

## GENERAL DATA OF THE CURRICULUM

### Veterinary medicine (11897, in English language)

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| <b>1.Level of study</b>                        | Integrated veterinary medicine studies   |
| <b>2.Form of study</b>                         | Stationary studies   |
| <b>3.Educational institution</b>               | Estonian University of Life Sciences (EMÜ)   |
| <b>4.Credit points (ECTS)</b>                  | 360 ECTS   |
| <b>5. Nominal length of studies</b>            | 6 years  |
| <b>6. Study programme group</b>                | Veterinary Medicine  |
| <b>7. Admission requirements</b>               | Secondary education or a foreign qualification equal thereto. In addition the Council of the University may establish additional admission requirements.   |
| <b>8. General objectives of the curriculum</b> | Prepare veterinarians with adequate knowledge, sufficient clinical skills and practical experience who can successfully work in different fields requiring veterinary education.   |
| <b>9. Learning outcomes of the curriculum</b>  | <p>After completing the curriculum, the graduates will be expected to</p> <ol style="list-style-type: none"><li>1) have theoretical knowledge of the basics of animal health, including knowledge of animal anatomy, the structure and functions of organisms, the behaviour of animals, the basics of animal husbandry, breeding and nutrition, and the technologies of feed production and storage; know the terminology in Latin;</li><li>2) know and follow the principles of animal welfare and animal protection;</li><li>3) 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, know the causes, nature, course and pathogenesis of the main diseases occurring in animals, including those which can be transmitted to humans; have the clinical skills required to diagnose, treat and prevent animal diseases; be able to communicate in veterinary matters with the animal owner and general public;</li><li>4) be familiar with the requirements of food hygiene, food and feed safety and surveillance;</li><li>5) be familiar with professional ethics and legislation;</li><li>6) be able to carry out independent research: process data, evaluate and analyse the obtained results, argue, explain and discuss theories, questions and conclusions related to their speciality, both in speech and in writing, and participate in discussions with specialists and non-specialists;</li><li>7) be ready to work as a veterinarian in an animal clinic, as a specialist in state offices, as a lecturer at a university; be able to continue studies at the doctoral level or in an internship or residency</li></ol> |

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|  | abroad, be able to develop their speciality, incl. abroad;<br>8) be able to assess their personal professional development and the need for continuing education.                            |
| <b>10. Degree to be awarded</b>                | Degree in Veterinary Medicine (DVM)  |
| <b>11. Document issued at graduation</b>       | Diploma with diploma supplement  |
| <b>12. Brief description of the curriculum</b> | The composition of the curriculum:<br>- general module 18 ECTS,<br>- speciality module 316 ECTS,<br>- speciality elective subjects and optional subjects 11 ECTS,<br>- final thesis 15 ECTS. |
| <b>13. Options for passing the curriculum</b>  | Students can choose:<br>1) Production animal and equine medicine or Small animal medicine sub-module;<br>2) speciality elective subjects and/or optional subjects.                           |
| <b>14. Requirements for graduation</b>         | Completing the curriculum to the full extent and defending the final thesis.   |
| <b>15. Additional information</b>              | <a href="https://ois.emu.ee/pls/ois/!tere.tulemast">https://ois.emu.ee/pls/ois/!tere.tulemast</a>  |

## CURRICULUM MODULES, MODULES OBJECTIVES AND LEARNING OUTCOMES

| GENERAL MODULE  |  | Size: 18 ECTS |
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| Objectives  | Acquisition of knowledge and skills for further speciality studies.  |               |
| Learning outcomes   | Students who have passed the general module will be expected to:<br>1) have an overview of cell and molecular biology and animal ecology;<br>2) have an overview of conducting research, be able to retrieve scientific information from various sources;<br>3) know the basics of statistical data processing, be able to perform less complicated statistical data analysis and compile datasets necessary for research;<br>4) understand daily information in Estonian and use it passively and actively; is able to cope with standard communicative situations. |               |
| Evaluation of module: At the end of the courses by way of examination or pass/fail examination.   |  |               |
| <u>Subjects of general module:</u><br>VL.0607      Animal ecology (2 ECTS)<br>VL.1218      Basics of evidence-based veterinary medicine (2 ECTS)<br>VL.0567      Cell and molecular biology (3 ECTS)<br>KE.0069      Estonian for foreigners (3 ECTS)<br>VL.0413      Informatics and biometry (4 ECTS)<br>VL.1268      Introduction to veterinary studies (2 ECTS)<br>VL.0142      Veterinary mental health and self-care (2 ECTS) |  |               |
| Principles of choice: General module is obligatory.   |  |               |

| <b>SPECIALITY MODULE</b> |  | <b>Size: 316 ECTS</b> |
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| <b>Objectives</b>        | 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.  |                       |
| <b>Learning outcomes</b> | <p><b>Submodule of the specialty module: Preclinical sciences</b><br/>Students will be expected to:</p> <ol style="list-style-type: none"> <li>1) know the anatomy and functions of a healthy animal organism;</li> <li>2) know the structure, morphology, growth and reproduction of bacteria, microbial taxonomy and pathogenicity mechanisms;</li> <li>3) have a systematic understanding of the biochemical functioning of organisms;</li> <li>4) have an overview of viruses, their structure and chemical composition; know viral diseases at the cellular, animal and population level;</li> <li>5) know the structure and development of cells and tissues;</li> <li>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;</li> <li>7) know the professional terminology in Latin;</li> <li>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;</li> <li>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;</li> <li>10) know the basic concepts and application of quantitative epidemiology in veterinary medicine.</li> </ol> <p><b>Submodule of the specialty module: Basics of animal production</b><br/>Students will be expected to:</p> <ol style="list-style-type: none"> <li>1) be familiar with the behaviour, welfare and protection of animals and their connections to animal husbandry technologies;</li> <li>2) have sufficient knowledge of plant production as related to the production of animal feeds;</li> <li>3) understand the principles of population genetics and be able to relate these principles to the breeding practices of production animals; know the basics of genetic hygiene;</li> <li>4) know the principles of keeping and feeding different farm animals;</li> <li>5) be familiar with the organization of livestock production management, have an overview of the economics of agricultural production, as well as basic knowledge of economic accounting, including animal health economics.</li> </ol> <p><b>Submodule of the specialty module: Clinical sciences</b><br/>Students will be expected to:</p> <ol style="list-style-type: none"> <li>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;</li> <li>2) know the characteristics of the main groups of medicines used in veterinary medicine, their properties, main effects and pharmacokinetics;</li> <li>3) be able to independently perform simpler diagnostic and treatment procedures on animals;</li> </ol> |                       |

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|   | <ol style="list-style-type: none"> <li>4) know the normal and pathological course of reproduction and calving theoretically and practically;</li> <li>5) be familiar with the different methods of analgesia and anaesthesia used in animals;</li> <li>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;</li> <li>7) have knowledge and skills in the field of forensic veterinary medicine;</li> <li>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.</li> </ol> <p><b>Submodule of the speciality module: Food hygiene and veterinary public health</b></p> <p>Students will be expected to:</p> <ol style="list-style-type: none"> <li>1) have basic knowledge of veterinary prophylaxis and be able to describe the connections between animal diseases and human health;</li> <li>2) know the biological, chemical and physical hazards associated with the food production, processing and consumption chain;</li> <li>3) be familiar with the properties, effects and metabolism of the most common foodborne toxic agents;</li> <li>4) know the principles of self-control and food safety systems and be able to apply them in practice;</li> <li>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;</li> <li>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.</li> </ol> <p><b>Submodule of the speciality module: Production animal and equine medicine</b></p> <p>Students will be expected to:</p> <ol style="list-style-type: none"> <li>1) have in-depth knowledge and skills of equine diseases, their diagnosis, treatment and prevention;</li> <li>2) be able to assess and analyse the herd health status of production animals and conduct herd health improvement programs.</li> </ol> <p><b>Submodule of the speciality module: Small animal medicine</b></p> <p>Students will be expected to:</p> <ol style="list-style-type: none"> <li>1) have in-depth knowledge and skills of the diseases of small animals, their diagnosis, treatment and prevention;</li> <li>2) be able to explain to the animal owner the causes, diagnostics and treatment options of small animal diseases, and advise the owners on small animal management, nutrition and disease prevention options.</li> </ol> |
| <b>Evaluation of module:</b> Speciality module will be evaluated based on subjects.   |  |
| <p><b><u>Subjects of speciality module</u></b></p> <p><b><i>Submodule of the speciality module: Preclinical Sciences (83 ECTS)</i></b></p> <p>VL.1278     <i>Anatomy of domestic animals I (5 ECTS)</i></p> <p>VL.1279     <i>Anatomy of domestic animals II (5 ECTS)</i></p> <p>VL.0260     <i>Anatomy of domestic animals III (4 ECTS)</i></p> <p>VL.1297     <i>Animal physiology I (4 ECTS)</i></p> <p>VL.1296     <i>Animal physiology II (4 ECTS)</i></p> |  |

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| VL.1274 | <i>Artificial insemination and reproduction I (3 ECTS)</i>  |
| VL.1275 | <i>Artificial insemination and reproduction II (3 ECTS)</i> |
| VL.1293 | <i>Cytology, embryology and histology I (4 ECTS)</i>        |
| VL.1294 | <i>Cytology, embryology and histology II (4 ECTS)</i>       |
| VL.1271 | <i>General microbiology (4 ECTS)</i>                        |
| VL.0335 | <i>General pathology (pathological physiology) (6 ECTS)</i> |
| VL.1263 | <i>Pathological morphology I (4 ECTS)</i>                   |
| VL.1264 | <i>Pathological morphology II (3 ECTS)</i>                  |
| VL.0577 | <i>Pharmacology (4 ECTS)</i>                                |
| VL.0983 | <i>Special microbiology (3 ECTS)</i>                        |
| VL.0770 | <i>Veterinary biochemistry (11 ECTS)</i>                    |
| VL.0508 | <i>Veterinary epidemiology (4 ECTS)</i>                     |
| VL.1345 | <i>Veterinary immunology (4 ECTS)</i>                       |
| VL.0984 | <i>Virology (4 ECTS)</i>                                    |

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

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

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

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| VL.0491 | <i>Anaesthesiology (3 ECTS)</i>  |
| VL.1280 | <i>Animal infectious diseases I (3 ECTS)</i>   |
| VL.1281 | <i>Animal infectious diseases II (3 ECTS)</i>  |
| VL.0827 | <i>Aquacultivation technologies, fish and crayfish diseases and hygiene (3 ECTS)</i> |
| VL.0821 | <i>Artificial insemination and veterinary nurse training (3 ECTS)</i>                |
| VL.0411 | <i>Clinical pharmacology (4 ECTS)</i>  |
| VL.1277 | <i>Clinical-laboratory diagnostics of equine (2 ECTS)</i>                            |
| VL.1276 | <i>Clinical-laboratory diagnostics of production animals (2 ECTS)</i>                |
| VL.1300 | <i>Clinical-laboratory diagnostics of small animals (2 ECTS)</i>                     |
| VL.1132 | <i>Dermatology and allergology (2 ECTS)</i>  |
| VL.1349 | <i>Emergency medicine and critical care (2 ECTS)</i>                                 |
| VL.0641 | <i>Endocrinology (3 ECTS)</i>  |
| VL.0831 | <i>Equine clinical medicine (4 ECTS)</i>   |
| VL.1295 | <i>Forensic veterinary medicine (1 ECTS)</i>   |
| VL.1161 | <i>Herd health and environment (2 ECTS)</i>  |
| VL.0180 | <i>Medicine of exotic animals (2 ECTS)</i>   |
| VL.0586 | <i>Neurology (2 ECTS)</i>  |
| VL.1282 | <i>Obstetrics and gynaecology I (4 ECTS)</i>   |
| VL.1283 | <i>Obstetrics and gynaecology II (4 ECTS)</i>  |
| VL.0836 | <i>Ophthalmology (2 ECTS)</i>  |
| VL.0121 | <i>Parasitology and parasitic diseases (5 ECTS)</i>                                  |
| VL.1265 | <i>Pathological morphology and necropsy (3 ECTS)</i>                                 |
| VL.1301 | <i>Poultry diseases (3 ECTS)</i>   |
| VL.1270 | <i>Practical training in equine medicine (4 ECTS)</i>                                |

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| VL.1269 | <i>Practical training in production animal medicine (6 ECTS)</i>      |
| VL.0426 | <i>Practical training in small animal emergency medicine (2 ECTS)</i> |
| VL.0737 | <i>Practical training in small animal medicine (10 ECTS)</i>          |
| VL.0796 | <i>Professional ethics (1 ECTS)</i>                                   |
| VL.1284 | <i>Research methodology in veterinary medicine (1 ECTS)</i>           |
| VL.1163 | <i>Ruminant clinical medicine (7 ECTS)</i>                            |
| VL.1285 | <i>Small animal internal medicine I (4 ECTS)</i>                      |
| VL.1286 | <i>Small animal internal medicine II (4 ECTS)</i>                     |
| VL.1287 | <i>Surgery I (3 ECTS)</i>   |
| VL.1288 | <i>Surgery II (4 ECTS)</i>  |
| VL.1289 | <i>Surgery III (3 ECTS)</i>   |
| VL.1165 | <i>Swine clinical medicine (3 ECTS)</i>                               |
| VL.1340 | <i>Veterinary clinical skills (1 ECTS)</i>                            |
| VL.0825 | <i>Veterinary practice and management (3 ECTS)</i>                    |
| VL.0905 | <i>Veterinary radiology (5 ECTS)</i>                                  |

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

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

**Submodule of the speciality module: Production animal and equine medicine (43 ECTS)**

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| VL.1238 | <i>Advanced equine medicine (6 ECTS)</i>             |
| VL.1347 | <i>Cattle health management (11 ECTS)</i>            |
| VL.1273 | <i>Health management of small ruminants (4 ECTS)</i> |
| VL.1346 | <i>Large animal clinical training (17 ECTS)</i>      |
| VL.1348 | <i>Pig health management (5 ECTS)</i>                |

**Submodule of the speciality module: Small animal medicine (43 ECTS)**

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| VL.1318 | <i>Small animal clinical training (24 ECTS)</i> |
| VL.1298 | <i>Small animal medicine (19 ECTS)</i>          |

**Principles of selection:**

- 1) Speciality submodules: Preclinical sciences, Basics of animal production, Clinical sciences and Food hygiene and veterinary public health are obligatory.
- 2) Students will choose the Production animal and equine medicine or Small animal medicine speciality submodule.

| 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: at the end of subjects with examination or preliminary examination. |   |               |
| Speciality elective subjects:   |   |               |

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| VL.1342   | <i>Animal Physiotherapy (2 ECTS)</i>                   |
| VL.1213   | <i>Aquarium and laboratory fishkeeping (2 ECTS)</i>    |
| VL.0665   | <i>Biotechnology of reproduction (2 ECTS)</i>          |
| VL.0125   | <i>Diseases of bees (2 ECTS)</i>                       |
| VL.1341   | <i>Diversity in animal kingdom (4 ECTS)</i>            |
| VL.0734   | <i>Dog husbandry (4 ECTS)</i>                          |
| KE.0080   | <i>Estonian intermediate (3 ECTS)</i>                  |
| VL.0237   | <i>Medicine of laboratory animals (2 ECTS)</i>         |
| VL.0265   | <i>Pain (1 ECTS)</i>                                   |
| VL.0319   | <i>Sports physiology and doping (2 ECTS)</i>           |
| VL.1207   | <i>Terrarium animals and their healthcare (2 ECTS)</i> |
| VL.1144   | <i>World animal production (2 ECTS)</i>                |
| VL.0745   | <i>Zoo and wild animal medicine (2 ECTS)</i>           |
| <b>Principles of selection:</b><br>1) Students can choose subjects from speciality elective subjects and/or<br>2) optional subjects from Estonian University of Life Sciences and/or other institutions of higher education (including foreign universities). |  |

| <b>FINAL THESIS</b>      |   | Size: 15 ECTS |
|--------------------------|---|---------------|
| <b>Objectives</b>        | 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.  |               |
| <b>Learning outcomes</b> | Students having compiled the final thesis will be expected to:<br>1) have a systematic overview and a greater insight to the topic of the final thesis;<br>2) be able to explain the aim, tasks and novelty of the topic of the final thesis, be able to present the points of view published in professional literature and evaluate them;<br>3) be able to choose appropriate research methodology and process data;<br>4) be able to write and formalize the final thesis in accordance with the set requirements; be able to defend the points of view presented in the final thesis. |               |
| <b>Evaluation</b>        | 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.   |               |