Study Guide Veterinary Medicine

Zurich, 2011
# Table of Contents

1 The Vetsuisse Faculty University of Zurich  
1.1 About the Vetsuisse Faculty  
1.2 About the Veterinary Teaching Hospital  

2 UZH International  
2.1 International Relations Office University of Zurich  
2.2 Campus life  
2.3 Socrates / Erasmus Program at the Vetsuisse Faculty  
2.3.1 Semester exchange program  
2.3.2 Clinical rotation program  
2.3.3 Socrates / Erasmus coordination  
2.3.4 Learning agreement  
2.3.5 Application  

3 Admission of regular students  
3.1 Compulsory matriculation for all students  
3.2 UZH Card  
3.3 Veterinary Medicine Association  

4 Information regarding lectures  
4.1 Lecture Halls  
4.2 Module booking  
4.3 Study Material  
4.4 Libraries and Resource Centres  
4.5 E-Learning  
4.6 Mailing lists  
4.7 Parking  

5 Assessments  
5.1 Guidelines for Erasmus Examinations  
5.1.1 Registration/Deregistration  
5.1.2 Dates of examinations  
5.1.3 Type of examination and content  
5.1.4 Examination results  
5.1.5 Repeating Options  
5.2 Transcript of records  
5.3 Grades
## Table of Contents

**Study Guide Veterinary Medicine**

<table>
<thead>
<tr>
<th>6 Maps</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Semester Dates</td>
<td>15</td>
</tr>
<tr>
<td><strong>8 Bachelor and Master Study Program</strong></td>
<td>16</td>
</tr>
<tr>
<td>8.1 Bachelor Program Veterinary Medicine</td>
<td>16</td>
</tr>
<tr>
<td>8.2 Master Program Veterinary Medicine</td>
<td>17</td>
</tr>
<tr>
<td>8.3 Swiss Federal Diploma</td>
<td>18</td>
</tr>
<tr>
<td><strong>9 Overview of the Study Program</strong></td>
<td>19</td>
</tr>
<tr>
<td>9.1 Course of Studies Bachelor of Veterinary Medicine (B Med Vet)</td>
<td>19</td>
</tr>
<tr>
<td>9.2 Course of Studies Master of Veterinary Medicine (M Med Vet)</td>
<td>19</td>
</tr>
<tr>
<td><strong>10 Detailed Overview Lectures (Bachelor): 2nd Academic Year</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>11 Detailed Overview Lectures (Bachelor): 3rd Academic Year</strong></td>
<td>21</td>
</tr>
<tr>
<td><strong>12 Detailed Overview Lectures (Master): 4th Academic Year</strong></td>
<td>22</td>
</tr>
<tr>
<td><strong>13 Detailed Overview Master 2nd Academic Year</strong></td>
<td>23</td>
</tr>
<tr>
<td><strong>14 Postgraduate student education</strong></td>
<td>24</td>
</tr>
<tr>
<td><strong>15 Lectures at the Vetsuisse Faculty</strong></td>
<td>25</td>
</tr>
<tr>
<td>15.1 Timetable</td>
<td>25</td>
</tr>
<tr>
<td>15.2 Language Proficiency</td>
<td>25</td>
</tr>
<tr>
<td>15.3 Challenges for Erasmus Students</td>
<td>26</td>
</tr>
<tr>
<td><strong>16 Term program of the Bachelor Degree</strong></td>
<td>27</td>
</tr>
<tr>
<td>16.1 1st Academic Year</td>
<td>27</td>
</tr>
<tr>
<td>16.2 2nd Academic Year</td>
<td>29</td>
</tr>
<tr>
<td>16.3 3rd Academic Year</td>
<td>30</td>
</tr>
<tr>
<td><strong>17 Term program of the Master Degree</strong></td>
<td>31</td>
</tr>
<tr>
<td>17.1 1st Academic Year</td>
<td>31</td>
</tr>
<tr>
<td>17.2 2nd Academic Year, Clinical rotation program</td>
<td>32</td>
</tr>
<tr>
<td><strong>18 Study Guide Bachelor Degree</strong></td>
<td>34</td>
</tr>
<tr>
<td>Module</td>
<td>General Surgery</td>
</tr>
<tr>
<td>Module</td>
<td>General Histology and Physiology</td>
</tr>
<tr>
<td>Module</td>
<td>General Pathology</td>
</tr>
<tr>
<td>Module</td>
<td>Title</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Module</td>
<td>General Pharmacology and Toxicology</td>
</tr>
<tr>
<td>Module</td>
<td>General Zootechnics</td>
</tr>
<tr>
<td>Module</td>
<td>Bacteriology</td>
</tr>
<tr>
<td>Module</td>
<td>Occupational Studies</td>
</tr>
<tr>
<td>Module</td>
<td>Musculoskeletal System Integrated</td>
</tr>
<tr>
<td>Module</td>
<td>Biochemistry I</td>
</tr>
<tr>
<td>Module</td>
<td>Biochemistry II</td>
</tr>
<tr>
<td>Module</td>
<td>Biology I</td>
</tr>
<tr>
<td>Module</td>
<td>Biology II</td>
</tr>
<tr>
<td>Module</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Module</td>
<td>Ethology, Animal Welfare and Animal Husbandry</td>
</tr>
<tr>
<td>Module</td>
<td>Epidemiology and Biostatistics</td>
</tr>
<tr>
<td>Module</td>
<td>Fundamentals in Anatomy and Physiology</td>
</tr>
<tr>
<td>Module</td>
<td>Immunology</td>
</tr>
<tr>
<td>Module</td>
<td>Clinical Case Demonstrations</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Locomotor System</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Blood, Immune Organs, Laboratory Medicine</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Reproductive Organs, Mammary Gland</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Skin, Thermoregulation</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Heart, Circulation, Respiration</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Kidney, Salt- / Water Balance</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module Digestion and Metabolism</td>
</tr>
<tr>
<td>Module</td>
<td>Organ system module CNS, Sensory Organs</td>
</tr>
<tr>
<td>Module</td>
<td>Parasitology</td>
</tr>
<tr>
<td>Module</td>
<td>Physics</td>
</tr>
<tr>
<td>Module</td>
<td>Propaedeutic</td>
</tr>
<tr>
<td>Module</td>
<td>Radiation Physics and General Radiology</td>
</tr>
<tr>
<td>Module</td>
<td>Veterinary Public Health I</td>
</tr>
<tr>
<td>Module</td>
<td>Veterinary Public Health I</td>
</tr>
<tr>
<td>Module</td>
<td>Virology</td>
</tr>
</tbody>
</table>
1 The Vetsuisse Faculty University of Zurich

1.1 About the Vetsuisse Faculty

The Vetsuisse Faculty consists of 6 preclinical institutes, of 6 para clinical institutes and of the Department for Small Animals, the Department for Farm Animals and the Equine Department. Every year approx. 260 students are matriculated for the bachelor degree and 120 for the master degree. Additionally, approx. 250 PhD matriculated students work in scientific research within or outside the faculty (dissertation, postgraduate courses).

The University of Bern and the University of Zurich form the Vetsuisse Faculty. The Vetsuisse Faculty received accreditation from the EAEVE (European Association of Establishments for Veterinary Education) in 2011.

1.2 About the Veterinary Teaching Hospital

The Veterinary Teaching Hospital is both a teaching and referral hospital. It provides services to many parts of Switzerland and to neighboring countries.

The Faculty of Veterinary Medicine has three major focuses of research: Proteomics, Veterinary Preventive Medicine and, Radio-Oncology However, research is also performed in many others areas of life sciences (see → Zürich
2 UZH International

An international network and a strong regional base are set out as major priorities in the mission statement of the University of Zurich. In the interest of realizing these objectives, many forms of national and international cooperation have been created which promote the exchange of students, researchers and the teaching staff. The University of Zurich has established more than 330 cooperations in teaching and research with institutions in ca. 60 countries. The University of Zurich actively seeks to work with institutions that are interesting partners for UZH institutes and faculties.

2.1 International Relations Office University of Zurich

The International Relations Office of the UZH provides information and advice to students who are interested in an exchange program under http://www.int.uzh.ch. The Student Guide provides interesting information as well.

2.2 Campus life

Students are able to research information regarding the University of Zurich and its campus life over the website provided by the University: http://www.uzh.ch.

2.3 Socrates / Erasmus Program at the Vetsuisse Faculty

The Socrates / Erasmus Program offers veterinary students and academics the option for a one or two semester exchange program at one of its partner universities. The program supports students who choose to study at the Vetsuisse Faculty as well as students who choose to study at partner faculties.

http://www.vet.uzh.ch/Studium/vetmed/austauschprojekte.html

Two different programs for Students of the Socrates/Erasmus program are available:

2.3.1 Semester exchange program

The Students book modules of the 2nd, 3rd or 4th year of the program with or without accompanying examinations. Special rules exist for examinations (see Erasmus-Examinations). It needs to be checked previously with the Erasmus coordinator of the students Home University if the credits for examinations taken at the Vetsuisse Faculty University of Zurich will be taken into account. We proceed on the general assumption that credit can be given only for Examinations of the non-organ system modules and not for the organ system modules. However, each care is treated individually.

In order to commence the semester successfully, students need to take note of the starting dates for semesters at the UZH.
2.3.2 Clinical rotation program

A clinical rotation program according to the orders of the students’ home University can be worked out on condition that this specific clinical subject is available at the Zurich campus. Generally, the students are offered a 3-month program. Provided a place will be available, students may commence with practical studies at any time during the semester. Every academic year the Vetsuisse Faculty offers rotations to at least 4 students from partner universities. A larger number of students can be accepted in case if the place is available. Unfortunately, the number of clinical training positions is restricted by the capacity of the clinics. Hence, the Vetsuisse Faculty can accept only about 50% of applications for clinical training.

2.3.3 Socrates / Erasmus coordination

Specific questions in relation to the Erasmus Exchange Program can be addressed to Prof Dr Thomas Lutz (Email tomlutz@vetphys.uzh.ch), Erasmus Faculty Coordinator. Veterinary medicine students may also visit the Vetsuisse Faculty, University Zurich Website (www.vet.uzh.ch).

2.3.4 Learning agreement

It is important for foreign students coming to us as well as students intending to go abroad, to clarify the crediting of previous accomplishments. Crediting of accomplishments from other universities is complex.

When completing the learning agreement, the examination subjects to be taken in the host country must be stated after consultation with the Faculty coordinators of the Vetsuisse Faculty. Should there be no official examination for a particular subject, which the student can sit, and then if required, a so-called Erasmus examination may be arranged.

2.3.5 Application

Application is open to all students whose home university has a bilateral Erasmus agreement with the University of Zurich in the field of study in question. Students are selected by their home university which then submits the students' application materials to the International Relations Office at the University of Zurich.

Application deadline for the next full academic year (fall and spring semester) is 15 April. Further information about partners, tuition fees, application etc. can be found on http://www.int.uzh.ch/in/program/erasmus.html.
3 Admission of regular students

It is possible to study veterinary medicine either at the campus in Bern or Zurich. Foreign students will be offered a place of study only if all admission requirements according to the ordinance on the admission to study) are met (http://www.uzh.ch/studies/application/generalinformation/matriculation/vzs.pdf).

In order to be able to pursue a course of study in veterinary medicine, the applicants must submit an electronic registration until 15 February of the current academic year under the Internet address http://med.crus.ch. Regulations for foreign nationals (SUK, dated 12.10.2006) can be found under http://med.crus.ch or http://www.uzh.ch/studies/application/medicine.html.

Should applications exceed available study places, an aptitude test must be taken. The aptitude test has been imposed for the several years.

3.1 Compulsory matriculation for all students

Students will need to be matriculated at the University as long as services such as the attendance of lectures/courses and support and advisory services are claimed. This includes the use of libraries, collections and network services and attendance of examinations. The Student Administration is responsible for matriculation (admission@uzh.ch).

3.2 UZH Card

Students have to validate their student identity card at one of the validation terminals. Persons who claim services from the UZH will need to be able to show the identity student card on request. Whosoever will not comply with these regulations or will be found unable to identify himself/herself or his/her eligibility in order to obtain services will be excluded from the services and expelled from the campus.

3.3 Veterinary Medicine Association

The veterinary medicine association (http://www.vet.uzh.ch/Studium/fachverein.html) represents the interests of the students of the Vetsuisse Faculty towards the Faculty, University, towards each other and to the public. It promotes engagements in events of scientific, cultural nature and social. The veterinary medicine association further organizes the legendary veterinary hospital festivals.
4 Information regarding lectures

Information regarding academic years is updated on a regular base on the website of the Vetsuisse Faculty. Course guidance assistance is offered from the Office for Admission and Academic Services.

4.1 Lecture Halls

The location and lecture hall for relevant events can be found on the class schedule. The schedule is uploaded on the homepage of the faculty (http://www.vet.uzh.ch/Studium/studiengang/stundenplan.html).

The majority of the lectures of the first study year are held at the campus of the University Zurich-Irchel. The practical training in anatomy and physiology are held at the lecture halls of the Vetsuisse Faculty.
The lectures from the second until the fourth academic year are mostly held at the Vetsuisse Faculty and Veterinary Teaching Hospital.
Excursions will be published.

The fifth study year consists primarily of rotations in the clinics, institutes and departments. Each student’s timetable is individually scheduled.

4.2 Module booking

Since all compulsory modules are identical for all students, the booking of modules is handled by Admission and Academic Services. Erasmus exchange students do not need to book modules independently.

4.3 Study Material

Lecture notes are distributed directly by the lecturers, either at the beginning of each lecture, or during the lecture, or uploaded on the OLAT platform. Some materials can be purchased in the student shop (central department of the student body at the University Irchel).

Lab coats and overalls can be rented at the Vetsuisse Faculty.

4.4 Libraries and Resource Centres

Library of Vetsuisse Faculty
Main building, Winterthurerstrasse 260, http://www.vetbiblio.uzh.ch/
Opening hours: Monday to Friday, 8:30–20:00
Open-shelf library / lending library, work places, computer work places, connections for Laptops, WLAN, veterinary textbooks and learning software.
Veterinary Anatomy Collection
Next to Mensa. Opening hours: Monday to Friday, 7:00–17:00, Work places and some computer work places, places to work with a microscope, Anatomical and surgical preparations.

Study Library Irchel
Strickhofstrasse 35
http://www.hbz.uzh.ch
Reading rooms are open:
Monday to Friday, 8:00–20:00

4.5 E-Learning
You wish to use e-learning in your lectures, internships, seminars, etc.? At the University of Zurich, a large number of good e-learning tools are offered or proposed which will support you in the preparation of didactic meaningful e-learning content.

http://www.e-vetsuisse.uzh.ch/elearningmedia/medverz.html

This directory contains all the e-learning objects as OLAT courses, Casus cases, web applications, video, and desktop applications that were developed by project managers / authors of the Vetsuisse Faculty, and are used in the teaching.

4.6 Mailing lists
Important information will be forwarded to all students of the respective academic year (these lists are generated from the UniAccess-addresses). Information to mailing lists is available under:
www.vet.uzh.ch/Studium/vetmed/informatik/mailinglisten.html
The e-learning team is able to assist with all problems regarding mailing lists (e-learning of the Vetsuisse Faculty, elearning@vetadm.uzh.ch).

Assistance with problems with your UniAccess-account can be found under:
http://www.access.uzh.ch/hilfe or at the information centre, University Zurich-Irchel, room 01-F-95 (044 635 67 83; Mon-Fri 10.00am - 04.00pm).

4.7 Parking
Students are advised to travel via public transport. No parking spaces are available for students on the faculty campus of the Veterinary Hospital.
Parking cards for the car park of the University Zurich-Irchel can be purchased over the helpdesk of the University Zurich-Irchel. Parkcards are approx. 60.- CHF/month.
5 Assessments

The legal basis regarding the study of the bachelor and master study program at the Vetsuisse Faculty is specified in the study regulation (http://www.vet.uzh.ch/Studium/studiengang/pruefungen-1.html). Performance assessment and the composition and weighting of the performance assessments are described in the attachments of the study regulation.

The performance assessments are organized by the office for Admission and Academic Services. Admission and Academic Services handle information and enrolment as well. Performance assessments take place approximately 2 – 5 weeks after the term. Schedules are published at the beginning of the autumn term of each semester.

5.1 Guidelines for Erasmus Examinations

Erasmus examinations are examinations for Erasmus scholarship holders for accreditation of one or several associated learning units at the students’ home university. Usually the Erasmus students will discuss the type and choice of assessments with their home- and partner universities. The Vetsuisse Faculty anticipates the Erasmus students to participate in official examinations. However, after consultation, the lecturers are sometimes prepared to offer performance assessment individually tailored to the needs of Erasmus students.

5.1.1 Registration/Deregistration

The individual learning agreement states which examinations the student intends to complete.

The definitive registration form needs to be submitted in due time for the attention of the Erasmus coordinator. The Erasmus coordinator forwards the form to the Office for Admission and Academic Services. Admission and Academic Services notifies the relevant lecturer.

Registration deadline for examinations of the autumn semester is November 1, for the spring semester May 1. Late registrations cannot be considered.

http://www.vet.uzh.ch/Studium/vetmed/austauschprojekte.html

Deregistration needs to be addressed in writing to Admission and Academic Services. The Deans’ Office or the Erasmus coordinator will decide if reasons for deregistration are valid. A medical certificate needs to be presented in case of illness. Unexcused absence from examinations shall be deemed as failure.

5.1.2 Dates of examinations

Examinations take place in the regular examination sessions. With the approval of the lecturer and within timely registration, examinations can sometimes be taken orally.
5.1.3 Type of examination and content

The lecturer defines the nature of examinations. Tests will include the contents of a teaching unit for which credit points will be allocated. Assessment will be in accordance to study regulations. In case of sufficient score all the credit points will be accredited. No credit points will be given for insufficient performance.

5.1.4 Examination results

The lecturer communicates the results to the students as well as to Admission and Academic Services (within the dean’s office). The Dean’s office passes on the results to the Erasmus-Coordinator. The Erasmus-Coordinator forwards the result incl. contents of the module to the home university of the Erasmus student.

5.1.5 Repeating Options

Failed exams may be repeated twice. The type of re-examinations is defined in agreement with the Erasmus-Coordinator and Admission and Academic Services.

5.2 Transcript of records

After each semester the student receives a transcript of records stating acquired credit points and grades. The complete transcript is generally required for further study at foreign universities and should be kept carefully.

For successfully completed studies credit points in accordance with the European Credit Transfer and Accumulation System (ECTS) will be awarded. The modules shall be considered completed successfully if assessment of achievement will be no less than a grade 4.

Erasmus students generally receive transcript of issued directly by the Vetsuisse Faculty.

5.3 Grades

6 = excellent, 5 = good, 4 = satisfactory (pass level), 3 = unsatisfactory, 2 = poor, 1 = very poor
6 Maps

Irchel Campus

Lecture Halls Irchel
Vetsuisse campus
7 Semester Dates

Semester dates are published under [http://www.uzh.ch/studies/dates.html](http://www.uzh.ch/studies/dates.html). The lectures of the autumn semester usually start during calendar week 38 and the lectures of the spring semester usually in calendar week 8. The semesters have the duration of 14-15 weeks.

Practicals are offered all year round.
8 Bachelor and Master Study Program

8.1 Bachelor Program Veterinary Medicine

During the bachelor degree of Veterinary Medicine 180 credit points are obtained over three academic years.

The first academic year provides necessary basic skills and methods in physics, chemistry and general biology as well as a foundation in biomedicine and veterinary medicine for further academic years. Thereby basics of molecular and cellular as well as general morphological and functional principles in the organism in the topics/subjects anatomy, physiology, biochemistry and histology are acquired. Furthermore, students are encouraged to delve into aspects of animal welfare and scientifically founded studies in relation to animal husbandry. Exemplified by selected clinical cases students will become familiar with the principles of veterinary thinking.

The second and third academic years are divided into non-organ-centered (NOC) and integrated organ-centered (OC) tuition.

The non-organ-centered tuition comprises basic clinical studies as well as pre- and para clinical subjects which cannot be integrated into the organ systems. Non-organ-centered tuition comprises following subjects:

- General Surgery
- General Pathology
- General Pharmacology and Toxicology
- General Zoo technology
- Biochemistry and Molecular biology
- Immunology
- Bacteriology
- Parasitology
- Virology
- Propaedeutics. NOC-Subjects are partially integrated into organ system teaching sections where necessary

The following organ systems modules are offered in organ-centered (OC) teaching sections

- Organ systems module blood, immune system organs, laboratory medicine
- Organ systems module locomotor systems
- Organ systems module digestion, metabolism
- Organ systems module cardiovascular, respiration
- Organ systems module nephrology, salt-water-balance
- Organ systems module dermatology, thermoregulation
- Organ systems module CNS, sensory organs
- Organ systems module reproduction, mammary gland

The following targets apply in organ-centered teaching sections:

- Understand structure and function of organs as well as organ function
- Have the ability to describe an examination of the organ system
- Have the ability to explain morphological changes and organ dysfunction
- Have the ability to define important clinical manifestations
After successful completion of the Bachelor degree course, students will acquire the title ‘Bachelor of Veterinary Medicine’. The title grants admission to the Master program in Veterinary Medicine.

8.2 Master Program Veterinary Medicine

During the Master program of Veterinary Medicine 120 credit points will be acquired over 2 academic years.
The Master program is divided into core (= core curriculum) and specialized subjects (= focus curriculum).

The core curriculum taught during the first year of the Master comprises of a module in exotic pets, wildlife, zoo animals and fish as well as selected clinical subjects. Additionally, on the basis of leading symptoms (= chief complaints), diagnostic and therapeutic case studies are learnt.

In the chief complaint week (one chief complaint discussed per week), students work in small groups on cases (food animals, horses, small animals) and present them to the entire class during the final discussions.

The focus curricula are divided by topics and deal with issues of selected species or non-clinical disciplines. In lectures, labs and rounds the students learn how to assess and solve problems relating to individual animals, but also groups of animals.
Focus curricula are introduced by the responsible lecturers during the spring semester of the 3rd academic year. A student may choose between 2 subjects, but generally the students can take up first choice. In the first year of the Master students spends 9 weeks in the focus curriculum and in the 2nd year of the Master they spend approximately half of the rotations in the focus curriculum.

An individual program will be provided for students with a non-clinical focus curriculum.

Clinical focus curriculums are:
- companion animals
- horses
- farm animals

Non-clinical focus curriculums are:
- Biomedical research
- Pathobiology
- Veterinary Public Health (VPH)

The handling of patients and independent examination of animals are practiced in clinical exercises throughout the course of the master studies.
Night and emergency services are performed from the third academic year (Bachelor) onwards in both years of the master program. During the course of the 1st year in the Master, 2 credit points shall be awarded for the accomplishment of Night and emergency service.
At the beginning of the 1st year of the Master students choose the subject of their master thesis. The master thesis is written during the Master program.

During the course of the 2nd year of the Master, during so-called clinical rotations, practical application in all areas of veterinary medicine is learnt and trained. The training takes place the Vetsuisse Faculty’s own clinics and institutes. Additionally, two external four-week externships with veterinarians are part of the 2nd year of the Master. Writing the master thesis completes the fifth academic year with the title ‘Master of Veterinary Medicine’.

8.3 Swiss Federal Diploma

The Swiss Federal Diploma is acquired within four to five months after completion of the study program. The Swiss Federal Examination in Veterinary Medicine must be completed successfully according to the (new) Federal Law on Medical Professions, MedBG to practice veterinary medicine. Examination registration as well as execution is handled via the Swiss Federal Office of Public Health, BAG. Exam location is the Vetsuisse Faculty. The Swiss Federal Diploma entitles for practice in Switzerland. A person holding a Master in Vet Med but no Swiss Federal Diploma is not entitled to use the term ‘veterinarian’ (Tierarzt / Tierärztin) for his/her professional life. He/she is not allowed to practice veterinary medicine independently.
9 Overview of the Study Program

9.1 Course of Studies Bachelor of Veterinary Medicine (B Med Vet)

| 1. Academic Year | Foundations of Natural science relating to Veterinary Medicine, Introduction to Anatomy, Physiology, Histology, Biochemistry, Ethology, animal welfare | Examinations |
| 2. Academic Year | non-organ centered and integrated organ centered tuition | Examinations |
| 3. Academic Year | | Examinations |
| 180 Credit Points: Granting of Bachelor of Veterinary Medicine |

9.2 Course of Studies Master of Veterinary Medicine (M Med Vet)

| 1. Academic Year | Chief complaints, clinical subjects, (core) tuition, commencement of master thesis, focus curriculum | Examinations |
| 2. Academic Year | Rotation in clinics, institutes and departments, External practicals, Writing of the master thesis | Passing of rotation and external internship and accepted master thesis |
| 120 credit points: Granting of Master of Veterinary Medicine |

Federal examination Veterinary Medicine in accordance with MedBG
Practical examinations in subjects: small animals, horses, domestic animals and pathology.
## Autumn term

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<th>Teaching unit</th>
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## Spring term

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4 days
## 11 Detailed Overview Lectures (Bachelor): 3rd Academic Year

### Autumn term

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12 Detailed Overview Lectures (Master): 4th Academic Year

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### Spring term

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</table>

e excl. 1 week Easter (vacation)
13 Detailed Overview Master 2nd Academic Year

Description in Chapter 17.2
14 Postgraduate student education

The academic track includes mainly Postgraduate Dr. med. vet. and PhD programs.

Dr. med. vet.: This degree can be obtained following one to two years of research work, usually in a university institute or clinic, leading to a doctoral dissertation. Many graduates opt for the Dr. med. vet. because the doctoral title has a long tradition. The doctoral students have a supervisor (faculty member) who supplies the topic, resources and guidance.

In general, admission procedures to the Dr. med. vet. program do not discriminate between local and foreign students. For students involved in the Dr. med. vet. program, the typical procedure is that open positions are posted locally at the Vetsuisse Faculty and electronically via the institutes’ or university’s homepages. Students apply for these positions and admission depends on the direct interaction between supervisor and candidate.

PhD: Students participate in various PhD programs offered at the Universities of Zurich and Bern. In Zurich, most PhD students are enrolled in the Life Science Zurich Graduate School, but a number of students, mainly but not exclusively from clinical disciplines, are enrolled in the Graduate School University of Bern. The table below lists all students in Zurich doing the respective degree, irrespective of the program that they are enrolled in.
15 Lectures at the Vetsuisse Faculty

The UZH publishes the list of lectures online under

Up-to-date study guides of individual academic years are published on the faculty’s own website.

15.1 Timetable

Timetables are published under http://www.vet.uzh.ch/Studium/studiengang/stundenplan.html.

The timetable indicates to which module the appropriate lecture belongs. Lectures do not receive further descriptions; exception is teleteaching, marked with TT.

Teleteaching takes place either in Bern or Zurich and is electronically transmitted to the other location. The TT-lecture-room (35-F-51) is located at the Irchel campus. Only 3 minutes walking distance from the Vetsuisse faculty.

Abbreviations in the timetable
P = Practical
U = Exercise
K = Colloquium
TT = Teleteaching

15.2 Language Proficiency

The language of instruction is German. Few lectures are taught in English. Written examinations are in German.

For incoming students, a three-week, intensive German course is offered twice yearly, four weeks prior to the commencement of lectures. This course, however, is not suitable for beginners; a basic knowledge of German is required. Registration is not required, and there is no fee. This course is highly recommended for all incoming students of the SOCRATES / ERASMUS program whose native language is not German. It not only serves to improve German language skills, but it also provides insight into daily Swiss life.

In addition to this intensive course, other free German courses (intermediate and advanced levels) are offered during the semester. For further information: http://www.sprachenzentrum.uzh.ch
15.3 Challenges for Erasmus Students

While booking lectures, Erasmus students might face the following challenges/problems:

Parasitology II (3rd academic year) takes place during the autumn term, Parasitology I (2nd academic year) during the spring term. Due to the fact that the NOC day of the 2nd and 3rd academic year is always held on a Monday, Erasmus students, who complete several NOC modules, may experience overlaps in the timetable. Erasmus students who complete special pathology must attend pathology lectures within the organ systems modules.
16 Term program of the Bachelor Degree

Numbers of hours vary minimally from year to year. Preparation and post processing times are not mentioned.

The student work can also be described in the amount of credit points (CP) related to the module. An examination usually consists of several modules. The regular students earn CP only when they successfully complete the package of modules.

16.1 1st Academic Year

### Autumn term

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<td>General Physiology</td>
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<td>General Physiology</td>
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### Spring term

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### 16.3 3rd Academic Year

#### Autumn term

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<th>Hours</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Studies</td>
<td>Professional Studies I</td>
<td>Lecture, Excursion</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Parasitology</td>
<td>Parasitology II</td>
<td>Lecture, Exercises</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Veterinary Public Health (VPH)</td>
<td>Fundamentals of Food Hygiene</td>
<td>Lecture, Excursion</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Virology</td>
<td>Virology I</td>
<td>Lecture</td>
<td>28</td>
<td>see spring term</td>
</tr>
<tr>
<td>Organ system module Cardiovascular, respiration</td>
<td>Organ system module cardiovascular, respiration</td>
<td>Lecture, Practical</td>
<td>158</td>
<td>13</td>
</tr>
<tr>
<td>Organ system module nephrology, salt-water-balance</td>
<td>Organ system module nephrology, salt-water-balance</td>
<td>Lecture, Practical</td>
<td>74</td>
<td>7</td>
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</table>

#### Spring term

<table>
<thead>
<tr>
<th>Module</th>
<th>Teaching Unit</th>
<th>Type</th>
<th>Hours</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propaedeutic</td>
<td>Propaedeutic II</td>
<td>Practical</td>
<td>23</td>
<td>2</td>
</tr>
<tr>
<td>Veterinary Public Health (VPH)</td>
<td>Clinical Epidemiology</td>
<td>Lecture</td>
<td>23</td>
<td>2</td>
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<tr>
<td>Virology</td>
<td>Virology II</td>
<td>Lecture</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Organ system module Reproduction, Mammary Gland</td>
<td>Organ system module Reproduction, Mammary Gland</td>
<td>Lecture, Practical</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>Organ system module Dermatology, Thermoregulation</td>
<td>Organ system module Dermatology, Thermoregulation</td>
<td>Lecture, Practical</td>
<td>46</td>
<td>3</td>
</tr>
<tr>
<td>Organ system module CNS, sensory organs</td>
<td>Organ system module CNS, sensory organs</td>
<td>Lecture, Practical</td>
<td>108</td>
<td>9</td>
</tr>
</tbody>
</table>
17 Term program of the Master Degree

17.1 1st Academic Year

Autumn term

<table>
<thead>
<tr>
<th>Module</th>
<th>Teaching Unit</th>
<th>Type</th>
<th>Hours</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical subjects</td>
<td>Anaesthesiology (general and specific)</td>
<td>Lecture, Demonstration</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Swine medicine</td>
<td>Lecture, Colloquium</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Endocrinology</td>
<td>Lecture</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evidence based complementary medicine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oncology</td>
<td>Lecture, Colloquium</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles of obstetrics and neonatology</td>
<td>Lecture, Practical</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exotic pets, wildlife, zoo animals and fish</td>
<td>Lecture, Colloquium</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical laboratory diagnostics</td>
<td>Lecture</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical toxicology and residue toxidology</td>
<td>Lecture</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shock</td>
<td>Lecture</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infectious diseases in ruminants</td>
<td>Lecture</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical Practice, course in</td>
<td>Practical</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internal medicine, surgery, reproduction in all relevant species</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paraclinical Subjects</td>
<td>Immunoinfectiology</td>
<td>Lecture, Colloquium</td>
<td>38</td>
<td>see spring term</td>
</tr>
<tr>
<td></td>
<td>Immunoprophylaxis</td>
<td>Lecture</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Practice management</td>
<td>Veterinary legislation</td>
<td>Lecture</td>
<td>6</td>
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<tr>
<td>VPH II</td>
<td>Epizootic disease control</td>
<td></td>
<td>45</td>
<td>5</td>
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<tr>
<td></td>
<td>Animal welfare law</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Veterinary Pharmacy Practice</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Chief Complaints</td>
<td>Chief Complaint Cough/Dyspnea</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td>see spring term</td>
</tr>
<tr>
<td></td>
<td>Chief Complaint Infertility</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chief Complaint Diarrhea/Vomiting</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
**Spring term**

<table>
<thead>
<tr>
<th>Module</th>
<th>Teaching Unit</th>
<th>Type</th>
<th>Hours</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus curriculum (choice out of 6 subjects)</td>
<td>Focus „Small Animals“</td>
<td>Lecture, Colloquium, Practical, Excursions, etc.</td>
<td>about 60-100</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Focus „Farm Animals“</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Focus „Horse“</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Focus „Biomedical Research“</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Focus „Pathobiology“</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Focus „Veterinary Public Health“</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>Chief Complaint Weakness, Fits</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>Polyuria/Polydipsia</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>Lameness, Ataxia</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>Acute Abdomen</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Chief Complaint</td>
<td>Pruritus/Alopecia</td>
<td>Lecture, Colloquium</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Paraclinical Subjects</td>
<td>Necropsy</td>
<td>Lecture, Practical</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**17.2 2nd Academic Year, Clinical rotation program**

In the 2nd year of the Master program, students will undergo a rotation among the various clinics and institutes of the Vetsuisse Faculty. Half of the time will be spent in the subjects of the core curriculum and the rest in the subjects of the focus curriculum. Furthermore, students must complete a 4-week externship in a veterinary practice or clinic not associated with an university and a 4-week externship in a veterinary workfield associated with the selected focus. The students must also complete the master thesis.

For incoming exchange students a clinical rotation program according to the orders of the students’ home University can be worked out on condition that this specific clinical subject is available at the Zurich campus. Generally, the students are offered a 3-month program. Provided, a place will be available.

Exchange students may commence with practical studies anytime during the semester according to the individual program. The coordination depends on the available capacity the clinical rotations. They are welcome to most rotations.

Emergency medicine and clinical duty is compulsory for Erasmus students. There are instruction manuals in German. Nonetheless a visit before the actual service is essential.
## Term program of the Master Degree Study Guide Veterinary Medicine

**Year-round operating**

<table>
<thead>
<tr>
<th>Module</th>
<th>One week rotations</th>
<th>Erasmus students accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rotations in the core curriculum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulatory Service and Herd Health</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Small Animal Surgery</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Ruminant Surgery</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Equine Surgery</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Small Animal Internal Medicine</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Ruminant Medicine</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Equine Medicine</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Emergency medicine and clinical duty in small animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Emergency medicine and clinical duty in horses and farm animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Pathology</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Laboratory Medicine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Externship</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>Rotations in the focus curriculum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anesthesiology in Small Animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Anesthesiology in Horses</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Imaging in Small Animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Imaging in Horses</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Dermatology in Small Animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Reproduction in Small Animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Reproduction in Farm Animals</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Cardiology in Small Animals</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Oncology in Small Animals</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Experimental work in Biomedical Research</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Practical work in Pathobiology</td>
<td>No</td>
<td></td>
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<tr>
<td>Practical work in VPH</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Pig Medicine</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>VPH (Food Safety and Hygiene)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Zoo Animals, Exotic Pets</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Externship</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
18 Study Guide Bachelor Degree

Typically in all teaching units the lecturers and references to the literature will be published in the University Calendar (also online). Further references and literature recommendations are usually supplied during the lecture.

Lecture Notes are made available over the e-learning (electronic learning) environment OLAT. Further or additional data will be mentioned during lectures.

<table>
<thead>
<tr>
<th>Module</th>
<th>General Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Unit</td>
<td>General Surgery</td>
</tr>
</tbody>
</table>

**Lecturers**
A. Fürst et al.

**Introduction**
Introduction to fundamentals and basic principles of surgery, that permits state-of-the-art (lege artis) surgery.

**Objectives**
- Introduction to fundamentals and fundamental principles of surgery
- Preparation of patients for surgery
- Knowledge of basic rules and behavior in the operating room
- Knowledge of operating instruments
- Knowledge and practical application of seam techniques and simple skin seams

**Lecture Notes**
Small Animal Surgery: Comprehensive abstract over OLAT with 2-4 article references. Manuscript with important slides and photos shall be delivered.

**Self-check questions**
The lecturers of the large animal surgery will make 2 self-check questions per lecture available and provide these within a given time.
Introduction
In this module you will become acquainted with the structures and functions of the cells and the four tissue types (epithelia, connective tissue, musculature, nervous tissue). Preliminary the technique of microscopy shall be described. This module lays the foundation for understanding the structure and function of the whole organism (basic anatomy and physiology) and serves as preparation for the organ-centered teaching in 2nd and 3rd study year.

Objectives
– Illustrate different types of contrast theory (s-w-contrast, color contrast, interference contrast, phase-contrast, fluorescence microscopy, confocal microscopy)
– Illustrate the structure and function of the cell
– Illustrate Structure and functions of the 4 tissue types (epithelia, connective tissue, muscle and nerve tissue)
– Osteology: Illustrate the construction, development and construction of the bone
– Illustrate structure, function and systematics of the glands
– Deduce the origin of the 4 tissue types (possibly as repetition of developmental biology)
– Perform determination of size of objects in microscopic preparations
– Recognize cells in light microscopic section
– Recognize the 4 types of tissue in special stains and HE stains in light microscopic section
– Recognize and differentiate ubiquitous structures (vessels and nerves) in special stains and HE stains in light microscopic sections
– Describe preparation techniques and applicability of light microscopy and other microscopic techniques
– Describe microscopy techniques and applicability other than routine light microscopy
– Illustrate basic functions of the epithelia (absorption, resorption and secretion)
– Illustrate function of the muscles at the cellular level
– Illustrate important aspects of muscle metabolism
– Illustrate differences between smooth muscle, cardiac muscle and striated muscle
– Illustrate electrophysiological bases of neural activity
– Illustrate functions of the vascular endothelium

Electronic teaching aids
CLIVE-learning programs in the library of the Vetsuisse Faculty. Histology specimens and additional associated information on Scanscope-Platform and on OLAT

Self-test questions
Identification of structures using images (computer or paper) colloquium, presentations Microscopy conferences with student tutors
Module  General Pathology
Teaching Unit  General Pathology I

Lecturer  
A. Pospischil

Introduction  
In General Pathology Module I you will become familiar with basic mechanisms of development of disease at the level of the cell, organ and whole organism.

These mechanisms are mainly by morphological and functional changes of cell, organ and organism and shown histologically, electron microscopically and macroscopically and linked with the molecular or biochemical processes.

The practical serves detailed discussion of typical, individual morphological changes, which shall be of importance later in the curriculum (organ system modules and rotations during the 5th study year).

Aim of the event/practical is to convey an understanding of medical contexts and thus to facilitate subsequent diagnostic, therapeutic and prophylactic activities.

Electronic Teaching Aids  
OLAT: Course ‘General Pathology for Veterinary Surgeons’ – lecture accompanying course (lecture accompanying self-study)’, individual case studies to general pathology  
OLAT: Case studies to general pathology.  
Swiss virtual animal pathology: http://www.animalpatho.org  
Histopathological preparations are available in the training room. Electronical version (incl. podcast of the descriptions of the histopathological preparations): OLAT course Vet: Histo. General pathology preparations.

Self-test questions  
OLAT sample test at the beginning of the spring term (separate invitation will be sent in time)

Teaching Unit  General Pathology II

Lecturers  
A. Pospischil, F. Guscetti, N. Borel

Introduction  
In General Pathology module II you shall become familiar with basic mechanisms of development of disease at cell, organ and whole organism level. These mechanisms are mainly explained by morphological and functional changes of cell, organ and illustrated histologically, electron microscopically and macroscopically organism and linked to the molecular or biochemical processes.
The practical provides detailed discussion of individual typical morphological changes and will be of importance later in the curriculum during the 5th study year for organ system modules and rotations. The events aim to convey an understanding of medical correlations/links and thus to facilitate subsequent diagnostic, therapeutic and prophylactic activities.

**Electronic Teaching Aids**
OLAT: Course ‘General Pathology for Veterinary Surgeons’ – lecture accompanying course (lecture accompanying self-study), individual case studies to general pathology OLAT: Case studies to general pathology.
Swiss virtual animal pathology: http://www.animalpatho.org
Histopathological preparations are available in the training room. Electronical version (incl. podcast of the descriptions of the histopathological preparations): OLAT course Vet: Histo. General pathology preparations.

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**Module**  General Pharmacology and Toxicology

**Teaching Unit**  General Pharmacology and Toxicology

**Lecturer**  F. Althaus et al.

**Introduction**
In this module you will become familiar with basics of pharmacology and toxicology. It is our aim to get you acquainted with pharmacological and toxicological approaches to thinking, which will subsequently enable you to independently solve therapeutic problems or poisoning cases. In this module you will also need to learn to handle our computer-assisted drug and poison information system, as well as to know where you can obtain relevant information.

**Objectives**
- Know and apply basics/basic guidelines of the pharmaco-and toxicodynamics
- Basic understanding of the mechanisms of the most important side effects of drugs such as allergies, dependency, idiosyncrasies, interactions, polymorphisms, etc.
- Basic knowledge of the pharmacological effect on the vegetative nervous system
- Basic knowledge of the antimicrobial substances, effective mechanisms and types of application.

**Electronic Teaching Aids**
Electronic compendium of veterinary medicinal products and drugs of the Institute of Veterinary Pharmacology and –Toxicology, Zurich, under www.tierarzneimittel.ch
‘CliniPharm/CliniTox’: Drug and poison information system at the Institute for Veterinary Pharmacology and Toxicology in Zurich under www.clinitox.ch

**Lecture notes**
All under www.vetpharm.uzh.ch/ger_g/script.htm
Althaus, F.R., Demuth, D., Mevissen, M., Müntener, C.R. & Naegeli, H. Fundamentals of Pharmacology and Toxicology: Pharmacokinetics, Pharmacodynamics–UAWs
Althaus, F.R., Mevissen, M., Müntener, C.R. & Naegeli, H. Special Pharmacology (Vegetative NS)
Althaus, F.R., Mevissen, M., Müntener, C.R. & Naegeli, H. Antimicrobial Substances

Self-test questions
Access on www.vetpharm.uzh.ch/cyberpharm

Module General Zootechnics
Teaching Unit General Animal Nutrition

Lecturer
To be defined

Introduction
In this lecture you will learn basics of animal nutrition. Starting with the experiment of digestion, parameters such as digestible crude protein, absorbable protein, digestible and metabolizable energy and net energy for lactation and growth are being introduced. Animal performance shall be generally discussed also and illustrated how it can be influenced by additives such as enzymes and probiotics. Prerequisite for this lecture is basic knowledge of feedingstuffs and nutrition physiology.

Objectives
– You have knowledge of digestible raw nutrients.
– You are familiar with the parameters, which define requirements of energy, protein and minerals of individual species.
– You are able to interpret a C-N balance.
– You know how animal performance is specified and how it can be influenced by food additives.

Self-test questions
Written questions are provided at the end of each chapter. If desired, these will be discussed during the lectures.

Teaching Unit Specific Animal Nutrition

Lecturer
To be defined

Introduction
You will obtain knowledge of energy and nutrient requirements of livestock and pets during different stages of performance, respectively life phases and know how these needs can be met with species-appropriate feedstuffs. Detailed feeding errors which may be cause of disease will be thereby discussed in particular. Exercises will familiarize you with standards and nutritional value tables. Prerequisites for this lecture are knowledge of feedingstuffs and basics of animal nutrition (Lecture general animal nutrition).
Objectives
– Knowledge of energy and nutritional requirements of cattle, pigs, horses, dogs and cats during various life stages, depending on performance.
– Familiarity with required standards and nutritional value tables for the formulation of species-appropriate rations.
– Knowledge of feeding errors, which may cause disease.

Self-test questions
Written questions will be handed in at the end of each lecture and discussed at the beginning of the following lecture.

Learning Recommendation
It is recommended to work through the delivered questionnaires during the week and to actively participate in the exercises.

Teaching Unit: Animal Feed Science

Lecturer
To be defined

Introduction
In this course you will learn about ingredients and nutritional value of feedingstuffs. You will also learn which feedingstuffs are suited for which species. This knowledge shall be required and applied in following lectures: ‘General animal nutrition and nutrition of different species’.

Objectives
– Identify the most important food crops and feedingstuffs
– Know how fodder plants are harvested, preserved, stored and processed
– Knowledge of food waste manufacturing of by-products that can be used in animal nutrition
– Knowledge of components and quality properties of feedingstuffs
– Knowledge of exogenic factors which affect the quality of feedingstuffs
– Knowledge of the feedingstuffs legislation

Electronic Teaching Aids
eFeed. The course will/shall be offered over the teaching platform OLAT. The eFeed program will/shall be introduced during the lecture. Elaboration of learning contents with eFeed can replace the visit of the lectures!

Self-test questions
Self-test questions are part of the electronic teaching program eFeed.

Learning Recommendation
We recommend that you both attend the lectures and regularly work through the test questions in eFeed. You may also obtain the knowledge through eFeed alone. Regardless of how you acquire knowledge, search to identify for featured food plants on meadows and fields.
Teaching Unit  Animal Husbandry

Lecturer
C. Schelling

Introduction
The lecture intends to provide a basis for understanding (animal) breeders’ way of thinking, and their strategies. After discussing domestication of wild animal species and breeding in domestic animals, basics (genetic polymorphisms) and conditions (variation and genetics of qualitative and quantitative traits) shall be explained in order to be able to apply the two central elements of animal breeding (selection and breeding method) effectively in domestic animal populations. Difficulties regarding implementation of breeding strategies for veterinary medicine and animal husbandry as well as equally important tasks such as the fight against genetic diseases shall be discussed using the example of breed dogs. Finally, the importance of veterinary practice in relation to forensic issues (paternity testing and biological trace material) judicial and non-judicial nature shall be explained.

Objectives
– To understand domestication of wild species
– To know and define terminology of species and breeds of the most important pets
– To define and explain terms used in animal breeding
– To understand variation and heredity of qualitative and quantitative characteristics
– To explain linear definition and classification of breeding animals (genetic evaluation)
– To understand different selection and breeding methods
– Describe and evaluate potential and limitations of other breeding actions
– To understand the role of the veterinarian in relation to with forsenic investigations

Electronic Teaching Aids
The lecture is available in the form of PowerPoint presentations on OLAT Learning objectives will be defined for each lecture and questions submitted.

Module  Bacteriology

Teaching Unit  Bacteriology I

Lecturers
M. Wittenbrink

Introduction
During its first part in a total of 17 hours of lectures, the course places the emphasis teaching the fundamentals of infection, general bacteriology incl. laboratory diagnostics and prevention as well as veterinary mycology. Then, during 12 hours of lectures on clinical bacteriology veterinary medicine relevant gram-positive bacteria shall be treated.
Objectives
– To be able to illustrate fundamental concepts of infectious diseases and epidemic theory
– To be able to illustrate fundamentals of the structure and function of bacteria
– To be able to illustrate fundamentals of the pathogenicity of bacteria
– To be able to illustrate the foundations of bacteriological diagnostics.
– To be able to illustrate the terms disinfection and sterilization as well as important disinfection and sterilization procedures
– To be able to illustrate sensitivity and resistance of bacteria to antimicrobial chemotherapeutic agents (antibiotics) and the problem of antibiotic resistance in veterinary medicine
– To be able to classify of antibacterial substances and their action mechanism
– To be able to illustrate foundations of vaccination and passive immunization against bacterial diseases of animals

Objectives Mycology
– To be able to illustrate the diversity of fungi and their important key/commercial and harmful effects
– To be able to illustrate medically important structures and functions of fungi, including fundamentals of pathogenicity
– To be able to illustrate the laboratory diagnostics of the fungi
– Illustrate medically important secondary metabolites of fungi (antibiotics, mycotoxins)
– Explain diseases caused by fungi: fungal infection, mycotoxicosis, mykogène allergy, mykotisation, myzetismus
– Illustrate the effect the of the veterinary medically important antifungal chemotherapy

Objectives Clinical Bacteriology
– Illustrate veterinary medically important gram-positive pathogens, the etiological significance/relevance, pathogenesis, progression, diagnosis, control and prevention of diseases in animals and significance to human health.

Self-test questions
Are specified in the accompanying lecture scripts

Teaching Unit   Bacteriology II

Lecturers
M. Wittenbrink

Introduction
On basis of the lecture ‘Bacteriology I’ and with emphasis on clinical bacteriology, veterinary medically relevant gram-negative bacteria and fungi shall be discussed.
Objectives
Illustrate veterinary medically important gram-negative bacteria and fungi, the etiological significance, pathogenesis, progression, diagnosis, control and prevention of diseases in animals and significance to human health.

Self-test questions
Are specified in the accompanying lecture scripts

Module Occupational Studies
Teaching Unit Occupational Studies

Lecturers
External and internal veterinarians

Introduction
Lectures related to occupational studies take place during the fall and spring semester of the 3rd academic year. The focus will be is on veterinary medicine legal studies.

Teaching approach
Lectures, field trips, workshops

Goals
Short-term goal: Selection of major subject
Long-term goal: first place of work

Focus curriculums are introduced by the responsible lecturers during the spring semester of the 3rd academic year. Registration for focus curriculum (1st choice and 2nd selection) is expected to be scheduled between 15 March to 31 May. It will become clear towards the end of July whether the first choice of major may be taken up.

Module Musculoskeletal System Integrated
Teaching Unit Musculoskeletal System Integrated

Lecturer
H. Augsburger, A. Boos, T. Lutz, M. Gassmann, M. Weishaupt et al.
Introduction
In this module you shall be introduced to the passive (bones, joints) and active (muscles) parts of the musculoskeletal system. The module incorporates the subjects anatomy, physiology and radiology. It provides the basis for organ system module motion apparatus in 2nd academic year. This takes place on specimens and the living animal as well as through basic knowledge of radiographic anatomy of the musculoskeletal system.

Objectives
– To locate and identify bone, palpable bony landmarks, joints, muscles or clinically important muscle groups, tendons and tendon sheaths on the preparation, on living animals and drawings
– Illustrate/explain function of muscle groups and their role in biomechanics
– Name and describe origin, insertion and functions of important muscles
– Name and specify bones and direction of the beam path on X-ray images of isolated bone
– Locate, name and explain clinically relevant bone points, in particular insertion of ligaments, muscles and tendons and their functions on X-ray images
– Locate and name complicated joints of the joint gaps/articulated columns on X-ray images
– Illustrate, using an example, the clinical relevance of the various epiphyses of the bones
– Locate different sections of the spine and the intervertebral discs on X-ray images
– Locate, name and explain parts of the joints and their function
– Illustrate the general structure of bones, joints, incl. types of joints, muscles, tendons and tendon sheaths
– Classify types of joints
– Explain mechanical characteristics of muscles
– Explain the characteristics of different fiber types of muscle
– Describe forms of skeletal muscle contractions
– Illustrate structure and function of spinal reflexes on clinically relevant examples

Electronic Teaching Aids
CLIVE learning programs, in the library of the Vetsuisse Faculty.

Module Biochemistry I

Lecturers
U. Hübscher et al.

Introduction
In the teaching units macromolecules, enzymes, membranes / polysaccharides / lipids, general molecular biology and vitamins you will learn the most important basic principles relevant and important to the understanding of physiological (normal) and pathological (disease-causing) mechanisms in the animal body.

Learning Recommendation
We recommend you read the scripts before the lecture in order to strengthen your knowledge for post-processing. The lectures teach basics of fundamental biomedical subjects. You shall acquire sufficient knowledge in order to critically understand biological relationships in the overall organism. We will also orientate on possibilities to work in the lab (during your studies).

Teaching Unit: General Molecular Biology

Objectives
- Understand and know key doctrine of molecular biology and its relevance to all life forms on earth.
- Name and describe different types and structures of nucleic acids and to know their function
- Illustrate mechanisms of DNA, RNA and the synthesis of proteins
- Know and explain principles of prokaryotic and eukaryotic gene regulation
- Illustrate the latest developments in molecular biology (genomics, transcriptomics, proteomics and systems biology), describe and illustrate their significance for modern diagnostics

Teaching Unit: Enzymes

Objectives
- Define the term ‘International unit’ for enzyme activity (U)
- Define and explain the term "enzyme" the principles of enzyme action and enzyme kinetics
- Explain principles of clinical enzyme diagnostics, interpret laboratory results of case studies
- Illustrate enzyme inhibition as a action mechanism of drugs
- Describe regulatory and non-regulatory enzymes

Teaching Unit: Fat-soluble Vitamins

Objectives
- Classify vitamins
- Name and explain properties of the various vitamins in the form of foodstuffs and medicines (stability, solubility, etc.)
- Fat-soluble vitamins: Illustrate hormonal effects on the body and the effects of over-and under-dosing
- Vitamins: Illustrate occurrence in feedingstuffs, mechanisms of absorption and excretion and influences of clinical disorders to the vitamin metabolism
Teaching Unit | Macromolecules
---|---
**Objectives**
- Describe the structure of major macromolecules important in biology

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Teaching Unit | Membranes/Lipids/Polysaccharides
---|---
**Objectives**
- Illustrate biosynthesis, structure, properties and functions of biological membranes and describe and their importance for biological processes

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Module | Biochemistry II
---|---
Teaching Unit | Intermediary Metabolism

**Introduction**
The intermediary metabolism shows how the animal organism can gain energy, build and mobilize reserves. The main metabolic pathways shall be demonstrated. At the end of the course shall be elaborated how the metabolic regulation can take place, using three examples of allostery, hormones and the central nervous system.

**Objectives**
- Present an overview of the four pillars of intermediary metabolism
- Classify individual metabolic steps throughout the entire metabolism
- Illustrate the anabolic and catabolic pathways and regulation of the 4 substance groups; carbohydrates, lipids, proteins and nucleic
- Explain selected mechanisms and disease patterns/clinical pictures based on disorders of intermediary metabolism in animals
- Derive the reaction of the intermediary metabolism to physiological stimuli on the basis of regulatory mechanisms
- Assign metabolic action to the different bodies, organs and cell compartments
- Understand regulation at the level of energy supply (ATP) in detail
- Explain lactation ketosis, pregnancy ketosis and hunger ketosis on a biochemical level

**Electronic Teaching Aids**
A learning CD shall be provided together with the script at the beginning of the lecture
**Teaching Unit**  
**Water-soluble vitamins**

**Introduction**  
Water-soluble vitamins play a central role in the intermediary metabolism. On the basis of the beforehand in detail worked out/intermediary metabolism, major locations of vitamin effects are learnt.

**Objectives**  
– Explain the nine water-soluble vitamins and their functions in the metabolism  
– Explain key locations of action in the intermediary metabolism  
– Deficiency of the nine water-soluble vitamins  
– Recognize clinical symptoms in various animal species  
– Folacin: Understand principles of a tumor therapy  
– Apprehend biotin as an important reagent in diagnostics

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**Teaching Unit**  
**Special Molecular Biology**

**Lecturer**  
M. Hottiger

**Introduction**  
The Trainee veterinarians are to familiarize with the relevance of genetic engineering for use in veterinary medicine. The students also need to know currently applications. For this purpose basic knowledge in molecular biology, as required by medical personnel, is taught.

**Objectives**  
– Explain signal transmission pathways  
– Explain and illustrate the development of cancer  
– Describe and explain the diversity of antibodies  
– Illustrate major genetic engineering methods techniques  
– Describe legislation on genetic engineering  
– Describe Genomics and Proteomics

**Self-test questions**  
Self-test questions are provided in the electronic learning environment OLAT.

**Learning Recommendation**  
We recommend that you study the script before the lecture and recess in the follow-up.
Module  Biology I

Teaching Unit  Developmental Biology

Lecturers
M. P. Kowalewski, M. Gassmann

Introduction
During the first part, fundamentals of the development of sperm (spermatogenesis) and eggs (oogenesis), their union (fertilization) and subsequent cell division are taught. The development of basic, nutritional concepts are explained. It deals with the development of the germ layers (gastrulation) and the primitive formations (primitive groove, primitive node, head process). The system of primitive organs (notochord, neural tube, primitive gut, somites and lateral plates as well as the folding of the embryo) will be addressed and explained. The second part deals with the development and function of the placental membranes (chorion, amnion, allantois, yolk sac), as well as with the implantation (nidation) of the embryo and the formation of the placenta. Various types of placenta with the animal species characteristics and consequences resulting therefrom in the birth process are discussed. Furthermore, the development of the gill arches and the pharyngeal gill or intestine (branchial apparatus) and the resulting organs will be discussed.

Objectives
- To explain fundamental traits of the development of sperm and ova
- Describe the fertilization process, segmentation and cell division and know basic terms of developmental physiology
- Explain the formation of the germ layers and primitive formations and the investment of notochord, neural tube, somites and side plates (Somato-and Splanchnopleura)
- Describe the development of amnion, yolk sac and primitive gut in connection with the folding of the embryo
- Explain the development of the allantois and its importance for the formation of the placenta and the function of the remaining placental membranes
- Illustrate implantation and general formation of the placenta
- Classify and describe placentas and species type characteristics as well as to derive consequences for the birth process
- Explain the development of gill arches and the pharyngeal pouches and sketch the emerging tissue, respectively organs

Self-study
Sections of the gonads as well as uterus and placenta on the Scanscope Platform
Teaching Unit: Classical Genetics

Lecturer
C. Schelling

Introduction
The aim of the lecture ‘Classical genetics’ is to acquire foundations of genetics (or to refresh) in order to later apply this knowledge into important areas of veterinary medicine.

Objectives
- Understand the principle of transfer of genetic information
- Explain (the three) Mendel's laws
- Know characteristics and expansions/increments to Mendelian genetics
- Know DNA and chromosomes as carriers of genetic information
- Understand the importance of mutations
- Describe changes in allele frequencies in populations
- Understand sexual development in mammals

Electronic Teaching Aids
The lecture is available as Power Point presentation:
https://www.zbinwagrl.ethz.ch/
(Persons – Claude Schelling)

Teaching Unit: Cell Biology

Lecturer
M. Hottiger

Introduction
In the six teaching units cell biology, macromolecules, enzymes, membranes / polysaccharides / lipids, general molecular biology and vitamins you will learn about basic principles, which are of importance for an understanding of physiological (regular) and pathological (disease-causing) mechanisms in the animal body.

Objectives
- Describe the most important cell biological methods (techniques)
- Describe the structure of organelles of a cell and explain their function
- Proteinsynthese und Proteinsorting beschreiben und erklären
- Describe and explain protein synthesis and protein sorting
- Describe and explain cell division and cell proliferation: cell cycle, cell cycle phases and their control
- Explain cell interactions and cell differentiation

Electronic Teaching Aids
Questions on individual lectures on OLAT.
Self-test Questions
Self-test questions are available in the electronic learning environment OLAT.

Learning Recommendation
We recommend that you study the script before the lecture and recess in the follow-up.

Teaching Unit	Biodiversity Vertebrates

Lecturer
M. Sanchez

Introduction
Introduction to diversity and evolution of vertebrates. The diversity of vertebrates of all classes is/will be presented. Thoughts on evolutionary theory processes which may have led to this diversity are at the forefront.

Objectives
– To get to know the diversity of vertebrate animals
– To understand how this diversity may have developed
– To know evolutionary theory processes and patterns in the evolution of vertebrates

Module	Biology II

Teaching Unit	Ecology and Parasitology

Lecturer
P. Deplazes, D. Hansen

Introduction
The lecture covers all levels of ecological complexity, from the reaction of individual organisms to their biotic and abiotic environment to the influence of resources and competition on the structure and dynamics of populations through to interactions between different species and the energy and material flows in ecosystems.

Objectives
– Characteristic of learning methods for the determination of density and distribution in space and time
– Understand abiotic and biotic causes of density and distribution
– Analyze dynamic interactions between different species
– Understand biodiversity as well as structure and processes in ecosystems
– Illustrate life cycles of infection and parasites on selected samples

Script
Will be sold during the 1st lecture.
### Module  Chemistry

**Teaching Unit**  Anorganic Chemistry
**Teaching Unit**  Organic Chemistry

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### Description of the module
The description of the module and the Objectives of this module can be requested in the office for Admission and Academic Services.

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### Module  Ethology, Animal Welfare and Animal Husbandry

**Teaching Unit**  Introduction Animal Welfare
**Teaching Unit**  Scientific basics in Animal Welfare
**Teaching Unit**  Special Animal Welfare topics
**Teaching Unit**  Ethology
**Teaching Unit**  Ethology and husbandry
**Teaching Unit**  Animal Ethics

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### Lecturer
H. Würbel et al.

### Introduction
During the introduction of this module students shall be sensitized on issues of animal welfare as well as in their professional competence of handling basic scientific findings. Important aspects of animal husbandry and the use of farm animals, zoo animals, pets and experimental animals are presented. With regard to process technology, bioclimatology, animal health and animal welfare shall be discussed. Normal behavior and attitude as well as husbandry- and use-related disorders of the major animal species which are significant for veterinary medicine are dealt with. Theoretical foundations of animal behavior and an introduction to behavior therapy are provided. In the training unit of animal ethics main ethical approaches and criteria of constantly required evaluation of interests between man and animal, using case studies, are presented and developed.

### Description of the module
The description of the module and the Objectives can be requested in the office for Admission and Academic Services (in German).
**Module**  
Epidemiology and Biostatistics

**Teaching Unit**  
Epidemiology and Biostatistics

**Lecturers**  
P. Torgerson et al.

**Introduction**
Epidemiology and biostatistics deal with the gathering, analyzing and interpretation of data in groups of individuals (populations). Important issues in veterinary medicine are: How many individuals are affected by a disease? Can typical patterns of disease be identified? Why are certain animals sick or stay healthy? How can transmission of disease be explained? How may diagnostic tests be judged? Epidemiology thereby provides methods for the planning of studies and collection of corresponding data from populations. Biostatistics uses these methods for the description of the collected data as well as the statistical testing of correlations. Both disciplines together form the foundation for accurate planning, evaluation and interpretation of scientific studies.

**Objectives**
- Ability to name and assign data types
- Explain and apply procedures to describe data (descriptive statistics)
- Explain five anchor terms in the context of random samples
- Describe and apply the concept of hypothesis testing
- Identify the most commonly used statistical testing methods for simple topics/questions (for a description of a group, comparison group)
- Carry out selected statistical tests with the help of a simple statistical software and interpret the results
- Explain the concept of statistical testing and the significance of the statistical p-value
- Explain the concept of probability with/on selected examples
- Name mass figures in relation to association and incidence of disease and suggest in the context
- Describe the concept of the simplest models of infection in a population (SIR-concept)
- Describe approach/concept, objectives and methodology of evidence-based medicine (EBM)
- Describe a method for the calculation of costs/cost estimation in veterinary medicine
- Explain and apply diagnostic testing as well as the ten anchor terms
- Explain Bayes' theorem within the context of diagnostic
- Describe and compare epidemiological study types
- Ability to explain and apply the concept of causality
- To be familiar with/Know the steps of outbreak investigation/analysis and to be able to exemplary apply/to apply an/on example
- Name and explain the most important/key elements of risk analysis as well as ten anchor terms

**Self-test questions**
Integrated into exercises

**Learning Recommendation**
Preparation and follow-up of lecture notes and specified literature
Module  
Fundamentals in Anatomy and Physiology

Teaching Unit  Basic Anatomy
Teaching Unit  Basic Physiology

Lecturers
H. Augsburger, A. Boos, M. Gassmann, T. Lutz

Introduction
In this module you will get an overview of the anatomy and physiology of all organ systems. This module lays the foundation for the understanding of the organism as a whole and as preparation for the organ-centered teaching in the 2nd and 3rd academic year. The study of anatomical forming will be carried out on fixed and fresh organs.

Objectives
– Classify organ systems and specify their parts
– Identify different organs and describe their function
– Illustrate essential species-specific features of the organ systems, organs and parts of organs with respect to structure and function
– Illustrate function of the organ, respectively body parts as a whole, within the organism
– Describe the size of the organ and demonstrate the position in the body
– Illustrate and name structure and function of organs and describe functionally and clinically important organ parts
– Name the tissue types involved in the development of organs
– Illustrate regulatory mechanisms of the homeostasis within the organism as well as their significance in maintaining the function of the entire organism
– Explain principles of organ control (endocrinological, neurological)
– Steuerungsmechanismen der einzelnen Organe beschreiben
– Describe control mechanisms of the individual organs

Electronic Teaching Aids
CLIVE educational software the library of the Vetsuisse Faculty.

Module  
Immunology

General Information about the module Immunology:

Electronic Teaching Aids
Webtool Immunology 1.5, blocks 1-3 of altogether 8, excl. sources and recess

Skript
Will be released in pdf format

Self-test questions
Integrated into the Webtool Immunology

**Learning Recommendation**
The modular Webtool Immunology, a joint development between Bern and Zurich, is the unified Vetsuisse teaching aid.

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**Teaching Unit**  
**Immunology I**

**Lecturer**
M. Suter

**Introduction**
In this teaching unit, the cellular and molecular basis of immunology is being taught (Prerequisite for Immunology II).

**Objectives**
- Knowledge of the cellular and molecular fundamentals of immunology and veterinary medicine (will be required in Immunology II)
- Knowledge of the anatomy of immunological organs and cells and the immune system in intestine, lung and central nervous system (will be presupposed in Immunology II)

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**Teaching Unit**  
**Immunology II**

**Lecturers**
M. Suter, N. Borel

**Introduction**
Introduction to the ontogenesis of the immune system and the development of immune memory. Thereby attention will be given to the specific immunological situation of young animals. Additionally, the physiological and pathophysiological (immunopathology) activity of the primary and secondary immune response of the body is being studied.

**Objectives**
- Understanding of specific aspects of ontogenesis: To acquire the repertoire of B cells on the basis, positive and negative selection of T-cells in the thymus with the aim to generate immune competent, but self-tolerant T-cells and immune protection in the young animal
- Understand how a primary and a secondary immune response takes place
- Formen und Ursachen von Immunpathologie (Autoimmunität, Allergie, Entzündung) verstehen
- To understand/understanding types and causes of immune pathology (autoimmunity, allergy, inflammation)
Module | Clinical Case Demonstrations
---|---
Teaching Unit | Clinical Case Demonstrations I and II

**Lecturers**
Clinicians of the Vetsuisse Faculty

**Description**
In the clinical case demonstrations, students are introduced to the fundamentals of veterinary thinking and action.

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Module | Organ system module Locomotor System
---|---
Teaching Unit | Organ system module Locomotor System

**Lecturer**
Different Lecturers of the Vetsuisse Faculty

**Introduction**
The block book will be provided at the beginning of the organ system modules.

**Objectives**
The organ system module locomotor systems imparts

– the knowledge of the anatomy of the musculoskeletal system and the movement of the body in all its variations
– the interaction of physical force, or reaction of the body
– the symptomatology and pathogenesis of diseases of the musculoskeletal system
– the link to the metabolism, physiology, the laboratory medicine, pathophysiology, endocrinology, and the nervous system
– the therapeutic and prophylactic measures in pathologies of the musculoskeletal system
– the prognostic outlook of pathologies of the musculoskeletal system
– the emergency procedures in trauma patients
– the therapeutic possibilities of treatment of fractures and treatment of joint injuries

Following skills will be acquired:

– performing an orthopedic examination
– the recognition of lameness
– the localization of the affected limb and the allocation of a pathological process to an anatomical structure
– illustration and interpretation of pathological changes in the musculoskeletal system with imaging techniques
– principles of wound dressing
Module                  Organ system module Blood, Immune Organs, Laboratory Medicine

Teaching Unit           Organ system module Blood, Immune Organs

Lecturers
Different Lecturers of the Vetsuisse Faculty

Introduction
The block book will be provided at the beginning of the organ system modules.

Objectives
- To know sampling and injection methods (blood collection, techniques, tubes, anticoagulants, impact of transport and storage, centrifugation, bone marrow collection, catheterization).
- Explain the composition and function of blood and its cellular and non-cellular components, recognize and differentiate blood cells.
- Explain the control of hematopoiesis and the building material required for blood formation.
- Explain the gas transport and describe the effect of oxygen binding to hemoglobin by different influencing parameters.
- Explain structure, function and arrangement of the lymphatic system and of lymphocytes, granulocytes, monocytes (phagocytes), platelets and dendritic cells.
- Explain morphological and functional principles of specific and innate defenses.
- Illustrate processes involved in hemostasis and coagulation, differentiate their pathological disorders and list different treatment options.
- Know blood group properties in animals and evaluate their implications for blood transfusion.
- Recognize and interpret main response patterns (inflammation, stress, infection) of the blood-forming organs and immune organs and tissues.
- Know the most important diseases and their treatment of the hematopoietic system, the immune system and immune organs, including neoplasia, for adults and neonates.
- Know the main tools and methods in the laboratory.
- Know factors affecting accuracy and precision.
- Explain reference values. Evaluate and name deviations from the reference interval.
- Know blood and immune organ-specific laboratory test and evaluate laboratory results.
- Know the histological structures of bone marrow and of the different stages of the maturation of blood cells.
- Know possibilities and limitations of the morphological assessment of bone marrow, extramedullary hematopoietic organs, central and peripheral immune organs (including immunohistochemical methods).
- Know main differences of immune elements between neonates and adults.
- Know relevant diagnostic practices during the perinatal period.
Introduction
The block book will be provided at the beginning of the organ system module.

Introduction
Building on the learning matter of the 1st academic year, the morphology and physiology of the reproductive organs and the mammary gland shall be deepened as well as the fundamental features of the development of these organs expanded. Basics of sterility- and gravidity diagnostics as well as selected biotechnological methods will be taught in practice and theory. The most important aspects of diagnosis, therapy and prevention of diseases of the female and male sexual organs as well as the milk gland will be worked out using exemplary case studies. In addition, possibilities of prevention and suppression of reproduction are explained and discussed.

Objectives
The organ system module skin, thermoregulation imparts knowledge
- Macroscopic and microscopic anatomy and embryology of the skin and its appendages; Topography, microscopic anatomy and embryology of the thyroid
- Macroscopic and microscopic anatomy and embryology of the skin and its appendages, topography, microscopic anatomy and embryology of the thyroid gland
- Physiology of the skin sensors, thermoregulation and thyroid hormones (species-specific features)
- Pathophysiology of fever
- Allergic, bacterial, parasitic skin diseases, distinguish fungal, endocrine and autoimmune diseases of the skin
- Skin tumors
- Otitis externa
- Other diseases (such as papilloma, psychogenic alopecia)
- Skin Specific bacteriology and mycology
- Ectoparasites
– Specific skin immunology
– Skin-specific pharmacology

<table>
<thead>
<tr>
<th>Module</th>
<th>Organ system module Heart, Circulation, Respiration</th>
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<tr>
<td>Teaching Unit</td>
<td>Organ system module Heart, Circulation, Respiration</td>
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**Lecturers**
Different Lecturers of the Vetsuisse Faculty

**Introduction**
The block book will be provided at the beginning of the organ system module.

**Objectives**
– Knowledge of structure (anatomy, histology, radiological anatomy) and function (physiology) in the normal condition, especially of species-specific characteristics and knowledge of the embryonic development
– Familiarize and recognize clinical pathological changes in various species
– Ability to examine and know leading symptoms
– Ability to carry out the clinical study program for detection of pathological changes in the cardio-respiratory tract
– Knowledge of differential diagnosis of clinical symptoms
– Ability to recognize or rule out the respiratory tract and/or heart and circulatory apparatus as place of disease in diseased animals
– Knowledge and understanding of major diseases of the respiratory and cardio-vascular apparatus within the differential diagnosis
– Knowledge and understanding of (the) pathophysiological processes associated with underlying diseases
– Know and understand processes of adaptation (compensatory mechanisms) under varying loads
– Knowledge and understanding of (the) key pathological organ changes, (the) possible reaction patterns in particular
– Ability to describe morphological changes
– Recognition of acute vs. chronic changes
– Ability to link clinical and para clinical subjects
– Knowledge of advanced diagnostic capabilities, ability to use this analogously; (and) basic skills in interpreting the results (X-ray, endoscopy, ECG)
– Knowledge of the main available drugs/pharmaceuticals, their effects, mechanisms of action, side effects and (their) appropriate use
– Knowledge of surgical therapeutic possibilities, (their) indications, of their complications and (their) invasiveness.
Module | Organ system module Kidney, Salt-/Water Balance
---|---
Teaching Unit | Organ system module Kidney, Salt-/Water Balance

Lecturers
Different Lecturers of the Vetsuisse Faculty

Introduction
The block book will be provided at the beginning of the organ system module.

Objectives
– Knowledge of the macroscopic and microscopic structure of the kidneys, function of the various sections for (the) formation of urine, urine concentration and excretion
– Ability to describe location and macroscopic anatomy of the kidneys, ureters, bladder and urethra, including (the) blood vessel supply, (the) innervation and (the) major differences in animal species
– Ability to explain basic features of the development of the urinary tract with (the important) potential for malformations
– Ability to explain basic features of the development of the urinary tract with (important) potential for malformations
– Ability to illustrate the regulation of the salt, water and acid/base balance as well as therefrom resulting principles for pharmacological treatment of any occurring disorders
– Know the examination methods of the urinary tract and to (be able to) perform an independent examination of the urinary tract
– Ability to recognize pathological manifestations of patterns and findings of kidney and urinary tract
– Ability to identify typical clinical symptoms of diseases of the urine forming organs and urinary tract as well as to interpret typical laboratory findings
– Ability to describe disorders and mechanisms leading to renal failure
– Illustrate diseases which may lead to the clinical picture of uremia and nephrotic syndrome
– (To be able) to differentiate urine forming organs and urinary tract disorders from other diseases
– Ability to explain the formation and treatment of urolithiasis
– Ability to explain the formation and treatment of problems in micturition, respectively urinary incontinence
– To know the main surgical treatment options: surgical removal of kidney stones, urethrotomy, Laparozystotomie, laparoscopic surgery, nephrectomy

Module | Organ system module Digestion and Metabolism
---|---
Teaching Unit | Organ system module Digestion and Metabolism

Lecturers
Different Lecturers of the Vetsuisse Faculty

Introduction
The block book will be provided at the beginning of the organ system module.
Objectives
Acquire of knowledge of fundamental structures and functions of the digestive tract and associated glands, in order to understand response patterns of the organ systems after exposure to various toxicants. That fosters an understanding of the significance of this response pattern in the pathogenesis of diseases of this organ system and associated systemic diseases, which affect the entire body. Fundamental knowledge provide the diagnosis, treatment and prevention of diseases of the digestive system.

Module
Organ system module CNS, Sensory Organs

Teaching Unit
Organ system module CNS, Sensory Organs

Lecturers
Different Lecturers of the Vetsuisse Faculty

Introduction
The block book will be provided at the beginning of the organ system module.

General Objectives to the section of the central nervous system
- Knowledge of the structure and function of the CNS, particularly as basis for reflexes, motor skills, sensory awareness and behavior; bases on disorders thereof
- To know and understand the neurological examination procedures for different animal species in its (full) particulars
- Define by location of lesions, the spectrum of possible diseases
- To know the most important possibilities for further diagnostic evaluation
- To know the main neurological diseases in different animal species, especially concerning etiology, pathological mechanisms, diagnosis and treatment options
- Fundamentals of pain and pain elimination

General (learning) objectives for the partial area of the eye
- Knowledge of the structure and function of the eye as well as the modalities of information transfer to the CNS and the information processing at this location
- Guidelines of the clinical examination of the eye, including the basic equipment required
- Understanding the interrelationships between pathological processes and loss of normal functions
- Knowledge of the symptoms and pathogenetic mechanisms of the major eye diseases, including selected inherited eye diseases in dogs
- To be able to perform a simple clinical eye examination
Module | Parasitology
---|---
Teaching Unit | Parasitology I

**Lecturers**
P. Deplazes et al.

**Introduction**
Teaching contents of this module are the intestinal helminths: cestodes, trematodes and nematodes.

**Objectives**
- Knowledge of occurrence, development, pathogenesis, clinical manifestations, diagnosis, therapy and prophylaxis of major veterinary medical, intestinal helminths
- Based on the conveyed content on the biology of parasites and immunology, pathogenesis and diagnostics of parasitic diseases, according to current state of knowledge, the students should be able to identify, treat and monitor for the individual animal relevant parasitic.

**Self-test questions**
Will be distributed at the end of the semester.

**Learning Recommendation**
Take advantage of contact hours with demonstrations and exercises and study documents.

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**Teaching Unit | Parasitology II**

**Lecturers**
P. Deplazes et al.

**Introduction**
Teaching contents of this module are parasitic protozoa and veterinary arachno-entomology.

**Objectives**
- Knowledge of occurrence, development, pathogenesis, clinical manifestations, diagnosis, therapy and prophylaxis of veterinary medically important parasitic protozoa and arthropods.
- With the contents conveyed regarding biology, parasites and immunology, pathogenesis and diagnosis of parasitic diseases, students should be able to identify, treat and monitor individual animals for the relevant parasitic, based on the current state of knowledge.

**Self-test questions**
Will be distributed at the end of the semester.

**Learning Recommendation**
Schwerpunkte und Gewichtung des Stoffes werden in der Vorlesung vermittelt. Focal points and weight of the material will be taught in the lecture.
Module  Physics

Teaching Unit  Physics

**Module Description / Description of the Module**
Description and Objectives of this module may be requested from Admission and Academic Services.

**Module  Propaedeutic**

**Teaching Unit  Propaedeutic I**

**Lecturers**
Clinicians of the Vetsuisse Faculty

**Introduction**
The students will be introduced in lectures and exercises with the investigative methods and terminology of internal medicine in horses, cattle, swine and small animals. In addition, the interpretation of clinical findings and administration of drugs is being taught.

**Objectives**
– Purpose of propaedeutics
– Case history (inquiry and characterization of the problem, gather questions about general health, living and keeping conditions/husbandry, stock problems)
– Recording of personal description
– (General) assessment (behavior, nutritional status, physique)
– Examination of the lymph nodes and mucous membranes
– Administration of medication

**Script**
Small Animals: The script (medical) propaedeutic and copies of the PowerPoint slides shown in the lecture shall be made available
Bovine: Scripts and handouts
Equine/Horse: Scripts
Porcine: Brief introduction to porcine propaedeutic
Exotic Pets: Copies of the PowerPoint slides shown in the lecture will be provided. Sale of educational CD

**Self-test questions**
Small Animals: Shall be integrated and discussed during the next lecture
Bovine: Self-test questions are included into the lecture (content)
Equine/Horse: Included into the lecture (content)
Exotic pets: Included into the lecture (content) and discussed during the following lecture


**Teaching Unit**  
**Propaedeutic II**

**Lecturers**  
Clinicians of the Vetsuisse Faculty

**Introduction**  
Refer to block book. Courses in communication (I and II), small animal surgery, small animal medicine, equine/horse medicine/-surgery, livestock medicine, laboratory medicine, porcine medicine

**Objectives**  
Training in: Communications in everyday practice, dealing with difficult communication situations, handling of animals, examination course, surgery, pre-analysis, laboratory testing and laboratory equipment in the veterinary practice

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**Module**  
**Radiation Physics and General Radiology**

**Teaching Unit**  
**Radiation Physics and General Radiology**

**Lecturer**  
P. Kircher et al.

**Introduction**  
This course provides the physical foundations of all imaging techniques (radiography, ultrasound, computed tomography, nuclear medicine, magnetic resonance imaging) and their applications in veterinary medicine. Furthermore, the risks and effects of ionizing radiation will be discussed and radiation protection regulations explained. The lectures/symposia, incl. e-learning (RadioSurfVet) are the prerequisite for the acquisition of image interpretation, which represents an integral part of the diagnostic processing of a patient.

**Objectives**

- Illustrate the physical principles in the emergence and spreading of ionizing radiation and ultrasound waves
- Illustrate the most important design elements of customary X-ray and ultrasound machines
- Describe key interactions of X-rays and other ionizing radiation as well as ultrasonic waves with matter
- Ability to describe biological implications of interactions of X-rays and other ionizing radiation with matter and derive from them desirable and undesirable effects
- Describe structure and function of the most common types of equipment, imaging systems and tools used in X-ray and ultrasound diagnostics
- Describe physical and chemical processes occurring during the development while developing an ultrasound or X-ray image
- In dealing with ionizing radiation, take necessary measures to protect humans and animals
- Illustrate principles and indications of other imaging techniques (MRI, CT and more)
Ability to professionally label and archive X-ray and ultrasound images

Script
The link to RadioSurfVet will be announced during the introduction, at the beginning of this module.

Learning Recommendation
We recommend to work through the script before the lecture and to try to answer the questions after the lecture. During the colloquia, independently acquired knowledge, based on the e-learning tool, shall be deepened and questions answered in discussion with the lecturers. The e-learning tool, based on above-mentioned script, is the foundation for the colloquia.

Module   Veterinary Public Health I
Teaching Unit   Principles of Food Safety

Lecturer
R. Stephan

Introduction
Veterinary Public Health can be defined as follows: Veterinary Public Health (VPH) is a component of public health activities devoted to the application of professional skills, knowledge and resources for the protection and improvement of human health (WHO/FAO 1975). The special field of veterinary food safety and hygiene is a subfield of VPH. Any intervention with a farm animal is also an intervention in the food production chain. This modules aim is to provide you with principles in the field/in the area of veterinary food hygiene. On this basic knowledge will be further build during the ‘Focus Curriculum VPH’.

Objectives
– Knowledge of slaughter process stages in cattle and pigs
– Knowledge of principles of food safety measures in meat production
– Basic knowledge of meat maturation
– Knowledge of principles of food safety measures in milk production
– Basic knowledge of the quality parameters of milk
– Basic knowledge about methods for extending shelf life
– Basic knowledge of technology of selected meat and dairy products
– Knowledge of HACCP system as a tool for in-process security
– Basic knowledge of major food infection- and intoxication pathogens

Self-test questions
Will be specified in the accompanying lecture scripts
Module | Veterinary Public Health I
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Teaching Unit | Clinical Epidemiology and Evidence Based Medicine

Lecturers
P. Torgerson et al.

Introduction
In depth study and repetition of epidemiological learning material from the first study year. Presentation of concepts, using examples of Veterinary Public Health, evidence-based medicine and SIR models. Additionally, outbreak investigations are described in greater detail, survival analysis carried out and decision trees constructed.

Objectives
– Ability to apply selected measured value in relation to association and incidence of diseases
– Ability to name and compare study types
– Ability to name investigative steps in relation to an outbreak
– Ability to explain and apply Bayes Therorem in diagnostics
– Ability to record and interpret simple decision trees
– Ability to describe principles of survival analysis
– Ability to describe concept and goal of EBM
– to evaluate scientific publications by EBM criteria

Self-test questions
With the exercises provided during the lecture, you will be able to test yourself.

Learning Recommendation
Using pre-and post-backup script

Module | Virology
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Teaching Unit | Virology I

Lecturers
M. Ackermann et al.

Introduction
In Virology I, the principles of general virology are presented. Students learn what a virus is and how it behaves within cells, its host and the host population. In addition, students learn the principles of prophylaxis, treatment and diagnosis of viral diseases. Finally, a number of important families of viruses are discussed.
Objectives
Understand the principles of general virology
Understand the principles of virus-cell interaction, virus-host interaction and the virus-host population interaction
Know the principles of diagnosis, treatment and prophylaxis of viral disease

Electronic Teaching Aids
CD Allgemeine Virologie

Lecture notes
Allgemeine Virologie, Virustaxonomie, Familienalbum der Viren

Self-test questions
On CD, Examination Questions Virology

Learning Recommendation
Lecture notes, CD, Examination Questions Virology

Teaching Unit Virology II

Lecturers
M. Ackermann et al.

Introduction
In Virology II different Virus portraits are discussed.
Specific problems (Virology, Pathogenesis, Epidemiology, Diagnostics, Prophylaxis) are discussed with examples of some virus families and are connected to the environment of the infections (species, animal handling, etc.).

Objectives
Knowledge of virus infections relevant to veterinary medicine
Understanding of different mechanisms of pathogenesis
Understanding of epidemiologic basics of different viruses
Diagnostic principles of proof for virus infections

Electronic Teaching Aids
CD Allgemeine Virologie

Lecture notes
Allgemeine Virologie, Virustaxonomie, Familienalbum der Viren

Self-test questions
On CD, Examination Questions Virology

Learning Recommendation
Lecture notes, CD, Examination Questions Virology