Freie Universität Berlin

Veterinary Medicine

International Study Guide

Veterinary Medicine

1. The Faculty of Veterinary Medicine Introduces Itself:

The Veterinary Faculty of the Freie Universität Berlin is currently divided into three main campuses. The primary campus with all of the clinics, the dean's office and the new library is in Zehlendorf, located on the former Prussian estate "Düppel", with the old distillery and manor house still intact. Some departments are located in the Dahlem and Steglitz areas. Additionally, some buildings of the former Veterinary Faculty of the Humboldt-Universität in the district Mitte are being used for research and education.

In the near future it is planned to consolidate all departments and thereby the entire veterinary education at the Düppel campus.

Approximately 160 students are admitted to the veterinary programme each year. In the summer semester 2003 a total of 1247 students were matriculated in the veterinary medicine programme, about 81% females. Presently 38 professors, 97 research and teaching assistants and 253 supporting personnel are responsible for the education at the Faculty of Veterinary Medicine. Together with students of human and dental medicine as well as pharmacy, the pre-clinical natural sciences botany, chemistry, physics, and zoology are instructed at the respective faculties of the Freie Universität in Dahlem. The students also receive additional instruction from the Agricultural-Horticultural Faculty of the Humboldt-Universität zu Berlin.

The clinical portion of the veterinary programme takes place at the charming Düppel campus with modern clinics and departments designed with contemporary architectural knowledge. An attractive cafeteria makes for a nice place to spend a short break.

The Institute of Zoo and Wildlife Research is located in Berlin-Friedrichsfelde and offers optional pre-clinical and clinical courses.

In co-operation with its partner the Chiang Mai University in Thailand, the „Weiterbildenden Studien Internationale Tiergesundheit" (Continued Education International Animal Health) is offering a two-year MSc course in Public Health (VPH) for the south-east Asian region, taught in English. This course is the first programme offered by the „International Graduate School for Veterinary Public Health", currently in the process of organisation at our Faculty.

The Faculty of Veterinary Medicine has a very interesting and diverse history. On the initiative of the Prussian King Friedrich Wilhelm II, the Faculty was founded as the „Berliner Tierarzneyschule" (Berlin School of Animal Medicine) located at the Reußschen Garten outside of town on June 6th, 1790 (prior to the foundation of the Berlin University). The zootomy dome with its „Theatrum anatomicum", built by the renowned architect C.G. Langhans (builder of the Brandenburg Gate) goes back to this time and still exists in good condition. In 1887 the school was renamed „Tierärztliche Hochschule" (Veterinary College), and shortly thereafter achieved international recognition and prestige. In 1910 the right to grant the Doctor title was bestowed upon the Veterinary College, and in 1918 the college was given the right to grant the habilitation title.

In 1934 the Veterinary College was integrated into the Faculty of Agriculture-Veterinary Sciences of the Berliner Friedrich-Wilhelm-Universität and was given the status of an independent Veterinary Faculty in 1939.
During the last years of the Second World War instruction was suspended, but the Faculty became active again in January of 1946, as part of the Berliner Universität, which was soon thereafter renamed Humboldt-Universität.
The political doctrine installed upon the university and its faculties by the government of the German Democratic Republic (GDR), removing academic freedom, became unbearable to many. Therefore a fraction of students, professors and assistants decided to leave the Veterinary Faculty of the Humboldt-Universität in 1951. They founded the Veterinary School that became part of the Freie Universität, created in the western part of the city three years before. This School was given the status of Faculty in 1952.
In 1968 the East Berlin Veterinary Faculty merged with the Agricultural Faculty and was collectively renamed the College of Animal Production and Veterinary Medicine. Due to fundamental political changes in the western part of the city in the same year and reforms of the University system the Faculty of Veterinary Medicine became the Department of Veterinary Medicine and was subdivided into 20 scientific institutes (wissenschaftliche Einrichtungen- WEn).
After the fall of the wall, the two veterinary schools of the city were merged together by law in 1992, resulting in the current (since 1997) Faculty of Veterinary Medicine under the management of the Freie Universität Berlin.

For more information see:
http//www.vetmed.fu-berlin.de

1.1 Co-operating Departments

The Veterinary Programme enjoys co-operation with the following Departments of the Freie Universität Berlin:

- Department for Experimental Physics
- Department for Inorganic and Analytical Chemistry
- Department for Organic Chemistry
- Department for Plant Physiology and Microbiology
- Department for Zoology
- Department for Animal Physiology

Additional co-operation regarding instruction:

- Faculty of Agriculture and Horticulture of Humboldt - Universität Berlin
- The Berlin Zoo
- IZW (Institute for Zoo Animals and Wildlife)

Additional courses in computer hardware and software are offered by ZEDAT (Zentraleinrichtung für Datenverarbeitung an der Freien Universität Berlin)

For more information see:
http//www.zedat.fu-berlin.de

1.2 Important Addresses at the Faculty

Dean's Office
Oertzenweg 19 b, 14163 Berlin
Tel.: 0049 30 / 8 38-6 24 24/26
Fax: 0049 30 / 8 38-6 24 31
E-Mail: dekanat@vetmed.fu-berlin.de

Student Advisor:
Univ.-Prof. Dr. Johanna Plendl,
Dr. Christoph Mülling
Koserstr. 20, 14195 Berlin
Tel.: 0049 30 / 8 38-5 34 82, 838-5 39 54

Commission for Postgraduate Studies
Chairman: Univ.-Prof. Karl Dietrich Weyrauch
Secretary: Brigitte Zierau
Oertzenweg 19 b, 14163 Berlin
Tel.: 0049 30 / 8 38-6 26 12
Fax: 0049 30 / 8 38-6 24 31
E-Mail: promotionsbuero@zedat.fu-berlin.de

Representative of the SOKRATES/ERASMUS-Programme
Univ.-Prof. Dr. Karl Dietrich Weyrauch
Koserstraße 20, 14195 Berlin
Tel.: 0049 30 / 8 38-5 35 66
E-Mail: weyrauch.kd@vetmed.fu-berlin.de

Co-ordinator for the TEMPUS-Project
Univ. Prof. em Dr. Dr. h.c. Franz Hörchner
Univ. Prof. Dr. Karl-Hans Zessin
Luisenstr. 56, 10117 Berlin
Tel.: 0049 30 / 20 93-60 63
Fax: 0049 30 / 20 93- 63 49

Infocentre
Chief: Dr. Holger Kulemeyer
Infocentre Düppel
Oertzenweg 19b, 14163 Berlin
Tel.: 0049 03 / 8 38-6 26 36
E-Mail: library@vetmed.fu-berlin.de

Committee for the Veterinary Pre-clinical Boards
Chairman: Univ.-Prof. Dr. Klaus-Dieter Budras
Koserstr. 20, 14195 Berlin
Tel.: 0049 30 / 8 38-5 35 55
E-Mail: budras@vetmed.fu-berlin.de

Committee for the Veterinary Boards
Chairman: Univ.-Prof. Dr. Eberhard Schein
Königsweg 67, 14163 Berlin
Tel.: 0049 30 / 8 38-6 23 24
E-Mail: schein@zedat.fu-berlin.de

1.3 Addresses of the Departments and Clinics

Department for Veterinary Anatomy
Institut für Veterinär-Anatomie (WE1)
Koserstr. 20, 14195 Berlin,
Tel.: 838-5 35 55
Fax: 838-5 34 80
E-Mail: anatomie@vetmed.fu-berlin.de

Department for Veterinary Physiology
Institut für Veterinär-Physiologie (WE 2)
Oertzenweg 19 b, 14163 Berlin
Tel.: 838-6 26 00
Fax: 83 8-6 26 10
E-Mail: physiologie@vetmed.fu-berlin.de

Department for Veterinary Biochemistry
Institut für Veterinär-Biochemie (WE 3)
Oertzenweg 19 b, 14163 Berlin
Tel.: 838-6 22 25
Fax: 838-6 25 84
E-Mail: biochemie@vetmed.fu-berlin.de

Department for Animal Nutrition
Institut für Tierernährung (WE 4)
Brümmerstr. 34, 14195 Berlin
Tel.: 838-5 22 56
Fax: 838-5 59 38
E-Mail: ian@zedat.fu-berlin.de

Department for Virology
Institut für Virologie (WE 5)
Königin-Luise-Str. 49, 14195 Berlin
Tel.: 838-5 55 12/11
Fax: 838-5 55 61
E-Mail: virologie@vetmed.fu-berlin.de

Department for Immunology and Molecular Biology
Institut für Immunologie und Molekularbiologie (WE 6)
Luisenstr. 56, 10117 Berlin
Tel.: 2093-64 68
Fax: 20 93-61 71
E-Mail: immunologie@vetmed.fu-berlin.de

Department for Microbiology and Infectious Diseases
Institut für Mikrobiologie und Tierseuchen (WE 7)
Philippstr.13, 10115 Berlin
Tel.: 2093-6335
Fax: 2093-6067
E-Mail: mikrobiologie@vetmed.fu-berlin.de

Department for Food Hygiene
Institut für Lebensmittelhygiene (WE 8)
Königsweg 69, 14163 Berlin
Tel.: 838-6 25 50/2551
Fax: 838-6 25 52
E-Mail: lmhg@vetmed.fu-berlin.de

Department for Meat Hygiene and Technology
Institut für Fleischhygiene und -technologie (WE 9)
Brümmerstr. 10, 14195 Berlin,
Tel.: 838-5 27 90
Fax: 838-5 27 92
E-Mail: fleischhygiene@vetmed.fu-berlin.de

Department for Animal and Environmental Hygiene
Institut für Tier- und Umwelthygiene (WE 10)
Luisenstr. 56, 10117 Berlin
Tel.: 2093-6324
Fax: 2093-6323
E-Mail: tierhygiene@vetmed.fu-berlin.de

Department for Animal Welfare, Behaviour, and Lab Animal Biology
Institut für Tierschutz, Tierverhalten und Labortierkunde (WE 11)
Krahmerstr. 6, 12207 Berlin
Tel.: 8445-3800
Fax: 8339-389
E-Mail: tierschutz@vetmed.fu-berlin.de

Department for Veterinary Pathology
Institut für Veterinär-Pathologie (WE 12)
Robert von Ostertag Str. 15, 14163 Berlin
Tel.: 838-6 24 50
Fax: 838-6 25 22
E-Mail: pathologie@vetmed.fu-berlin.de

Department for Parasitology and Tropical Veterinary Medicine
Institut für Parasitologie und Tropenveterinärmedizin (WE 13)
Königsweg 67, 14163 Berlin
Tel.: 838-6 23 10
Fax: 838-6 23 23
E-Mail: parasitologie@vetmed.fu-berlin.de

Postgraduate Studies Tropical Veterinary Medicine
Postgraduierte Studien Tropenveterinärmedizin
Luisenstr. 56, 10117 Berlin
Tel.: 2093-6063
Fax: 2093-6349
Königsweg 67, 14163 Berlin

Department for Pharmacology and Toxicology
Institut für Pharmakologie und Toxikologie (WE 14)
Koserstr. 20, 14195 Berlin
Tel.: 838-5 32 14
Fax: 838-5 31 12
E-Mail: pharmakologie@vetmed.fu-berlin.de

Department for Poultry Diseases
Institut für Geflügelkrankheiten (WE 15)
Koserstr. 21, 14195 Berlin
Tel.: 838-5 38 61
Fax: 838-5 58 24
E-Mail: gefluegelkrankheiten@vetmed.fu-berlin.de

Department for Biometry and Information Processing
Institut für Biometrie und Informations-verarbeitung (WE 16)
Oertzenweg 19b, 14163 Berlin
Tel.: 838-6 30 91
Fax: 838-6 29 00
E-Mail: biometrie@vetmed.fu-berlin.de

Equine Clinic, Surgery and Radiology
Klinik für Pferde, Allgemeine Chirurgie und Radiologie (WE 17)
Oertzenweg 19 b, 14163 Berlin
Tel.: 838-6 22 99
Fax: 838-6 23 00
pferdeklinik@vetmed.fu-berlin.de

Buiatric Clinic
Klinik für Klauentiere (WE 18)
Königsweg 65, 14163 Berlin
Tel.: 838-6 22 61
Fax: 838-6 25 12
E-Mail: rinder@vetmed.fu-berlin.de

Reproduction Clinic
Tierlinik für Fortpflanzung (WE 19)
Königsweg 63, 14163 Berlin
Tel.: 838-6 2618
Fax: 838-6 26 20
E-Mail: fortpflanzungsklinik@vetmed.fu-berlin.de

Small Animal Clinic
Klinik und Poliklinik für Kleine Haustiere (WE 20)
Oertzenweg 19 b, 14163 Berlin
Tel.: 838-6 23 56/24 22
Fax: 838-6 25 21
E-Mail: kleintierklinik@vetmed.fu-berlin.de

2. International Partnerships and Contacts

The Faculty of Veterinary Medicine of the Freie Universität Berlin has a partnership with École Nationale Vétérinaire d'Alfort (ENVA) /Paris, in which framework student seminars take place and instructors are often exchanged. In addition there are international contacts with the following universities and departments:

Country	Partnership
Albania	Faculty of Veterinary Medicine, Tirana
Australia	Maquire University, Sydney
Austria	FAO (Food and Agriculture Organisation of the UN), Vienna IAEA (International Atomic Energy Agency), Vienna Joanneum Research Forschungsgesellschaft mbH, Graz Clinic for Dermatology, Vienna University of Veterinary Medicine, Vienna
Belgium	European Commission DG XII Measurement and Testing Programmes, Brussels Faculty of Veterinary Medicine, Gent Faculty of Agriculture, Katholiek University of Leuven Federation Internationale de Laiterie, Brussels European Commission, Agriculture, Brussels University of Gent
Brazil	School of Veterinary Medicine, Bahia
Burkina Faso	Centre International de Recherche-Development sur l'Elevage en Zone subhumide (ClRDES), Bobo-Dioulasso
Canada	University of Alberta, Edmonton
Czech Republic	Faculty of Veterinary Medicine, Brno
Chile	Universidad Austral de Chile, Valdivia Universidad de Chile, Santiago
Costa Rica	Faculty of Veterinary Medicine, Heredia
Egypt	Assiut University, Assiut Veterinary Faculty, Cairo Faculty of Veterinary Medicine, Menoufia University, Sadatcity
Estonia	Agricultural University Tartu
Ethiopia	Addis Ababa University (AAU) Armauer Hansen Research Institute (AHRI), Addis Abbeba International Livestock Research Institute (ILRI), Addis Abbeba
Finland	National Veterinary and Food Research Institute, Helsinki University of Helsinki, Helsinki
France	CEN, Paris INRA – France, Nouzille Institute de Biologie Structurale Grenoble Institute Pasteur, Prof. Gasser, Paris
Gambia	ITC
India	Veterinary Hospital Ankola
Israel	IAV Hassan II, Rabat-Institute, Rabat Tel Aviv-University
Italy	Centre of Cytopharmacology, Milano CNR, Milano FAO (Food and Agriculture Organisation of the UN), animal health division, Rome Instituto di Microbiologia Universita degli Studi di Padova, Padova Instituto Zooprofilattico Sperimentale del Piamonte, Liguria e Valle d`Aosta, Torino Instituto Zooprofilattico S.p.A., Brescia International Committee on Systematic Bacteriology of the International Union of Microbiological Societies, Bologna Università degli Studi di Udine, Udine Università degli Studi di Verona, Verona Università di Pavia, Pavia
Japan	Hokkaido University, Sapporo Muroran Institute of Technology Osaka University Tokyo Institute of Psychiatry, Tokyo University of Tokyo, Tokyo
Kenya	International Livestock Research Institute (ILRI), Nairobi KETRI, Muguga Pan-African Rinderpest Control (PARC) Project, Nairobi Faculty of Veterinary Medicine, University of Nairobi, Nairobi
Kirgisia	Agricultural University of Kirgisia
Mali	CVL, Bamako
Netherlands	Faculty of Veterinary Medicine, Utrecht Intervet International, Boxmeer

Country	Partnership
Poland	August Cieszkowski University, Poznan
	National Veterinary Research Institute, Pulawy
	Polish Academy of Science
	Warsaw Faculty of Agriculture
Portugal	Marine Animal Resarch Station (MARS), Madalena – Pico Acores
Russia	Faculty of Veterinary Medicine, School of Agriculture, Nowosibirsk
Sambia	CVRI
South Africa	University of Stellenbosch
	Faculty of Veterinary Science, Onderstepoort
Spain	Banco de Tejidos Neurológicos, Universidad de Barcelona, Barcelona
Sweden	Swedish University of Agricultural Sciences, Uppsala
Switzerland	Department for Parasitology, Bern
	Int. Commission on Microbiological Specifications for Foods (ICMSF), Vevey
	University of Basel
	University of Zurich
Syria	Al-Baath-Universität, Hama
	University of Homs, Hama
Tanzania	ADRI, Dar-es-Salaam
	Sokoine University, Morogoro
Thailand	Chiang Mai, University
Turkey	Ankara Üniversitesi, Veteriner Fakültesi
	Besin Hijyeni ve Teknoljisi Anabilim Dali, Ankara
Uganda	International Livestock Research Institute (ILRI), Tororo
	Makerere University, Kampala, Mbarara University
Hungary	Faculty of Veterinary Medicine, Budapest
United Arab Emirates	UAE-University, Al Ain
United Kingdom	Animal Health Trust, Newmarket
	Biomedical sciences, Health and Safety Laboratory, Sheffield
	Medical Resarch Council, London
	Ministry for Agriculture, Fishery and Food (MAFF), Surrey
	Oxford University
	Public Health Laboratory Service, Newcastle upon Tyne
	University of Aberdeen, Aberdeen, Scotland
	University of Bristol, Langford
	University of Cambridge, Cambridge
	University of Wales, Aberystwyth
	University of Warwick, Coventry

Country	Partnership
USA	Cornell University, Ithaca, New York
	Gentech, California
	Harvard University, Boston
	Mass. Institute of Technology, Boston
	Medical School, Davis
	Memorial Sloan Kettering Cancer Center, New York
	Michigan State University, Michigan
	Neurolmmuno Therapeutics Research Foundation, Spartanburg
	Purdue University, Indiana
	Sacramento Medical Center
	School of Veterinary Medicine, University of Pennsylvania, Philadelphia
	Standford University
	Texas University
	The Scripps Research Institute, La Jolla, California
	UCLA- University of California, Los Angeles
	University of California, Davis
	University of California, Irvine, California
	University of Pennsylvania, Philadelphia
	University of Wisconsin, Madison
Vietnam	National Institute of Agricultural Science Hanoi

3. ECTS – at the Faculty of Veterinary Medicine

3.1 Socrates/ECTS Co-ordinator

Univ.-Prof. Dr. K.D. ***Weyrauch***
Institut für Veterinär-Anatomie
FB Veterinärmedizin
Koserstr. 20
14195 Berlin
Tel.: (0049 30) 838 5 35 66 or 838 5 35 55
Fax:(0049 30) 838 5 34 80
E-Mail: weyrauch.kd@vetmed.fu-berlin.de

3.2 Transcript of Records

Exchange students will receive their Transcripts of Records including ECTS credits and grades no later than one year after completion of their studies in Berlin. The co-ordinator for the SOCRATES/ERASMUS programme is responsible for providing transcripts, but it is the responsibility of the exchange student to provide the co-ordinator with course certificates in a timely manner. It is also the responsibility of the student to keep his / her course certificates, as without them it will not be possible to issue a transcript.

For classes in which an examination is normally not given (pertinent to many lectures), it is the responsibility of the exchange student to arrange an exam (oral or written) with the class instructor, so that credits may be awarded.

3.3 ECTS – Credits

At the Faculty of Veterinary Medicine ECTS credits are granted according to a given key worked out by other German Institutions. It is based on the work load arising from the different courses. For elective courses and compulsory optional subjects 0.5 credits are granted for each hour per week (HPW - one hour per week within the whole semester). A maximum of 10 credits per year can be earned in these courses.

3.4 Grading Scale

For the assessment of the students a scale of five grades (1 to 5) is generally used at the Faculty of Veterinary Medicine, with the following definitions:

sehr gut (1)
an excellent performance

gut (2)
a performance that is above average demands

befriedigend (3)
a performance that meets average demands in every respect

ausreichend (4)
a performance that qualifies for the demands despite of some imperfections

nicht ausreichend (5)
a performance with severe imperfections that does not meet the demands

For ECTS students this grading system is converted into the ECTS grading scale which consists of 6 grades with the following definitions:

A (equals 1.0 – 1.5)
▸ *hervorragend (excellent)*
an outstanding performance

B (equals 1.6 – 2.0)
▸ *sehr gut (very good)*
a performance above average demands with very few small mistakes

C (equals 2.1 - 3.0)
▸ *gut (good)*
a generally respectable performance with few essential mistakes

D (equals 3.1 – 3.5)
▸ *befriedigend (satisfactory)*
moderate performance with remarkable mistakes

E (equals 3.6 – 4.0)
▸ *ausreichend (sufficient)*
performance meets minimal demands

F (equals above 4.0)
▸ *nicht bestanden (fail)*
performance beneath minimal demands

4. Additional Student Services

4.1 Infocentre

The Faculty of Veterinary Medicine has an Infocentre that accommodates the Veterinary Library as well as a portion of the computer pool. In addition to modern library services, special services concerning electronic media and graphical services are also available.

For more information see:
http://www.vetmed.fu-berlin.de

4.2 Computerpool

The Faculty of Veterinary Medicine has a computer pool with 45 workplaces that are available for student use. These computers are available at the Düppel and Mitte campus and provide access to internet and e-mail or literature research from all locations.

4.3 Vetmedia-Group

At the Faculty of Veterinary Medicine, a working group is involved with the development of computer aided interactive instruction. The Vetmedia-group is led by:

Univ.-Prof. Dr. Wolfgang ***Heuwieser***
Tierklinik für Fortpflanzung
FB Veterinärmedizin
FU Berlin
Königsweg 63
14163 Berlin
Tel.: (0049 30) 838 6 22 75
Fax: (0049 30) 838 6 26 20
E-Mail: heuwiese@vetmed.fu-berlin.de

For more information see:
http://www.vetmedia.de

5. Curriculum

5.1 Organisation and Length of the Veterinary Programme

The veterinary programme should be completed in five years and six months. It is divided into a pre-clinical and a clinical course. Content, structure, and course of the veterinary programme at the Freie Universität Berlin is regulated by the conditions of study issued July 10, 2003 on the basis of the German Tierärztliche Approbationsordnung (TAppO), issued November 10, 1999. The veterinary education in pre-clinical courses and clinical courses are organised as follows:

5.1.1 Pre-clinical Studies (2 years)

1. Natural science part of the pre-clinical boards (Vorphysikum) with oral exams in the following subjects: Physics, Chemistry, Zoology, Botany including feed, toxic, and medicinal plants and General Radiology.
   The accompanying mandatory and elective courses are offered in the first year of study.
2. Anatomical and physiological part of the pre-clinical boards (Physikum) with oral exams in the following subjects: Anatomy, Histology and Embryology, Physiology, Physiological Chemistry (Biochemistry), Animal Breeding and Genetics.
   The accompanying mandatory and elective courses are offered in the first and second year of study.

5.1.2 Clinical Studies (3 years)

A prerequisite for commencing clinical studies is the successful completion of the pre-clinical boards.

First section of the veterinary boards with oral exams in the following subjects: Virology, Bacteriology and Mycology, Parasitology, Animal Nutrition, Husbandry and Hygiene.
The accompanying mandatory and elective courses are mainly offered in the third year of study.
The second section of the veterinary boards with oral exams in the following subjects: General Pathology and Special Pathological Anatomy and Histology, Internal Medicine, Surgery including Clinical Radiology, Physiology and Pathology of Reproduction, Poultry Diseases, Pharmacology and Toxicology.
The accompanying mandatory and elective courses are offered in the third and fourth year of study.
The third section of the veterinary boards with oral exams in the following subjects: Animal Welfare, Animal Disease Control, Food Safety including cross subject “Food”, Milk and Milk Hygiene, Meat and Poultry Hygiene, Regulation of Pharmaceutics and Controlled Substances, Legal and Forensic Veterinary Medicine.
The accompanying mandatory and elective courses are offered in the fourth and fifth year of study.

In addition to course work, the following internships are required:

- agricultural internship of 70 hours in at least 2 weeks;
- internship in a veterinary clinic or veterinary practice of 150 hours in at least 4 weeks after completion of the pre-clinical boards;
- 700 hours (in at least 16 weeks) after completion of the 9th semester;
- 75 hours (in at least three weeks) in a facility for the control of slaughterhouse or food hygiene after the completion of the 6th semester;
- 75 hours (in at least two weeks) in a facility for food safety controls after the completion of the 9th semester and
- 100 hours (in at least three weeks) in a slaughterhouse or meat inspection facility after the completion of the 8th semester.

The Committee for the Veterinary Boards must be informed before beginning an internship. Prerequisites, content, size and supervision of the practical education follow the standards of Federal legislation (see TappO).

5.2 Outline of the Curriculum

5.2.1 Pre-clinical Studies:

		SWS	ECTS Credits
Courses of 1st Semester			
Medical Terminology		1	0,5
Anatomy I		2	8
Dissection I		4	
Histology I		1	4
Histological Lab I		2	
Animal Breeding I		2	3
Experimental Physics		2	5
Physics Lab		2	
Chemistry Lab		5	10
General Org. and Inorg. Chemistry		4	
Zoology		5	6
Botany I		3	4
Compulsory Optional Subject			
	Sum	**33**	**40,5**
Courses of 2nd semester			
Biometry		2	2
History of Veterinary Medicine		1	1
Career Opportunities for Veterinarians		1	0,5
Situs Demonstration I		2	2
Ethology (Study of Animal Behaviour)		2	2
Agricultural Sciences		2	1
Animal Breeding - Livestock Evaluation		2	2
Animal Breeding II		2	3
Animal Welfare I		2	1
General Radiology incl. Physics of Radiation		3	4
Botany II Toxic and Nutrient Plants		2	2
Compulsory Optional Subject		2	
	Sum	**23**	**20,5**
Courses of 3rd semester			
Anatomy II		2	8
Dissection II		4	
Physiology I		4	6
Physiology Seminar		0,5	
Biochemistry I		4	8
Biochemistry Lab I		3	
Animal Feed Science		1	1
Compulsory Optional Subject		3	
	Sum	**21,5**	**23**
Courses of 4th semester			
Situs Demonstration II		2	2
Embryology		1	1,5
Histology II		1	4
Histological Lab II		2	
Physiology II		3	8
Physiology Lab		2,5	
Biochemistry II		3	6
Food Science Lab		2	2
Clinical Propaedeutic		7	6
Compulsory Optional Subject		3	
	Sum	**26,5**	**29,5**
Agricultural Internship (70 h)			2,5
	Sum 1.-4. semester		**120**

Completion of all pre-clinical Compulsory Optional Subjects will be awarded with 4 ECTS Credits. Elective subjects (a list of which may be requested from the dean's office) are awarded with 0,5 credits for each hour per week.

5.2.2 Clinical Studies:

	SWS	ECTS Credits
Courses of 5th semester		
Animal and Environmental Hygiene I	2	3
Animal and Environmental Hygiene II	2	
Animal Nutrition	2	2
Pharmacology and Toxicology I	2	2
Pharmacology and Toxicology (Seminar)	2	1
Parasitology	3	2
Virology I	2	2
General Immunology	1	1
Principles of Infectious Diseases and Epidemiology	1	1
General Pathology including Exercises	4	3
Laboratory Medicine Lab	2	1
Animal Reproduction I	1	1
Animal Reproduction Exercises	4	2
General Surgery	2	2
Medical and Surgical Diseases of Ruminants I	1	1
Compulsory Optional Subject	2	
Sum	**33**	**24**
Courses of 6th semester		
Animal Welfare II	2	3
Lab Animal Medicine and Disease	1	0,5
Animal Nutrition Lab	2	3
Pharmacology und Toxicology II	2	2
Virology II	0,5	0,5
Special Immunology	1	1
General Bacteriology and Mycology	1	1,5
Special Bacteriology and Mycology	0,5	
Bee Diseases	1	0,5
Fish Diseases	1	0,5
Special Pathology I including Exercises	2	2
Animal Reproduction II / Andrology	2	2
Clinical Radiology within Surgery	1	0,5
Surgical and Medical Diseases of the Horse I	2	2
Medical and Surgical Diseases of Ruminants II	2	1
Medical and Surgical Diseases of the Pig	1	1
Diseases of Small Animals I	2	2
General Food Hygiene	1	1
Clinical Demonstration I (Equine Clinic)	2	1,5
Clinical Demonstration I (Buiatric and Reproduction Clinic)	3	2
Clinical Demonstration I (Small Animal Clinic)	2	1,5
Compulsory Optional Subject	1	
Sum	**33**	**29**

	SWS	ECTS Credits
Courses of 7th semester		
Pharmacotherapy and Regulatory Issues (AVO)	2	2
Compounding Lab	1	1
Parasitology Lab	2	2
Virology Lab	2	2
Microbiology Lab	2	1,5
Epidemic Control I	1	1
Special Pathology II including Exercises	2	2
Diseases of Small Animal II	2	2
Obstretics	1	2
Diseases of the Teat and Udder	1	0,5
Surgical and Medical Diseases of the Horse II	2	2
Surgery and Anaesthesia	1	1
Ophthalmological Examination	1	1
Medical and Surgical Diseases of ruminants III	1	1
Clinical Demonstration II (Equine Clinic)	2	1,5
Clinical Demonstration II (Buiatric and Reproductive Clinic)	3	2
Clinical Demonstration II (Small Animal Clinic)	2	1,5
Compulsory Optional Subject	6	
Sum	**34**	**26**
Courses of 8th semester		
Poultry Diseases	2	2,5
Clinical Demonstration Poultry I	2	1,5
Necropsy I	1	1
Demonstration in Anatomical Pathology I	2	2
Veterinary Outpatient Treatment I (Equine Clinic)	0,5	0,25
Veterinary Outpatient Treatment I (Buiatric Clinic)	0,5	0,25
Veterinary Herd Management I (Buiatric Clinic)	0,5	0,25
Herd Management I (Reproduction Clinic)	0,5	0,25
Food Safety	1	1
Food Safety Lab I	2	2
Meat Hygiene – Lab	3	3
Meat Hygiene – Meat inspection	1	1
Meat Hygiene – Hygiene and Technology in Meat Production	1	1
Intensive Care (Equine Clinic)	2	2
Clinical Demonstration III (Buiatric and Reproduction Clinic)	3	1,5
Intensive Care (Small Animal Clinic)	2	2
Cross-Lecture Clinic	9	8
Compulsory Optional Subject		
Sum	**33**	**29,5**

	SWS	ECTS Credits
Courses of 9th semester		
Forensic Veterinary Medicine	2	2,5
Epidemic Control II	2	1,5
Necropsy II	1	1
Demonstration in Anatomical Pathology II	1	1
Veterinary Outpatient Treatment II (Equine Clinic)	0,5	0,25
Veterinary Outpatient Treatment II (Buiatric Clinic)	0,5	0,25
Veterinary Herd Management II (Buiatric Clinic)	0,5	0,25
Necropsy of Poultry and Poultry Outpatient Treatment	0,5	0,25
Clinical Demonstration Poultry II	2	1
Clinical Demonstration III (Equine Clinic)	2	1,5
Clinical Demonstration IV (Buiatric and Reproduction Clinic)	3	1,5
Clinical Demonstration III (Small Animal Clinic)	2	1,5
Surgery Lab	2	2
Food Safety Lab II	2	2
Milk Examination Lab	2	1
Milk Hygiene	1	0,5
Cross Lecture Food Safety within Food Safety Lab	9	8
Compulsory Optional Subject		
Sum	**33**	**26**
Internship in a Veterinary Clinic or Veterinary Practice I (150 h)		5
Hygiene Control (75 h)		2,5
Slaughterhouse or Meat Inspection Facility (100 h)		3,5
Food Safety Controls (75 h)		2,5
Internship in a Veterinary Clinic or Veterinary Practice II (700 h)		24
Sum 5.-9. Semester		**180**

Completion of all clinical Compulsory Optional Subjects will be awarded with 8 ECTS Credits.
Elective subjects are awarded with 0,5 ECTS Credits for each hour per week.

5.3 Courses Offered and Course Contents

5.3.1 General Remarks

All mandatory courses are calculated on a credit / semester basis. Elective sources can be used as a way of earning additional credits. The elective course contents can be tailored to individual requirements if the need to do so arises.

5.3.2 Obligatory Courses

1st Semester

Course: Medical Terminology	
Type of course	Lecture and lab / 1 hour per week
ECTS credits	0.5
Prerequisite	None
Course contents	Latin and Greek syllables and word use in the natural sciences and medicine. Structure of the Nomina Anatomica and related nomenclatures.
Test or examination	2 oral exams as part of anatomy exam during the semester

Course: Anatomy I and Dissection I	
ECTS credits	8.0
Anatomy I	
Type of course	Lecture / 2 hours per week
Prerequisite	None
Course contents	*Skeleton:* structure, organisation and skeletal connections. *Muscles:* location, function, innervation and ancillary structures. *Internal organs:* location, relationship to other organs, organisation, mesenteries, vascular and nerve supply and lymph nodes. *Neck:* cervical vertebrae, muscles of the neck, organs of the neck, vessels and nerves. *Thorax:* bones of the thorax, muscles, pleural relationship, organs, vessels and nerves. *Abdomen:* thorax and lumbar vertebral column, muscles, mammae. *Abdominal cavity:* organs, peritoneal relationship, vessels and nerves. *Pelvis:* skeletal structures, muscles. *Pelvic cavity:* organs, peritoneal relationships, vessels and nerves. *Thoracic extremity:* bones, muscles of the limbs, vessels and nerves, lymph nodes. *Pelvic extremity:* bones, muscles, vessels and nerves, lymph nodes. *Head:* bones, muscles, organs: oral cavity, pharynx, nasal cavity and nasal sinuses, larynx, eye and associated structures, ear. *Central Nervous System:* spinal cord: meninges, organisation and structure, brain: meninges, organisation and structure; blood supply.
Test or examination	Oral exam at the end of the semester

Dissection I

Type of course	Lab / 4 hours per week
Prerequisite	None
Course contents	Introduction to dissection of the dog; general osteology and thorax including spinal column and joints; skin, cutaneous muscles and nerves; dorsal and ventral muscles of the shoulder girdle; vessels, nerves, and cervical organs of the neck; bones and joints of the thoracic limb; vessels, nerves and muscles of the upper arm; vessels, nerves and muscles of the lower arm; muscles of the vertebral column, cutaneous nerves of the lumbar region; muscles of respiration; ventro-lateral body wall with mammary glands and prepuce; abdominal muscles; inguinal region; thoracic cavity with pleural cavities and lungs; heart and pericardium; vessels and nerves of the thoracic cavity with sympathetic trunk; topography of the abdominal organs and peritoneum; stomach and intestines with blood supply and innervation; accessory glands of the intestinal tract, autonomic nervous system; pelvic cavity with peritoneum, mesenteries and ligaments of the urogenital system; fossa ischiorectalis; pelvic girdle, bones and joints of the pelvic limb; vessels, nerves, and muscles of the hip joint; vessels, nerves and muscles of the lower leg; skull and joints of the head; superficial vessels of the head, facial muscles; Nn. mandibularis et maxillares; lacrimal apparatus, nerves and muscles of the eye; nose, nasal cavity, larynx, pharynx, guttural pouch; tongue, salivary glands, teeth; spinal cord and meninges, brain .
Test or examination	Students are given 5 oral exams during the semester covering the course content.

Course: Histology I and Histological Lab I

ECTS credits 4.0

Histology I

Type of course	Lecture / 1 hour per week
Prerequisite	None
Course contents	*Cytology:* The cell: introduction, cell definition, cytoplasm, plasmalemm, hyaloplasm, microtubuli, cell organelles, metaplasm, paraplasm; nucleus. Life of the cell: cell growth, multiplication of the cell (mitosis, meiosis), functional morphology of the cell.
	Histology: introduction, definition of tissues; epithelium: surface epithelium, glandular epithelium, sensory epithelium; connective tissue: mesenchyme tissue, reticular tissue, fat tissue, fibrous connective tissue, cartilage, bone; muscle tissue: smooth muscle, skeletal muscle, cardiac muscle; nerve tissue: nerve cells, neuroglia, nerve fibre, synapses; circulatory system: blood, blood vessels, lymph vessels; heart, hematopoiesis and bone marrow; immune system: thymus, lymph nodes, spleen, tonsils; skin and its appendages: skin, hair, skin glands (sweat, sebaceous, mammary glands), sensory structures of the skin, claw, hoof.
Test or examination	Oral exam at the end of the semester

Histology Lab I

Type of course	Lab / 2 hours per week
Prerequisite	None
Course contents	*Cytology:* cell, cytoplasm, nucleus, cell growth and multiplication *Histology:* Epithelium, connective tissue, muscle tissue, nerve tissue; circulatory system with blood, blood and lymph vessels, heart, hematopoiesis; immune system: bone marrow, thymus, lymph nodes, spleen, tonsils; skin and skin appendages: skin, hair, cutaneous glands, hoof.
Test or examination	Oral exam at the end of the semester

Course: Animal breeding I

Type of course	Lecture / 2 hours per week
ECTS credits	3.0
Prerequisite	None
Course contents	Basics of quantitative genetics, cytogenetics and molecular genetics, heritable disease; molecular genetic diagnostics, population genetics, estimation of breeding value and selection theory, applied selection, inbreeding, breeding methods, genome analysis and gene transfer, planning breeding, breeding organisations, preservation of genetic diversity.
Test or examination	Oral exam at the end of the semester

Course: Experimental Physics and Physics Lab

ECTS credits 5.0

Experimental Physics

Type of course Lecture / 2 hours per week

Prerequisite None

Course contents The lecture adheres strictly to the guidelines put forth in the course syllabus.
Mechanics: movement, force, work, energy and impulse, rotation of solid objects, friction; mechanics of stationary and moving fluids and gasses.
Thermodynamics: definitions of the terms: heat, temperature, heat transfer and states of matter.
Waves and acoustics including vibration.
Electricity: static electric fields, electric currents, circuits, static magnetic fields and magnetic properties of material, alternating currents and voltage, electromagnetic waves, effects of electricity on biological organisms.
Optics: lenses and their imperfections, the human eye, resolution and magnification of optical instruments.
Wave optics: diffraction and interference. Polarisation and measuring wavelengths, quantum optics (dualism, wave, particles).
Atomic and nuclear physics: explanation of light emission and absorption on an atomic level: Bohr's atomic theory, basics of nuclear organisation and radioactivity including measuring of radiation.

Test or examination Oral exam at the end of the semester

Physics Lab

Type of course Lab / 2 hours per week

Prerequisite None

Course contents The lab adheres strictly to the guidelines put forth in the course syllabus. Two mathematical exercises are part of the eleven lab reports that must be completed. The contents of exercises 1 and 2 include: functions and the graphing of functions, correct use of SI units, and the correct use of the most important units in mechanics.
The remaining 9 exercises cover the following three main topics:
Mechanics: fluid flow, calorimetric measurements, oscillations, thermal isolation.
Electricity: electrical resistance, thermal elements, oscilloscope, radioactivity.
Optics: thin lenses, microscope. Prism spectrometer, slit spectrometer.
An additional supplementary course is offered to help students with less prerequisite knowledge (participation is voluntary).

Test or examination Written final exam

Course: General Org. and Inorg. Chemistry and Chemistry Lab

ECTS credits 10.0

Chemistry Lab

Type of course Lab / 5 hours per week

Prerequisite None

Course contents 1. Atom structure and the periodic table of the elements., 2. Chemical bonds, 3. Aggregate stare, 4. Matter interactions with thermal, electrical and electromagnetic energy, 5. The chemical reaction, 6. Acids and bases, 7. Redox reactions, 8. Equilibria between states of matter, 9. Energy of chemical reactions, 10. Kinetic of chemical reactions, 11. Structure and reaction of organic bonds, 12. Structural formulas and nomenclature, 13. Aliphates and carbocyclics (hydrocarbons), 14. Heterocyclics, 15. Amines, 16. Mercaptans (thioles)/thioethers/disulfides/sulfonic acids, 17. Alcohol and ethers, 18. Phenols and chinones, 19. Aldehydes and ketones, 20. Carbonic acids, 21. Functional carbonic acids derivatives, 22. Stereochemistry of poly-functional molecules, 23. Hydroxy- and ketocarbonic acids, 24. Amino acids/peptide/proteins, 25. Saccharides (carbohydrates), 26. Complexes, 27. Lipids.

Test or examination Written final exam, multiple choice questions

General Org. and Inorg. Chemistry

Type of course Lecture / 4 hours per week

Prerequisite None

Course contents *Chemical reactions,* stoichiometry, quantification of reactants: mole, atomic structure, interactions of light and matter, periodic table of the elements, Properties, noble gases, aggregates, equilibrium of physical forms for perfect gasses, isotopes, atomic bonds, H_2 molecule, oxidation and reduction, halogens, electronegativity, halogen acids, polar atomic bonds, hydrogen bonds, chemical equilibrium; *Law of mass action,* reaction kinetics, half life, first order reactions, energy of reactions, Gibb's-Helmholtz-equation, energy profiles, energy of activation, open and closed systems, alkaline metals, metal bonds, ionic bonds, ionic net, alkali-halogens, chalcogens, O_2 molecule, ozone, hybridised orbitals, geometry of polyatomic molecules, * - and * bonds, mesomers, properties and structure of water, dissociation, pH, acids and bases (Brønstedt), neutralisation, *Indicators,* weak acids and bases, pKa, pKb, degree of dissociation *, *buffers*, buffering capacity, hydrogen peroxide, HOCl, chloric chalk, perchloric acid, strong and weak reducing and oxidising agents, *redox potential*, Nernst equation, pH- dependent potentials, pH measurement with glass

	electrodes, diffusion and membrane potentials, sulphur and its forms, coupled equilibrium, solubility products, heterogenic phase equilibrium, essential trace elements, toxicity and concentration, alkaline earth metals, creation and decay constants of complexes, chelators, denatate number, co-ordination number (boron and aluminium), nitrogen group, ammonia, hydrazine, hydroxylamine, nitrogen oxide, nitric and nitrous acid, apatites, multiple dissociation, condensation of phosphoric acid, phosphate buffer; carbon groups, carbon dioxide, hydrogen carbonate and carbonate, urea, phosgene, cyanide and its salts; introduction to silicon bonds, important side group elements (Fe, Cu, Co, Mo etc.)
Test or examination	Oral exam at the end of the semester

Course: Zoology

Type of course	Lecture / 5 hours per week
ECTS credits	6.0
Prerequisite	None
Course contents	*Biology fundamentals:* The cell, animal origins and diversity, reproduction and identical reproduction, ontogenesis, evolution, processes in the living organism, ecology.
Test or examination	Oral exam at the end of the semester

Course: Botany I

Type of course	Lecture / 3 hours per week
ECTS credits	4.0
Prerequisite	None
Course contents	*Introduction:* the plant, plant cells, compartmentalisation, cyto-skeleton, cell division, cell wall, stem, vascular tissue, secondary growth, stem derivatives, the leaf, leaf derivatives, adaptation to arid climates, plastids, photosynthesis, carbohydrate catabolism, mitochondria, physiology of C3-C4 plants, the root, nitrogen metabolism, special forms of nutrition, fat metabolism, reproduction of tallophytes, generation interval, developmental physiology, molecular developmental physiology, molecular developmental biology. *Growth:* auxins, cytokins, gibberillins, abscisic acid, ethylene, sprouting, senescence, exogenic factors of development, photochrome system, stimulation physiology, movement, nastic movements.
Test or examination	Oral exam at the end of the semester

2nd Semester

Course: Biometry

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	None
Course contents	Data collection, data preparation, measures of location, measures of dispersion, probability theory, binomial distribution, normal distribution, point and interval estimation, principles of bio-statistical hypothesis testing procedures, applications of bio-statistical hypothesis testing procedures, measures of association, correlation analysis regression analysis.
Test or examination	2 written multiple choice exams during the semester

Course: History of Veterinary Medicine

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	None
Course contents	At the beginning of their studies students are given an introduction to the development of veterinary medicine and the history of the veterinary profession. The relationship between humans and animals from prehistoric times to the present day is one of many topics discussed.
Test or examination	Oral exam at the end of the semester

Course: Career Opportunities for Veterinarians

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	None
Course contents	Introduction to the veterinary profession. An overview of the diverse possibilities and opportunities for the veterinary profession is discussed, as well as opportunities that are available in continuing and additional education. The role of the veterinary professional in public health, consumer protection, nutritional science, medical research, herd management and agriculture are also discussed.
Test or examination	Oral exam at the end of the semester

Course: Situs Demonstration I

Type of course	Seminar / 2 hours per week
ECTS credits	2.0
Prerequisite	Dissection I
Course contents	Demonstration of the organs, vessels, nerves and mesentery relationships of the abdominal, pelvic, and thoracic cavities of fresh cadavers in small groups. Demonstrations are performed on dogs (cats), parallel instructions in radiographic and ultrasound anatomy.
Test or examination	Several oral exams during the semester

Course: Ethology (Study of Animal Behaviour)

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	None
Course contents	Domestication of animals and the influence of domestication on behaviour, sensory perception of animals and their perception of pain, patterns of behaviour and the development of behaviour, ethological concepts in species appropriate behaviour and behaviour as a mechanism for meeting an animal's needs, methods of behaviour research, ethogram, socialisation, aggression, pecking order, territorial behaviour, sexual behaviour, behaviour of horses, cattle, pigs, poultry, dogs and cats, coping strategies, behaviour disorders, behaviour therapy.
Test or examination	Oral exam at the end of the semester

Course: Agricultural Sciences

Type of course	Lecture / 2 hours per week
ECTS credits	1.0
Prerequisite	None
Course contents	The purpose of and influences upon commercial husbandry; animal husbandry, performance, animal health; animal interactions with the environment; structure of the agricultural industry related to animal production; intensive and extensive husbandry systems; demands placed upon animal husbandry systems; husbandry and animal welfare; husbandry and environment; animal production and the agricultural ecosystem; evaluation of husbandry systems; criteria for assessing humane and environmentally sound animal production; basics of stall design; housing systems for dairy cows; combination of various aspects of husbandry (feeding, milking, sanitation); housing variations for growing cattle; range feeding; housing systems for pigs in all developmental stages; impact of husbandry and nutrition on growth, health, and meat quality; systems and conditions for raising sheep; raising poultry; organic animal production.
Test or examination	Oral exam at the end of the semester

Course: Animal breeding – Livestock Evaluation

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	None
Course contents	*Cattle:* breeds, purpose and uses, evaluation of breeding stock, evaluation of beef, and producing quality beef, practical aspects of breeding. *Horses:* organisation of performance evaluation tests, visit to Neustadt/-Dosse (stud-farm). *Pigs:* performance expectations in breeding, breeding, evaluation of breeds and breeding stock, evaluating pork. *Small ruminants:* ovine breeds, caprine breeds, breeding programmes for inconvenient population structures. *Poultry:* breeding and performance evaluation, evaluation of egg quality.
Test or examination	Oral exam at the end of the semester

Course: Animal breeding II

Type of course	Lecture / 2 hours per week
ECTS credits	3.0
Prerequisite	None
Course contents	*Cattle:* current issues in cattle breeding, breeding organisation, purpose of evaluation performance in cattle breeding, milk production, beef production, estimating breeding value of dairy cattle. *Horses:* horse breeds, performance and uses, estimating breeding value of riding horses and race horses, special heredity and market supported breeding. *Pigs:* geographic distribution, pig farming, pig mast, performance evaluation, estimation of breeding value, piglet production. *Small ruminants*: current status of breeding programmes in Germany, husbandry, performance, evaluating performance and breeding programmes. *Poultry:* geographic distribution, importance of poultry, breeds, chicks and raising chicks, laying hens, broilers.
Test or examination	Oral exam at the end of the semester

Course: Animal welfare I

Type of course	Lecture / 2 hours per week
ECTS credits	1.0
Prerequisite	None
Course contents	Ethical considerations in animal welfare with ethical ecological and environmental perspectives; current problems in animal welfare such as transport, marketing, improper breeding, hunting, zoos, and animal shelters; legal aspects of animal welfare focusing on the Tierschutzgesetz (animal protection law); ownership and transport regulations, adequate killing of animals, animal experiments; comparison of European animal welfare laws, special preservation regulations, Washington Species Preservation Treaty.
Test or examination	Oral exam at the end of the semester

Course: General Radiology incl. Physics of Radiation

Type of course	Lecture / 3 hours per week
ECTS credits	4.0
Prerequisite	None
Course contents	Classification of radiation (spontaneous ionisation, artificial, corpuscular, electromagnetic); physics of radiation (development and effect, dosage levels and units; methods of detection and measuring instruments); biological effect of radiation (effects on the cell, tissue, body, radiation syndrome, biological and chemical protection from radiation); contamination and incorporation of radionuclides (cycle of most important radionuclides, metabolism); use of contaminated animals and food; legislation concerning radiation protection; physics and technique of x-rays; techniques of radiographs, additional instruments; radio therapy; ultrasound diagnostics, techniques and use.
Test or examination	Oral exam at the end of the semester

Course: Botany II Toxic and Nutrient Plants

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	None
Course contents	Introduction to classification of plants and examples of pharmacological and toxicological usage of plants. The taxonomy of the most important plants and their families (about 600) is discussed in detail. Pteridophyta, Spermatophyta (incl. Coniferaphytina, Magnoliopsida and Liliopsida), Prokaryonta, Eukaryonta, Mycophyta are discussed. A field trip to the botanical gardens is also included.
Test or examination	Oral exam at the end of the semester

3rd Semester

Course: Anatomy II and Dissection II

ECTS credits 8.0

Anatomy II

Type of course	Lecture / 2 hours per week
Prerequisite	None
Course contents	Basically the same course contents as Anatomy I, except the emphasis is now placed on ruminants, horses and pigs.
Test or examination	Oral exam at the end of the semester

Dissection II

Type of course	Lab / 4 hours per week
Prerequisite	Dissection I
Course contents	Cutaneous muscles, muscles of the shoulder; neck: jugular groove with V. jugularis externa, A. carotis communis, Truncus vagosympathicus; Spatium colli with vessels and nerves, trachea and oesophagus; respiratory muscles, thoracic cavity, lung, vessels and nerves in the mediastinum; heart and pericardium; muscles of the abdominal wall and rectus sheath; study of the peritoneum and position of the abdominal organs; intrathoracic organs of the abdominal cavity: liver, stomach, pancreas and spleen; pelvis: inguinal rings, urinary organs, male and female reproductive organs; head: facial muscles, N. facialis, muscles of mastication, Nn. mandibularis, maxillaris, ophthalmicus, muscles and nerves of the eye; nasal cavity and sinuses; muscles of the soft palate and pharynx; guttural pouch, larynx, skeleton, muscles, nerves, brain and spinal cord. Dissection of the limbs: muscles, nerves, vessels and their terminal branches; fascia as a supporting structure and passive stay apparatus; dissection of unfixed toes; study of the equine hoof capsule and bovine claw.
Test or examination	4 oral exams during the semester covering the course content.

Course: Physiology I and Physiology Seminar

ECTS credits 6.0

Physiology I

Type of course Lecture / 4 hours per week

Prerequisite None

Course contents *Basics of cell physiology*: structure of cell membrane-channels, carrier, pumps.

Neuro-physiology: functional properties of neurons, resting potential, action potential, electrotonus, impulse conduction, transmitters, synapses, EPSP, IPSP, reflexes.

Vegetative nervous system: functions, general organisation and parts of the vegetative nervous system, sympathetic, parasympathetic, transmitters, receptors, effects on organs and metabolism, enteric nervous system, vegetative spinal reflexes, vegetative functions of Medulla oblongata, hypothalamus and limbic system.

Muscles: organisation, the Ratchet Theory of contraction, types of muscle contraction, electromechanical/electrochemical coupling, motor unit, resting tension curve, isotonic/isometric maxima;

Properties of smooth muscle: myogenic excitation, plasticity, multi-unit/single-unit type smooth muscle.

Heart: organisation, coronary circulation, impulse generation and conduction as well as disturbances, electromechanic coupling, vegetative influence, Frank-Stirling-mechanism, phases of action, heart sounds, volumes, pressure-volume diagram, EKG, embryonic heart.

Circulatory system: organisation, physical laws applied to circulation, pulse, elasticity of vessels, micro-circulation and trans-capillary exchange, local and nerval regulation of blood flow, regulation of blood pressure.

Blood: blood volume, blood loss, blood plasma and contents, hematopoiesis, erythrocyte indices, haematocrit, haemoglobin and indices, blood groups, anaemia, blood transfusion, polycythaemia, rheology and blood viscosity, leukocyte picture and count, nuclear shift, recruiting of granulocytes incl. phagocytosis and apoptosis, haemostasis incl. thrombocyte function, plasmatic coagulation factors and fibrinolysis, status of coagulation.

Respiration: respiration and ventilation, diffusion, perfusion and distribution, mechanism of inspiration and expiration, respiratory regulation, volume and capacities of respiration, elastic airway resistance incl. surfactant and compliance, viscous airway resistance, obstruction, pulmonary function incl. blood gas analysis, gas transportation in blood, CO_2 transport and effect of carbonic anhydrase, barrier and defence mechanism of the lungs incl. clearance, thermo-regulation and dead space (panting), metabolic lung function.

Gastro-Intestinal-Tract: regulation and autonomic nervous system, endocrine system and immune system, GI-tract secretion towards salivary glands, gastric glands, and exogenous pancreas and bile system, digestion and absorption in monogastric animals, intestinal absorption and secretion, digestion and absorption in new-born with transfer of colostrum antibodies, osmotic and secretory diarrhoea, fermentation, fore-stomach motility and luminal milieu, age dependent development of fore-stomachs and reflex of the reticular groove, digestion in the large intestine (horse), obstipation.

Test or examination Oral exam at the end of the semester

Physiology Seminar

Type of course Seminar / 0.5 hours per week

Prerequisite None

Course contents Cell and neuro-physiology, muscles, heart and circulatory system, respiration, blood.

Test or examination Oral exam at the end of the semester

Course: Biochemistry I and Biochemistry Lab I

ECTS credits 8.0

Biochemistry I

Type of course Lecture / 4 hours per week

Prerequisite None

Course contents *Amino Acids, Peptides, and Proteins:* structures and function, metabolism of amino acids (transamination, desamination, decarboxylation, urea cycle). *Enzymes:* classification; structure and function; examples for catalytic mechanisms, kinetic of Michaelis-Menten-enzymes. *Carbohydrates:* structure, prevalence and function of monosaccharides and their derivatives, oligo and poly saccharides, proteoglykanes and glycoproteins. Glucose metabolism (glycolysis, gluconeogenesis, pentophosphate pathway). Glycogen metabolism (glycogenesis; glycogenolysis). Metabolism of fructose and galactose. *Lipids:* structure, prevalence and function of simple and complex lipids and eicosanoides. Metabolism of fatty acids and triacylglycerine (ß-oxidation, de-novo synthesis; ketogenesis, ketolysis; propionate metabolism; lipolysis; lipogenesis). *Biochemistry of nutrients:* digestion and absorption of alimentary protein, carbohydrate and lipids in omnivores and ruminants. *Biological Oxidation:* Citric acid cycle. Internal respiration (electron transport chain, proton translocation, oxidative phosphorylation).

Test or examination Oral exam at the end of the semester

Biochemistry Lab

Type of course	Lab / 3 hours per week
Prerequisite	Successful completion of chemistry lab
Course contents	*Proteins:* determination of arginase activity in the liver, determination of free amino acids in blood. Digestion of proteins: pH dependency of the entero-protease trypsin. *Enzymes:* 1. separation of LDH iso-enzymes with elec-trophoresis on agarose gel, 2. determination of lactate dehydrogenase accumulation in skeletal muscle extract and purified fraction. *Carbohydrates:* 1.isolation of glycogen from the liver: acid hydrolyisis and detection of glucose, 2. determination glucose-6-phosphate-phosphatatse in liver extract. *Lipids:* 1. enzymatic determination of D-3-hydroxybutyrate in blood, 2. enzymatic digestion of triacylglycerin with pancreas lipase, deter-mination of the peroxide number of a fat. *Biological Oxidation:* 1. isolation of mitochondria from the cardiac muscle and measurement of succinate-dehydrogenase activity, 2. measurement of the absorption spectra of oxi-dised and reduced cytochrome-c, 3. examination of cytochrome-c-oxidase. *Nucleic Acids:* 1. isolation of nucleic acids, 2. cutting of DNA with restriction enzymes, 3. gel-electrophoresis, 4. photometrical determination of DNA. *Hormones / Vitamins:* 1. measurement of beta-carotene levels in alfalfa feed, 2. investigation of the hormonal regulation of blood glucose levels.
Test or examination	4 oral exams during the semester

Course: Animal Feed Science

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achieve-ment
Course contents	Classification and evaluation of feedstuffs, basic physiology of nutrition, minerals, vitamins, energy, proteins, amino acids
Test or examination	Oral exam at the end of the semester

4th Semester

Course: Situs Demonstration II

Type of course	Seminar / 2 hours per week
ECTS credits	2.0
Prerequisite	Dissection II
Course contents	Situs demonstration of the abdominal and pelvic cavity of the horse, small ruminants, pig, birds and companion animals.
Test or examination	Several oral exams during the semester

Course: Embryology

Type of course	Lecture / 1 hour per week
ECTS credits	1.5
Prerequisite	Successful completion of Anatomy I and II
Course contents	*General:* The role of embryology in science and history; phylogenesis, pro-genesis, ontogenesis incl. post-natal development. *Pre-development:* gonads and gametes, organisation of egg and sperm cells, gamatogenesis. *Reproductive Cycle:* biological definitions, differences in the sexual organs and rhythms between humans and animals. *Fertilisation:* definition, phases, morphology, location of fertilisation, prim-itive development, cleavage, blastula, blastocyst, gastrulation, determina-tion, induction processes. *Primitive Organs:* chorda, neural tube, somites, primitive gut, branchial arch, body form. *Organ genesis:* GI-tract, urogenital apparatus, respiratory apparatus, loco-motor apparatus, CNS, heart and vessels, face. Foetal membranes: amnion, chorion, allantois, yolk sack, umbilical chord. Implantation and placentation. *Placentation:* macroscopic and microscopic classification and morphology of placentas in experimental embryology, cloning, gene-transfer.
Test or examination	Oral exam at the end of the semester

Course: Histology II and Histological Lab II

ECTS credits 4.0

Histology II

Type of course Lecture / 1 hour per week

Prerequisite Histology I

Course contents *Digestive system:* oral cavity, tongue, teeth, salivary glands, pharynx, oesophagus, stomach, duodenum, jejunum, caecum, colon, rectum, anus, anal sacks;
Accessory glands: liver and gallbladder, pancreas and pancreatic islands.
Respiratory system: nasal cavity, larynx, trachea, lungs.
Urinary system: kidney, lower urinary tract (renal pelvis, ureter, urinary bladder, urethra).
Male reproductive system: testis (spermiogenesis), epididymis, Ductus deferens, Glandula vesiculosa, prostate, Glandula bulbourethralis, penis.
Female reproductive system: ovary (ovagenesis), Tuba uterina, uterus, vagina, Vestibulum vaginae, vulva.
Endocrine system, sensory organs, central nervous system (CNS).

Test or examination Oral exam at the end of the semester

Histology Lab II

Type of course Lab / 2 hours per week

Prerequisite Histology Lab I

Course contents *Digestive system:* lips, tongue, palate, teeth, salivary glands, oesophagus, fore-stomach, stomach, small intestine, large intestine, anus, liver, gallbladder, pancreas.
Respiratory system: trachea, lung.
Urinary system: kidney, ureter.
Male and female reproductive organs.
Endocrine system: pituitary gland, thyroid, adrenal glands, CNS, sensory organs.

Test or examination Oral exam at the end of the semester

Course: Physiology II and Physiology Lab

ECTS credits 8.0

Physiology II

Type of course Lecture / 3 hours per week

Prerequisite None

Course contents *Energy metabolism:* definition, energy source food, physical and physiological combustion values, gross-, net-, digestible-, metabolic-energy, energy balance, direct and indirect calorimetrics, RQ, caloric equivalent, conversion, Kleiber formula, energy conversion (resting and production requirements)
Thermo-regulation: homoithermic and polikothermic animals; core and surface temperature; normal, hyper, and hypothermia; neutral thermic zone; physical and chemical temperature regulation; temperature regulation through behaviour; thermal receptors; central integration of the hypothalamus; fever.
CNS: muscle spindles, Y-neurons, reflex tonus, reciprocal innervation, voluntary motor functions, motoric centres, neural pathways.
Pain: nociception, pain conduction, pain processing, modulation by CNS, reception and processing of pain in animals, elimination of pain.
Kidney: function, organisation of nephrone, primary urine, renal auto-regulation, juxtaglomerular apparatus, clearance, osmotic gradients, water reabsorption, counter current exchange, mechanisms of absorption and secretion; ADH, aldosterone.
Water balance: distribution of body water, regulation of osmotic pressure and volume, osmotic receptors, ADH, thirst, renin-angiotensin-aldosterone system, ANP, electrolyte and water balance disorders.
Acid-base regulation: pH value, buffering system, Henderson-Hasselbalch equation, acidosis / alkalosis, renal and pulmonary regulation of acid-base status.
Sensory physiology: sensation and perception; minimal and relative thresholds; perception in animal and human; facial, auditory, vestibular, gustatory, and olfactory senses.
Integrative physiology: physiology of the racehorse, physiology of the high yield dairy cow.
Organism-environment-relationship (stress): mechanisms of regulation and dysregulation, adaptation, compensation and decompensation, stress-concept, eustress, distress, stress factors in animal husbandry, stress-answer-reaction.

Test or examination Oral exam at the end of the semester

Physiology Lab

Type of course	Lab / 2.5 hours per week
Prerequisite	Successful completion of Physic Lab, Dissection I and Histology I
Course contents	Epithelial transport, basics of cell and electro-physiology; red and white blood profile, determination of blood groups in dogs and humans, coagulation status, respiratory and blood gas analysis (dog and human), spirometer, impulse generation and impulse conduction in the heart, EKG in animals and humans; energy metabolism, skeletal muscle, smooth muscle, fore-stomach system of ruminants, sensory physiology.
Test or examination	A short oral exam is given at the beginning and end of each lab

Course: Biochemistry II

Type of course	Lecture / 3 hours per week
ECTS credits	6.0
Prerequisite	None
Course contents	*Nucleic acids:* structure and significance of nucleic acids, DNA, RNA, nucleoproteins. *Gene expression:* transcription (course, steps, processing for primary transcripts) *Translation:* aminoacetylation of tRNA; steps; posttranslational modification), regulation of gene expression in prokaryotic and eukaryotic cells, principles of genetic technology. *Endocrinology:* hormones as chemical signals. Mechanism of signal transduction in hormone and nuclear receptors (hormone response element; ligand-dependent transcription regulation), structure, biosynthesis, biological effects, mechanisms of action. Regulation of hormone secretion of hypothalamus, pituitary, adrenal cortex, adrenal medulla, Pancreas, thyroid, parathyroid and gonads. *Fat soluble vitamins:* structure, prevalence, absorption, effects, mechanisms of action, deficiency symptoms.
Test or examination	Oral exams at the end of the semester

Course: Food Science Lab

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Weender feedstuff analysis, grains and products of processing, leguminous plants, oilseeds and side products of oil extraction, side products of fermentation, fruit processing and sugar industry, fields and pastures, conservation of feedstuffs, hay, silage, feedstuff of animal origin, fishmeal, animal meal, milk and milk processing products, mixed feed composition. Microscopy of feedstuffs.
Test or examination	2 oral exams (food science and microscopy)

Course: Clinical Propaedeutic

Type of course	Lab / 7 hours per week (groups alternate with the equine, buiatric, reproductive, and small animal clinic)
ECTS credits	6.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*Equine clinic:* Working with horses; tools used for restraining, leading and controlling horses; physical examination procedure: clinical history, signalement, general examination, status praesens, mucous membranes, skin, subcutis, lymph nodes (independent examination and evaluation); special examination of different organ systems: cardiovascular system incl. ECG, blood pressure, respiratory system incl. endoscopy, percussion and auscultation exercise, thorax examination, thoracocentesis, digestive system, oesophagus and stomach tube, oesophago-gastroscopy, rectal examination, abdominocentesis, faeces examination, urological examination, urine collection and examination, neurological examination, cerebrospinal fluid puncture, examination of the limbs, exterior, stance, diagnosis of lameness, flexion test, diagnostic injection, locomotor system, examination of the back; evaluation of findings and written report. *Small animal clinic:* Taking a medical history and performing a clinical examination; Restraint of dogs, cats, and companion animals; Independent practical examination and evaluation of body temperature, skin and coat, superficial lymph nodes, lymph nodes, bone marrow aspiration, ear, eye, oral cavity, pharynx, larynx, oesophagus, stomach, intestines and perineum, locomotor system, nervous system, male and female urogenital system, cardiovascular system, respiratory system, infections and infusions; performing

exercises in neurological examination, otoscopy, auscultation, applying bandages etc.; introduction to the most common medical instruments and examination techniques; breed identification; companion animals.

Reproductive clinic:
Introduction to the recognition of clinical signs, using general and specialised examination techniques; performing a gynaecological, obstretic and andrological examination, examination of the mammary glands and examination of a new-born animal (comparative examples, mainly consisting of large and small ruminants).

Buiatric clinic:
1. introduction to clinical bovine medicine and physical exam,
2. restraint,
3. signalement, age estimation,
4. examination of the skin, mucus membranes and lymphatic system,
5. examination of the respiratory system,
6. examination of the cardiovascular system, injections and drawing blood,
7. examination of the digestive system, incl. obtaining and evaluating rumen contents,
8. examination of the urogential system,
9. examination of the locomotor system,
10. examination of the CNS,
11. evaluation of the findings and written report.

Pigs:
1. introduction to porcine medicine under clinic and field conditions,
2. signalement, restraint,
3. examination of skin, the circulatory system and respiratory system,
4. examination of the male and female urogenital system,
5. findings during pregnancy, birth and lactation,
6. examination of the locomotor system,
7. neurological examination,
8. drawing blood,
9. application of drugs.

Test or examination Oral test

5th Semester

Course: Animal and Environmental Hygiene I and II

ECTS credits 3.0

Animal and Environmental Hygiene I

Type of course Lecture / 2 hours per week
Prerequisite Successful completion of the pre-clinical boards or comparable achievement
Course contents *Environmental hygiene:* Emission and immission; general prevention of infectious disease, antimicrobial regiments and quarantines, sterilisation, disinfecting and deinfesting; feedstuffs and feed hygiene, drinking and trough water; manure and liquid waste disposal; waste water processing; carcass disposal and processing; transport hygiene.
Test or examination Oral exam at the end of the semester

Animal and Environmental Hygiene II

Type of course Lecture / 2 hours per week
Prerequisite Successful completion of the pre-clinical boards or comparable achievement
Course contents *Animal hygiene:* Animal husbandry and welfare; environmental factors, animal health and performance; heat production and regulation in animal housing; air temperature, humidity, and ventilation; air pollution (dust, gas, microbes, endotoxins); ventilation and ventilating systems; light and noise; measuring of stall climate; hygiene in raising cattle, pigs, poultry, horses, sheep, cats, and dogs.
Test or examination Oral exam at the end of the semester

Course: Animal Nutrition

Type of course Lecture / 2 hours per week
ECTS credits 2.0
Prerequisite Successful completion of the pre-clinical boards or comparable achievement
Course contents Food consumption and regulation; nutrients digestibility and methods of measuring digestibility; energy conversion and methods for measuring; protein evaluation and amino acid requirements, protein deficiency and excess; minerals and vitamins: sources, function, bio-availability, deficiency disease, toxicity; method of action of feed additives; Basics of nutrient physiology and performance indices, energy and nutrient requirements, feeding praxis as well as nutritional based disease and relevant mistakes in diets of ruminants, pigs, horses, poultry, dog and cat, companion animals, fish and ornamental fish.
Test or examination Oral exam at the end of the semester

Course: Pharmacology and Toxicology I

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*General Pharmacology:* Properties of drugs and medication: pKa value, molecular weights, isomers, bonding properties, receptor and internal signalling, application methods and formulations, dose and dosing, dose-effect relationship, side effects and toxic effects; pharmaco-kinetics, absorption of drugs and factors that influence absorption, protein binding and distribution of drugs, compartments; elimination: excretion, biotransformation and influencing factors; possible consequences of repeated application (tolerance, resistance, addiction, allergy, accumulation etc.); pharmaco-genetics (variations between the species). *Special Pharmacology:* Pharmacology of the vegetative nervous system, muscle relaxants; pharmacology of the central nervous system (narcotics, analgesics, sedatives, hypnotics, neuroleptics); local anaesthetics; pharmacology of the cardiovascular system, blood, plasma expanders, water and ion balance, kidney and respiratory organs, digestive organs, reproductive organs, hormones and vitamins, inflammation; chemotherapeutic agents; antibiotics; antiparasitics, antimycotics, disinfectants and antiseptics. *Toxicology:* Principles of treating intoxication, heavy metals, poisonous plants, carbon-hydrate, fertiliser, insecticides, rodenticides, toxic gasses, testing of toxicity.
Test or examination	Oral exam at the end of the semester

Course: Pharmacology and Toxicology

Type of course	Seminar / 2 hours per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 5th semester
Test or examination	Oral exam at the end of the semester

Course: Parasitology

Type of course	Lecture / 3 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*General parasitology:* parasite, parasitism, damaging effects, immune response. *Special parasitology:* helminthology, protozoology, entomology; morphology, biology and therapy of trematodes, cestodes and nematodes as well as flagellates, sporozoa, piroplamida and parasitic arthropodes.
Test or examination	Oral exam at the end of the semester

Course: Virology I

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Introduction to virology and an introduction to virological literature; organisation and taxonomy of viruses; replication strategies of DNA viruses; replication strategies of RNA viruses; purpose of animal experiments, the embryonic egg and cell culture as a medium for viral culturing and characterisation; biological properties of viruses (transformation, persistence, latency); biochemical properties of viruses, immune response to viral infection (cellular, humoral); the most important parameters for veterinary diagnosis of viral infection; viral infections of the skin; viral infections of the respiratory system; viral infections of the digestive system; congenital viral infections; viral infections of the nervous system (conventional and “unconventional” viruses); vaccination and its importance; epidemics of viral diseases; relevant viral infections of wild animals.
Test or examination	Oral exam at the end of the semester

Course: General Immunology

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	none
Course contents	Importance of the subject immunology, defence in evolution, central importance of "foreign" and "own"; Classification of the subject (inborn, acquired, cellular and humoral components), physical and chemical barriers, complement system, co-operation of inborn and acquired defence components; Haematopoetic system, myeloic and lymphatic row, phagocytic system, monocyte, macrophages, granulocytes, cluster of differentiation (CD nomenclature); MHC complex, HLA- polymorphism, MHC and diseases, structure of MHC class I and class II proteins: Antigens, antigen-processing, antigen presentation, T-cell receptor, Co-stimulation, cytokines; Development of T-lymphocytes (sub-population Th1, Th2, Tc), variety of receptors (diversity), development of tolerance, thymus; Cytotoxic defence; Development of B-lymphocytes, B-cell receptor, receptor or anti body diversity, tolerance mechanisms, unresponsiveness; Humoral defence ("antigen response"), anti bodies (synthesis, structure, function), receptors for anti bodies, effector cells; Mucosal defence.
Test or examination	Oral exam at the end of the semester

Course: Principles of Infectious Diseases and Epidemiology

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Principles of infectious diseases and Epidemiology: ecology of the interaction between host and pathogen, infection, infection chain vectors; principles of disinfection / sterilisation and elimination of pathogens by physical and chemical means; Principles, tasks, and aims of Epidemiology.
Test or examination	Oral exam at the end of the semester

Course: General Pathology including exercises

Type of course	Lecture and exercise / 4 hours per week
ECTS credits	3.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Introduction and general etiology, birth defects, disorders of circulation, regressive and progressive changes, inflammation, immune-pathology, oncology, death.
Test or examination	Oral exam or written test with histological sections at the end of the semester

Course: Laboratory Medicine Lab

Type of course	Lab / 2 hours per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards (Physikum)
Course contents	Introduction, literature recommendations, diagnostic material, control of correctness; urinary excretion of serum substances; urea, creatinine, renal function test, water and electrolyte status; urinary analysis in small animals; haematology (coagulation); practical exercise on haematology / micro-haematocrit, leukocyte count, blood smear, functional diagnosis of endocrinopathies (with examples); acid-base-status: theory and practical exercises; Instrument demonstration (haematology / clinical chemistry), liver diagnostics; serum protein / serum lipids, liquor; pancreatic diagnostic (glc-determination, faecal digestion); cytology; urinary analysis in horses / cytology in horses (tracheal wash); companion animals and exotics
Test or examination	Written test at the end of the semester

Course: Animal Reproduction I

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Principles of animal reproduction; neuro-hormonal regulation of the reproductive system; basics of hormone therapy (all species); reproductive physiology of the female cow; gynaecological examination; oestrus diagnostics; pregnancy diagnostics ; reproductive disorders of the cow; diseases of the genitals; venereal disease and infectious causes of embryonic death and abortion; disorders of the reproductive cycle; herd based reproductive monitoring; herd management. http://www.gynvorlesung.de
Test or examination	Oral exam at the end of the semester

Course: Animal Reproduction Exercise

Type of course	Exercise / 4 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Gynaecological, obstretic, and andrological examination of different species; vaginal and rectal examination, emphasis on ovaries; conservative and surgical obstretic actions; neonatal care; puerperal monitoring; obtaining and preservation of semen; artificial insemination; detection of pregnancy; introduction to ultrasound diagnostics (esp. ovaries and pregnancy detection); clinical examination of the udder; performing teat operations; demonstration of uteruses and ovaries from slaughtered animals.
Test or examination	Oral exam at the end of the semester

Course: General Surgery

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	1. wounds: types of wounds, wound pain, haemorrhage and haemostasis, wound treatment, wound healing, suture techniques, plastic, transplantation, wound infection, chemotherapy, infections; 2. covered injury of the skin, muscle and tendons: tendon disease, tendon rupture, tendinitis; 3. bones: bone fracture, classification of fractures, examination, fracture healing, therapy, factors influencing fracture healing, osteoporosis, atrophy; 4. joints: arthritis, arthrosis, joint injuries, treatment of different joint injuries; 5. skeleton: development, metabolic skeletal disease, developmental disorders; 6. hernias; 7. abdominal surgery: intestinal sutures, intestinal resection.
Test or examination	Oral exam at the end of the semester

Course: Medical and Surgical Diseases of Ruminants I

Type of course	Lecture/ 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Disorders of mineral status, carbohydrate, lipid, and energy metabolism, vitamin status, trace element status, introduction to herd management, infectious diseases including several organ systems, infectious diseases with systemic effect, respiratory diseases
Test or examination	Oral exam at the end of the semester

6th Semester

Course: Animal Welfare II

Type of course	Seminar / 2 hours per week
ECTS credits	3.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Students independently develop concepts for problems concerning the ethics of animal welfare, appropriate husbandry of farm, companion animals, of animal transport and marketing, of the reasons and adequate killing of animals, of animal experiments, torture breeds and of production required interventions.
Test or examination	Oral exam at the end of the semester

Course: Lab Animal Medicine and Disease

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*Laboratory animals:* animal experiments, research freedom, ethical questions in animal experiments; legal aspects, approval and monitoring of animal experiments; influential factors in animal experiments; factors, animals, environment, experiment; gnotobiot, gnotobiotop, gnotobiostasis, genetic standardisation, genetic control; transgenic animals; basics of molecular biology, constructing transgenic animals, abiotic environment of laboratory animals; climate, temperature, humidity, ventilation, light, acoustics, nutrition and diet components; optimising of animal experiments; alternatives to animal experiments.
Test or examination	Oral exam at the end of the semester

Course: Animal Nutrition Lab

Type of course	Lab / 2 hours per week
ECTS credits	3.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Principles of constructing and calculating a ration; ration calculation with the help of commercial feeding programmes for companion and farm animals; calculation of a mixed ration for ruminants, pigs, horses, dogs, and cats; dietary measures for treating metabolic diseases and convalescent animals.
Test or examination	4 tests (ration calculation and evaluation for ruminants, carnivores, pigs, and horses)

Course: Pharmacology and Toxicology II

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 5th semester
Test or examination	Oral exam at the end of the semester

Course: Virology II

Type of course	Lecture / 0.5 hours per week
ECTS credits	0.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Introduction to the viral families: Pox-viridae, Iridoviridae (African hog cholera), Herpesviridae (animal, human), Papovaviridae, Parvoviridae, Orthomyxoviridae; Paramyxoviridae, Retroviridae, Rhabdoviridae, Bornaviridae, Coronaviridae, Reoviridae, Picornaviridae; "unconventional" virus infection in animal and human (Scrapie, BSE, CJD, nCJD); vaccination, immunisation strategies, conventional and biotechnological methods of vaccine development and production.
Test or examination	Oral exam at the end of the semester

Course: Special Immunology

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	none
Course contents	Monoclonal antibodies, use in diagnostics and therapy, humanised anti bodies, genetically engineered antibodies Vaccination in veterinary medicine, modern vaccines (e.g. genetically engineered), adjuvant (which kind exist, how do they function, which problems occur?), time of vaccination; auto-immune disorders in companion and farm animals; hypersensitivity (allergies, immune-complex-diseases, asthma); immune suppression, escape mechanism, AIDS in humans and animals
Test or examination	Written exam at the end of the semester

Course: General Bacteriology and Mycology and Special Bacteriology and Mycology

ECTS credits	1.5

General Bacteriology and Mycology

Type of course	Lecture / 1 hour per week
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Morphology and fine cytology of bacteria; selected topics in bacterial genetics (horizontal gene transfer, mobile gene elements, basics of genotyping bacteria); bacterial culture and metabolism; bacterial ecology (antibiotics, bactericides); bacteriophages and lysotypes; systematic and taxonomy of bacteria; morphology and systematic of fungi relevant to veterinary medicine, mycotoxins; pathogenic factors in bacteria and fungi, bacterial toxins; bacterial mechanisms towards resistance against anti-infectious drugs
Test or examination	Oral exam at the end of the semester

Special Bacteriology and Mycology

Type of course	Lecture / 0.5 hours per week
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Infection caused by members of the following families: Micrococcaceae, Streptococcaceae, Neisseriaceae, Pseudomonadaceae, Enterobacteriaceae, Vibrionaceae, Bacteroidaceae, Spirochaetaceae, Spirillaceae, Bacillaceae, Mycobacteriaceae, Nocardiceae, Streptomycetaceae, Pasteurellaceae and the genera Acinetobacter, Brucella, Bordetela, Francisela, Listeria, Erysipelothrix, Moraxella, Corynebacterium, and the order Rickettsiales and Chlamydiales, representatives of mycoplasma, hyphomycetes are also discussed.
Test or examination	Oral exam at the end of the semester

Course: Bee Diseases

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Viral, bacterial, and parasitic diseases of the bee.
Test or examination	Oral exam at the end of the semester

Course: Fish Diseases

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Fish husbandry:* aquaculture of trout and carp, mariculture, ornamental fish (aquariums, garden pond). *Diagnostics of fish disease:* history, clinical examination, laboratory methods, necropsy, and water quality control. *Diseases:* infectious diseases in Europe (viral, bacterial, parasitic), diseases caused by poor husbandry (nutrition, water quality), therapy. Legal aspects (animal welfare, prescriptions / pharmaceuticals, fish epidemic laws).
Test or examination	Oral exam at the end of the semester

Course: Special Pathology I including Exercises

Type of course	Lecture and exercises / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Cardiovascular system, respiratory system, haematopoietic organs, digestive system, liver and pancreas, urinary system, genital system, udder, locomotor system, CNS, pathological growth, endocrine system.
Test or examination	Oral exam or written test with histological sections at the end of the semester

Course: Reproduction II (Andrology)

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Endocrine regulation of sexual function of male animals. Andrological examination of sires in respect to current, hereditary, and genital health. Diagnosis, evaluation, and treatment of disorders in this complex. Monitoring sires in respect to use for artificial insemination. Collection, preservation, and transfer of semen. Use of biotechnology in animal production. All subjects are discussed by comparison between the species.
Test or examination	Oral exam at the end of the semester

Course: Clinical Radiology within Surgery

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Qualities and categorisation of radiation (ionising, artificial, corpuscular, electromagnetic); light physics (origin and activity, units of measurement, instruments of measure); biological aspects of radiation (effects on cells, tissues, organism, radiation syndrome, chemical safety); question of contamination and incorporation of radioactive markers (bio-cycles of important radioactive substances, metabolism uses); using radiation contaminated animals and food; legal aspects of radiation; X-ray physics and technology; taking radiographs, additional technology; radiation therapy, ultrasound techniques and uses.
Test or examination	Oral exam at the end of the semester

Course: Medical and Surgical Diseases of the Horse I

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*Hoof:* anatomy, hoof mechanism, horn growth, correct shoeing, hoof form and shoeing, limb positioning, nail placement and incorrect nail placement, alternative shoeing, thrush, chronic infection of the hoof wall, hoof wall avulsion, hoof wall defect, clubbed hoof, contracted heels, toe cracks, cylindrical ceratoma, pododermatitis, hoof cancer, laminitis, navicular disease, tendinitis, osteochondrosis dissicans, tarsitis. Medical diseases: introduction to the basics of diagnosis and therapy, diseases of the liver metabolism, intoxication, endocrine disorders, disease of the kidney and urinary tract, diseases of the muscles, blood, skin, and nervous system, infectious and parasitic diseases.
Test or examination	Oral exam at the end of the semester

Course: Medical and Surgical Diseases of Ruminants II

Type of course	Lecture / 2 hours per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Diseases of the digestive system including liver and bile system, cardiovascular diseases, diseases of the locomotion, diseases of the nervous system, eye diseases.
Test or examination	Oral exam with patient at the end of the 9th semester (second section of the veterinary boards)

Course: Medical and Surgical Diseases of the Pig

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Diseases of the muscles, limbs, and skeleton; surgical diseases of the digestive tract and abdomen; diseases of the CNS; diseases of the urinary tract, skin diseases, cardiovascular diseases, and blood diseases, gastrointestinal diseases I and II, respiratory diseases I and II, febrile diseases (enzootic), febrile diseases (epidemic), protection from herd infection, managing herd health.
Test or examination	Oral exam at the end of the semester

Course: Diseases of Small Animals I

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Introduction to internal medicine, diagnosis and therapy; infectious diseases, respiratory diseases, skin and ear diseases, thoracic trauma and exsudate, gastrointestinal, hepatic, and pancreatic diseases, endocrinology, bone, joint, and muscle diseases, disorders of the central and peripheral nervous system, disease of the heart and circulatory system, immune mediated diseases, diseases of the kidney and lower urinary tract; disease of companion animals and exotics; shock, infusion therapy, dental diseases, acute abdomen, oncology, haematological diseases.
Test or examination	Oral exam at the end of the semester

Course: General Food Hygiene

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Microbiology of food; industrial hygiene.
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration I (Equine Clinic)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement, propaedeutic
Course contents	Students present patients after independent examination, detailed diagnosis and applied therapy in front of a small group. Based on the course contents of propaedeutic and special examinations as radiographs, endoscope and ultrasound examination, EKG, function of organs, body cavities, biopsies. Basics of pathogenesis, therapy and prognosis.
Test or examination	Written report

Course: Clinical Demonstration I (Buiatric and Reproduction Clinic) + Group Exercises (Buiatric Clinic)

Type of course	Demonstration / 3 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*Buiatric:* Presentation of patients (large and small ruminants, pigs) with internal and surgical diseases of infectious or non-infectious etiology; diagnosing patients with the use of conventional or modern clinical methods, clinical chemistry and clinical technology (ultrasound, radiographs, and endoscope); formulation of a diagnosis and exclusion of differential diagnosis; planning therapy, treating individual patients and apply findings obtained from a single animal to an entire herd; development of prophylactic, metaphylactic and therapeutic treatment strategies for a herd. *Group instructions:* Presentation of individual patients with internal or surgical diseases, detailed examination, listing of clinical findings and treatment in small groups. *Reproduction:* Presentation, examination and discussion of patients (mainly cattle and horses, less frequently pigs, companion animals) with: Gynaecological and obstretic problems; diseases or disorders of the mammary gland; neonatal or andrological problems. Special diagnostic measures and therapies incl. surgery are also performed (C-section, teat operations, castration, penis repositioning) in addition to the use of biotechnology. Presentation, examination and discussion of animals in the context of udder health and breeding stock.
Test or examination	Oral exam with patient at the end of the semester

Course: Clinical Demonstration I (Small Animal Clinic)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement, propaedeutic
Course contents	Demonstration of patients with internal, dermatologic, surgical, ophthalmologic or orthopaedic diseases, dependent on availability; diagnosis based on the course contents of propaedeutic, basics of pathogenesis, therapy and prognosis. Practical exercise and application of theoretical knowledge instructed in small groups (participation in clinic work 4 to 8 hours per semester minimum): inpatient and outpatient therapy, internal medicine, surgery, anaesthesia, cardiology, dermatology, ophthalmology.
Test or examination	Oral exam at the end of the semester

7th Semester

Course: Pharmacotherapy and Regulatory Issues (AVO)

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	*Legislation:* laws and regulations involving the use and commerce of pharmaceuticals; laws concerning rules for the use of pharmaceuticals in food and feedstuff within the veterinary sector; laws concerning controlled substances (BtM). Formulation of normal and controlled substances and prescription of food pharmaceutical additives. Exercises in prescription under consideration of selected topics of pharmacology: pharmacotherapy of circulatory diseases, inflammation, respiratory diseases, gastrointestinal diseases, skin diseases. Therapy of intoxication.
Test or examination	Oral and written (writing of 3 prescriptions) exam

Course: Compounding Lab

Type of course	Lab / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Calculation of medication prices in accordance with pricing regulations for pharmacists; orderly labelling of pharmaceuticals; theoretical basics concerning different forms of medication, pharmaceutical work, basic rules to guarantee good medication quality, principles for compounding of powders, solutions, suspensions, emulsions, and salves; adjuvants for preparation of different pharmaceuticals, dilution of pharmaceuticals, compounding of powders, solutions, suspensions, emulsions and salves.
Test or examination	Written (labelling and price calculation of 2 prescriptions) exam at the end of the semester Practical exam (compounding of 2 pharmaceuticals) at the end of the semester

Course: Parasitology Lab

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Testing for the presence of parasites in the faeces of livestock and companion animals; identifying larvae of pathogenic nematodes; staining methods to test for parasites in blood and tissue; macroscopic and microscopic differentiation of parasites.
Test or examination	Oral exam at the end of the semester

Course: Virology Lab

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Dealing with viruses, mechanisms of transmission, obtaining of samples concerning different viral infections, clinical history, creation of cell cultures, passaging of cells, freezing and reculturing of viruses, virus test, plaque-focus test and demonstration, neutralisation test, IFA, ELISA, demonstration and independent evaluation of CPEs, serological tests, HA, HAH, cell-ELISA, RT-PCR, PCR, nested PCR, REA, hybridisation (in situ), usage of monoclonal antibodies.
Test or examination	Final colloquium with practical assignment

Course: Microbiology Lab

Type of course	Lab / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Safety precautions when working with infectious agents; obtaining and packaging samples for bacterial examination. Performing a bacterial examination, including an anti-biogram of an isolated pathogen. Microscopy in bacteriology, techniques and goals of examination of bacterial cultures; microscopic presentation and culturing of the most important bacteria genera for veterinary medicine; molecular biological detection of bacteria via polymerase chain reaction and DNA-DNA-hybridisation; precipitation reactions used to identify group specific polysaccharide antigens of streptococcus; identifying enterobacteriacae using biochemical methods; using polyvalent sera to confirm suspicion of the presence of salmonella; phagotyping salmonella; microscopy of the fungi that are most relevant to veterinary medicine with special attention given to identifying the reproductive apparatus of a fungus; culture of fungi; molecular biological methods for the typing of pathogenic bacteria, molecular detection of virulence.
Test or examination	Final colloquium with practical assignment

Course: Epidemic control I

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	History of the Federal control of animal diseases; legislation procedures: national /European Union (EU); Organisation, duties and function of the German Veterinary Authorities; participation of customs and Federal Border Police, epidemiological principles of epidemic control, disease notice and report; measures against national epidemic dangers; cleaning, disinfecting, pest control, methods to control special epidemic diseases (Tbc, ParaTbc, Psittacosis, anthrax) and against BSE.
Test or examination	Written test at the end of the semester

Course: Special Pathology II including Exercises

Type of course	Lecture and exercises / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam or written test with histological sections at the end of the semester

Course: Diseases of Small Animal II

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam at the end of the semester

Course: Obstretics

Type of course	Lecture / 1 hour per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Lectures on the subject of pregnancy, obstretics, and neonatology are discussed on the cow and compared to dogs, horses, pigs, and small ruminants. The following topics are discussed: gynaecological (obstretic) exam, placenta, pregnancy, birth, disorders within pregnancy, abnormal foetal positioning, extraction, torsion, embryotomy, c-section, normal and pathological puerperal, post-partum behaviour, metritis, intervening measures in puerperium, aftercare, post-natal care, feeding and diseases of calves; birthing problems in the mare, obstretics: comparison between the species. Traditional lectures are supplemented by a multimedia CD. http://www.tiergeburtshilfe.de
Test or examination	Oral exam at the end of the semester

Course: Diseases of the Teat and Udder

Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Development and organisation of the mammary gland, physiology and pathology of lactation; mastitis: definition, epidemiology, etiology, pathogenesis, diagnosis, therapy, prophylaxis, udder health control, udder health management; disturbances of milk flow, diseases of the teat and teat injuries; milking hygiene, technical aspects of milking, mechanised milking. Topics will be discussed on the cow. Special features of other species are also discussed. http://www.eutervorlesung.de
Test or examination	Oral exam at the end of the semester

Course: Medical and Surgical Diseases of the Horse II

Type of course	Lecture / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Dental diseases, bradygnathy, alveolar fracture, mandible fracture; diseases of the head: tongue, palate, larynx, cervical vertebrae fractures, torticollis, spinal ataxia, withers and back, chest, pelvis, tail; colic surgery, castration, cryptorchidism, inguinal hernia, diseases of the penis; surgery of female reproductive diseases, respiratory diseases (airways, lung, pleura), diseases of the oesophagus and stomach, dysphagia and regurgitation, intestinal diseases, colic-syndrome (symptoms, diagnosis, therapy).
Test or examination	Oral exam at the end of the semester

Course: Surgery and Anaesthesia

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Sterilisation and disinfection, suture techniques, bandages, local anaesthesia, general anaesthetics (large and small animals), emergency care, surgical instruments, osteosynthesis.
Test or examination	Oral exam at the end of the semester

Course: Ophthalmological Examination

Type of course	Lab / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Introduction to clinical aspects of anatomy and physiology of the eye, optical properties of the eye and methods of clinical examination, pharmacology of the eye; lecture part on eye diseases and its adnexes; instruments used in ophthalmology; examination of the outer eye; illumination of the vitreous chamber and lenses; examination of the retina; exercises with eye specimens from the slaughterhouse: setting a cornea defect and staining it with flourecine, subconjunctival injections, diverse operations on eyes (conjunctival flap, aspiration of the inner eye, cornea resection, iris resection, lens extraction, surgical approach to the vitreous body, surgery of the retina and others).
Test or examination	Oral exam at the end of the semester

Course: Medical and Surgical Diseases of Ruminants III

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	Haematological and haematopoietic diseases, diseases of the lymph apparatus, kidney and urinary tract, and skin; Intoxication.
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration II (Equine Clinic)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 6th semester
Test or examination	Written case report

Course: Clinical Demonstration II (Buiatric and Reproduction Clinic) + Group Exercises (Buiatric Clinic)

Type of course	Demonstration / 3 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration II (Small Animals)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the pre-clinical boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam at the end of the semester

8th Semester

Course: Poultry Diseases

Type of course	Lecture / 2 hours per week
ECTS credits	2.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	1. viral diseases: avian encephalomyelitis, infectious bronchitis, infectious bursitis (Gumboro-), fowl plague, Newcastle disease, infectious laryngotracheitis, rhinotracheitis of the turkey, Marek's disease, leukaemia, pox, adenovirus, and reovirus infections. 2. Bacterial diseases: Salmonella, coli infection, pasteurellosis (poultry cholera), ornithosis, mycoplasmosis, coryza contiagosa, erysipelas, Clostridia, Ornithobacterium rhinotracheale. 3. Parasitic diseases: Coccidiosis, typhlohepatitis, round worms, tape worms, ectoparasites. 4. Deficiencies and metabolic diseases: Vitamin A, B, E (encephalomalacia), K deficiency (haemorrhagic syndrome), perosis, gout, hepatic lipidosis (FLKS). 5. Propaedeutic of ornamental and wild birds 6. Selected diseases of ornamental and wild birds
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration Poultry I

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Propaedeutics of ornamental, zoo, wild birds, and poultry as well as husbandry and demands of different species including pigeons. Avian diseases (viral, bacterial, mycotic, parasitic) are discussed on patients. Possibilities of diagnosis, such as necropsy and lab work for poultry and ornamental birds (endoscope, radiographs, ultrasound). Surgery of the skeletal and soft tissue including anaesthesia.
Test or examination	Oral exam at the end of the semester

Course: Necropsy I

Type of course	Lab / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Necropsies of all species with emphasis on necropsy technique and description; writing of a necropsy report.
Test or examination	Active work and oral participation; acceptance of the necropsy report

Course: Demonstration in Anatomical Pathology I

Type of course	Demonstration / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Investigation and interpretation of organ abnormalities.
Test or examination	2 oral tests on different specimens during the semester

Course: Veterinary Outpatient Treatment I (Equine Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Equine Clinic:* Instruction on professional aspects of a veterinary outpatient treatment in racetracks, riding schools, and stables; examination and therapy is performed under supervision and instruction of a veterinarian. Theoretical knowledge is reinforced and expanded upon.
Test or examination	Oral exam at the end of the semester

Course: Veterinary Outpatient Treatment I (Buiatric Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Buiatric Clinic:* Groups of a maximum of 3 students (for each student compulsory once per semester) participate in this day-long field trip to agricultural operations in the Berlin area. Examination and diagnostic procedures are performed, clinical findings are evaluated and patients are diagnosed and therapy is performed, treatment of the claw and udder, pregnancy testing, sterility treatments, immobilisation of free-range cows and wild animals, organisation and execution of vaccination programmes and herd specific prophylactic measures and udder reconstruction programmes.
Test or examination	Oral exam at the end of the semester

Course: Veterinary Herd Management I (Buiatric Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Groups of a maximum of 6 student (for each student compulsory once per semester) participate in this day-long field trip to agricultural operations in the Berlin area. Recognition and elimination of non infectious, nutritional, metabolic herd diseases is exercised. This includes taking a herd history, examination of diseased animals, obtaining diagnostic samples for further diagnostic examination, evaluation of husbandry and nutrition, development of a therapy plan, development of a prophylactic plan, economic estimation.
Test or examination	Oral exam at the end of the semester

Course: Herd Management I (Reproduction Clinic)

Type of course	Seminar and Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Day-long field trip in groups of 2 to 3 students, seminar in groups of 30 students. Presentation, examination and interpretation of herd based problems with special emphasis on fertility, udder health and calf diseases. The students have the opportunity to examine a large number of animals and experience biological variability of the bovine species and to establish the connection between animal husbandry, management and diseases.
Test or examination	Oral exam at the end of the semester

Course: Food Safety

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Technology of food production (heat, cool, salt, cure, smoke etc.), food laws; product knowledge; quality safety
Test or examination	Oral exam at the end of the semester

Course: Food Safety Lab I

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Food laws; food analysis: serology; characteristics and technology of meat, minced meat, sausage and other meat products; fish and fish products; eggs and egg products.
Test or examination	Case study during the semester

Course: Meat Hygiene – Lab

Type of course	Lab / 3 hours per week
ECTS credits	3.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Basic morphological examination of slaughtered animals; examination procedures for pigs (by-products, carcass and head, trichinoscopy), cattle (by-products, carcass and head, BSE, law sector); control in poultry production (legislation, meat inspection, interpretation of data); performing a post-mortem inspection on cattle and pigs, outline and overall inspection; legal regulations for post-mortem inspection; report; morphological signs for drug application in cattle and pigs; further examination of large animals (lymph nodes, factors of meat quality, bacteriological examination of the meat, testing for chemical residues); locations for sampling; hygiene and technology in meat inspection (recording of hygiene in the slaughterhouse, cleaning and disinfection), laboratory techniques (pH, water binding capacity, conductivity, discoloration; androgens – cooking test; icterus / alimentary yellow; basics of sensory examination; morphological differentiation of species; bacteriological meat examination).
Test or examination	Attendance in small groups, introductory oral test

Course: Meat Hygiene – Meat inspection

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Overview:* execution of legally regulated controls of food producing animals under consideration of the various inspection objectives. The human environment and the situation in intensive husbandry (diseases, zoonosis, faulty management, animal welfare); legal basis (national law, EU-law); elements of controlling: herd control and others (testing for chemical residues, husbandry and animal welfare, transport and stunning, hygiene control and other quality insurance measures); individual control (the morphological variant, overview, objectives of the SFU, possibilities of ante-mortem inspection, procedures in post-mortem inspection),additional examinations with laboratory and other techniques; possibilities of evaluation (individual examination and group evaluation); statistics of meat hygiene and its meaning. The different production lines, ante-mortem and meat inspection of the pig (zoonosis, species-specific characteristics, resulting examination strategy, legislation); ante-mortem and meat inspection of cattle (zoonosis, BSE and TSE; species-specific characteristics, resulting examination strategy, legislation); ante-mortem and meat inspection of other species (game animals, rabbit, soliped, small ruminants, characteristics, resulting examination strategy); ante-mortem and meat inspection of poultry (zoonosis, animal origin, species-specific characteristics, resulting examination strategy, legislation).
Test or examination	Oral exam at the end of the semester

Course: Meat Hygiene – Hygiene and Technology in Meat Production

Type of course	Lecture / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	This lecture presents the basics of meat production from food producing animals, the techniques of transport and meat production incl. cooling. *Technology of meat production (large animals):* Transport, delivery and waiting pens; stunning (techniques, law, problems as pen design or placement of the forceps, captive-bolt stunning and prions, CO_2 and excitement, electricity and achievement of current). *Procedures in meat production:* The relation of technical procedure and bacteriological data ; problems; hygiene of meat production in cattle and pigs. Procedures in poultry production, consequences for hygiene; *Special aspects:* small ruminants, rabbits, game animals and cooling; refrigerated transport (technique, law, hygiene and problems in cooling); carcass cutting (DLG-sections, procedures, hygiene of cutting); hygiene of meat production, options of control (microbiological; GHP and HACCP; hygiene and husbandry, transport and meat production, hygiene control of the agricultural operation); the environment (surfaces, instruments, water, air); the human (industrial safety, zoonosis, problems in hygiene)
Test or examination	Oral exam at the end of the semester

Course: Intensive Care (Equine Clinic)

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Patient registration, information of the owner, report an evaluation of clinic history, diagnosis; execution of therapeutic measures, prognostic statement.
Test or examination	Case study

Course: Clinical Demonstration III (Buiatric and Reproduction Clinic) + Group Exercises (Buiatric Clinic)

Type of course	Demonstration / 3 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam with patient at the end of the semester

Course: Intensive Care (Small Animal Clinic)

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Increasing the knowledge from the lectures and exercises within day to day clinic. Emphasis on intensive care, patient treatment, emergency care.
Test or examination	Oral exam at the end of the semester

Course: Cross-Clinic

Type of course	Comprehensive lecture with instructors from at least 2 different departments / 9 hours per week
ECTS credits	8.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Poultry:* anatomy, physiology, etiology, diagnosis, clinic and treatment of poultry diseases of different organs: respiratory, intestinal, skeletal diseases; use of pharmaceutics and vaccination of poultry; hygiene of poultry husbandry. Co-operation of the different departments involved with these subjects. *Small animals:* presentation of clinical subjects under consideration of the different departments. *Equine:* presentation of clinical subjects under consideration of the different departments. *Buiatric:* most relevant bovine, ovine, porcine diseases under consideration of different veterinary disciplines and case reports concerning herd problems. *Reproduction:* Different topics concerning reproduction and udder health, e.g. placental retention, mastitis, paediatrics, biotechnology.
Test or examination	Oral exam at the end of the semester

9th Semester

Course: Forensic Veterinary Medicine

Type of course	Lecture / 2 hours per week
ECTS credits	2.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Introduction to the basics of legal rights; veterinarian in court; veterinary certificate, protocol, opinion; introduction to the German Civil Code (Bürgerliches Gesetzbuch); general right of purchase; right to purchase an animal, purchase of consumer goods, other horse purchase, special rights of purchasing commercial animals; general liability; special liability for veterinarians, liability regulations, liability of contracts; contract of manufacture; contract of employment, general terms and conditions; pre-purchase exam; general and special obligation to accuracy (injection, infusion, rectal examination, colic, anaesthesia, castration); liability in clinic duties; professional insurance of liability; liability veterinarian / farrier; owner, drug law (change of inscription, therapy emergency), equine passport, animal insurance; animal welfare rights, doping, euthanasia, regulations for veterinary fees (GOT).
Test or examination	Oral exam at the end of the semester

Course: Epidemic Control II

Type of course	Seminar / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Epidemics, animal disease legislation:* measures against import of animal diseases (EU member states and other countries); measures against national epidemic dangers; epidemic alarm and disease control; reimbursement for animal loss; measures against individual animal diseases, hog cholera, rabies, brucellosis, salmonellosis; exercises, carcass disposal law, carcass disposal plant legislation.
Test or examination	Oral exam at the end of the semester

Course: Necropsy II

Type of course	Lab / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Necropsy of all species with emphasis on morphological and functional diagnostics. Writing of a necropsy report.
Test or examination	Active work and oral participation; acceptance of the necropsy report

Course: Demonstration in Anatomical Pathology II

Type of course	Demonstration / 1 hour per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Diagnostics and concise case report of organ abnormalities.
Test or examination	2 oral tests on different specimens during the semester

Course: Veterinary Outpatient Treatment II (Equine Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 8th semester
Test or examination	Oral exam at the end of the semester

Course: Veterinary Outpatient Treatment II (Buiatric Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 8th semester
Test or examination	Oral exam at the end of the semester

Course: Veterinary Herd Management II (Buiatric Clinic)

Type of course	Field trip / 0.5 hours per week
ECTS credits	0.25
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 8th semester
Test or examination	Oral exam at the end of the semester

Course: Necropsy of Poultry and Poultry Outpatient Treatment

ECTS credits 0.25

Necropsy

Type of course	Lab / 0.25 hours per week
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	In the diagnostic exercises students learn how to perform a post mortem examination to evaluate specific morphological changes of different diseases and make a list of differentials. Various methods of injections, drawing blood and obtaining diagnostic material are discussed. Different laboratory examination methods are shown.
Test or examination	Oral exam at the end of the semester

Poultry Outpatient Treatment

Type of course	Field trip / 0.25 hours per week
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	The poultry outpatient treatment class is taught in private poultry farms , which raise a variety of birds for meat or eggs in different husbandry systems. The main topic of this class are flock treatment and management. The goal is to diagnose flock health based on clinical signs and diagnostic tests performed on single birds. The economics of poultry production are also considered.
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration Poultry II

Type of course	Demonstration / 2 hours per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 8th semester
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration III (Equine Clinic)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam at the end of the semester

Course: Clinical Demonstration IV (Buiatric and Reproduction Clinic) + Group Exercises (Buiatric Clinic)

Type of course	Demonstration / 3 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam with patient at the end of the semester

Course: Clinical Demonstration III (Small Animal Clinic)

Type of course	Demonstration / 2 hours per week
ECTS credits	1.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	See 6th semester
Test or examination	Oral exam at the end of the semester

Course: Surgery Lab

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	*Exercises on the horse:* Operations on the hoof; operation of a splint bone fracture; destotomy of the accessory ligament of the deep digital flexor and collateral sesamoidean ligament; intra-synovial injection; peripheral nerve blocks on the foot; peripheral nerve blocks on the head; operations of the eye. *Exercises on dead dogs or cats:* laparotomy in the Linea alba; gastrotomy, castration / spaying; bulbus extirpation; amputation of the dew claw; intestinal resection with end-to-end anastomosis, cystotomy; nictiting flap. *Exercises on the bovid:* operations on the bovine claw; methods of claw amputation; resection of the digital flexor tendon and sesamoidea; orthopaedic measures; treatment of claw ulcers; methods of anaesthesia.
Test or examination	Oral exam with patient at the end of the semester

Course: Food Safety Lab II

Type of course	Lab / 2 hours per week
ECTS credits	2.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Methods of food analysis (histology, microbiology, sensory), case studies, fish.
Test or examination	Case study during the semester

Course: Milk Examination Lab

Type of course	Lab / 2 hours per week
ECTS credits	1.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Analytical methods in milk hygiene: chemical, physical, microbiological, cytological.
Test or examination	Examination of a milk sample and written report

Course: Milk Hygiene	
Type of course	Lecture / 1 hour per week
ECTS credits	0.5
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	Milk components; milk borne infections and intoxication; residues in milk; mastitis; milk technology; butter; cheese.
Test or examination	Oral exam at the end of the semester

Course: Cross Lecture Food Safety	
Type of course	Comprehensive lecture with instructors from different departments / 9 hours per week
ECTS credits	8.0
Prerequisite	Successful completion of the first section of the veterinary boards or comparable achievement
Course contents	The comprehensive lecture is designed as a mixture of seminar, independent work, extern lectures, discussions, and presentations. Predetermined subjects will be discussed based on a 14-day work unit: *Food Hygiene:* Food chemistry, knowledge of goods, residues, epidemiology *Meat Hygiene:* Prevention of salmonella infections (herd recording, herd decontamination, models). Stunning of production animals (electric, poultry, CO_2, technique, aspects of animal welfare). Substance circulation in agriculture (composting, manure, epidemic pathogens, survival of pathogens, waste water processing, wastes, specified risk material, carcass disposal). Transmissible Encephalopathy (feedstuff as vehicle, measures of prevention as eradication, animal identification and food labelling, specific risk material, changes in slaughter technology) resistance (transmission pathways, molecular-biological components for the development of resistance, prevention, detection of transmission from animal to human). Extrinsic matter as risk factor (environmental contamination, known incidents, control systems as a consequence, toxicology of environmental contamination). Meat extraction from production animals (beef, pork, poultry; risk analysis, consequences for monitoring).
Test or examination	Oral exam at the end of the semester