welfare assessment in food surveillance (3 ECTS)
VL.0317 Basics of food legislation (3 ECTS)
VL.1354 Case studies in food safety (4 ECTS)
VL.0113 Client communication and practice management (2 ECTS)
VL.1344 Food microbiota (6 ECTS)
VL.1351 Food technology in food surveillance (6 ECTS)
VL.0336 Human nutrition (4 ECTS)
VL.0287 Principles and methods of risk assessment in food safety (6 ECTS)
VL.0074 Quality and safety of organic food (2 ECTS)

Principles of selection:

1) Speciality submodules: Preclinical sciences, Basics of animal production, Clinical sciences and Food hygiene and veterinary public health are obligatory.
2) In the 6th academic year, students will choose between the following elective submodules of the speciality module: “Production animal medicine”, “Equine medicine”, “Small animal medicine”, or “Food safety”.

SPECIALITY ELECTIVE SUBJECTS AND OPTIONAL SUBJECTS	**Size: 11 ECTS**
Objectives	Acquisition of additional knowledge and skills supporting individual development.

Learning outcomes	Knowledge and skills described in the learning outcomes of the subject.
Evaluation of module: The module will be evaluated based on subjects.	
Speciality elective subjects:	
VL.1342	Animal Physiotherapy (2 ECTS)
VL.1213	Aquarium and laboratory fishkeeping (2 ECTS)
VL.0665	Biotechnology of reproduction (2 ECTS)
VL.0125	Diseases of bees (2 ECTS)
VL.1341	Diversity in animal kingdom (4 ECTS)
VL.0734	Dog husbandry (4 ECTS)
KE.0080	Estonian intermediate (3 ECTS)
VL.1353	Equine surgery (2 ECTS)
VL.0237	Medicine of laboratory animals (2 ECTS)
VL.0265	Pain (1 ECTS)
VL.0057	Practical training in equine emergency care and night shifts (2 ECTS)
VL.0319	Equine exercise physiology (2 ECTS)
VL.1207	Terrarium animals and their healthcare (2 ECTS)
VL.1144	World animal production (2 ECTS)
VL.0745	Zoo and wild animal medicine (2 ECTS)
VL.0057	Practical training in equine emergency care and night shifts (2 ECTS)
VL.1374	Practical training in small animals emergency care and night shifts (3 ECTS)
Principles of selection: 1) Students can choose subjects from speciality elective subjects and/or 2) optional subjects from Estonian University of Life Sciences and/or other institutions of higher education (including foreign universities).	

FINAL THESIS	Size: 22 ECTS
Objectives	The aim of the final thesis is to provide students with the skills and experience necessary for compiling independent professional research within the predetermined time frame through assessing the quality of various forms of sources and information, by demonstrating the ability to explain the research questions and their solution both orally and in writing, as well as to develop the students' self-confidence, identify their personal need for further knowledge in the field and enhance their professional confidence.
Learning outcomes	Students having compiled the final thesis will be expected to: *1)* has a systematic overview and in-depth knowledge in the field of research topic and is able to plan and carry out scientific research under guidance and follows the principles of scientific ethics; *2)* knows how to work with professional scientific literature and present opinions review and analyse the theories relevant to his/her research; *3)* is able to define and formulate research problems, set the aims of the research and research tasks; *4)* can choose appropriate research methodology, collect, process and interpret data; *5)* is able to present and give reasoned explanations for the research results achieved and make generalisations; *6)* is able to use scientific language in the research reports and follow the formatting guidelines set to research reports;

	7) is able to present and defend his/her research in public and defend their standpoints.
Evaluation	The final thesis is evaluated by the Defense Board on the basis of the evaluation system valid at the University: A - excellent; B - very good; C - good; D - satisfactory; E - sufficient; F - insufficient.