

ECTS-CATALOGUE

Veterinary Medical Faculty



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Introduction

The curriculum of veterinary education at the Justus-Liebig-University Giessen experienced significant changes with the amendment of the Veterinary Approbation Regulation (TappV) of 2006 and the Study and Assessments regulation of 2007 (StuPO Vet). The most important changes relate to the introduction of a “clinical rotation” in semester 9 and 10, which includes an intramural and extramural part (veterinary practice, abattoir, public health inspection office, etc.) and a change towards an organ-orientated training regarding all species and disciplines. The major revision was unanimously agreed upon by the Faculty Council and first took effect in the winter semester of 2007/08. It started with the students of the 1st and 5th semesters and required an appropriate adjustment of lectures and elective courses in accordance with the Annex 1 of the TappV, which specifies all compulsory courses. The curriculum and timetables had to be modified to ensure a consecutive structuring of topics and contents. A reorganisation of the practical work, which to some extent includes animals handling and the tutorials was also required, since these should follow shortly before or after the lectures and not exceed a certain capacity of students to ensure ideal working and learning conditions.

The ultimate goal of the amendments was to ensure a prompt completion of all examinations after the attendance of the respective lectures. Since the curriculum had now undergone significant changes, it was now necessary to amend the ECTS catalogue as well, not only to indicate the number of ECTS credit points for each of our courses, but also to ensure comparability and synchronization with other German and International Veterinary Educational Institutions regarding the content of the modules and the learning objectives. Thus, students who wish to follow their degree course at various universities can find out which courses they can attend at Giessen University that will be accredited towards their graduation. Furthermore, the catalogue will show students from Giessen which requirement courses attended abroad, for example within the framework of an Erasmus programme, need to fulfil to receive accreditation from Giessen University. We hope this ECTS catalogue will not only appeal to students, but will also encourage teachers to check the syllabi of other courses in order to ascertain that their courses will fit seamlessly into the curriculum.

The ECTS Catalogue Team

*Melanie Grein, Reto Neiger,
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GENERAL INFORMATION

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Petra Schulze/Jessica Wilzek
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Doctorate

Legal basis: Promotionsordnung,
please refer to the following website:
[http://www.uni-giessen.de/cms/mug/7/
findex4.html](http://www.uni-giessen.de/cms/mug/7/findex4.html)

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to the following website:
[http://www.uni-giessen.de/cms/mug/7/
findex45.html](http://www.uni-giessen.de/cms/mug/7/findex45.html)

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GENERAL INFORMATION

CLINICS AND INSTITUTES

**Institute for Veterinary Anatomy,
Histology and Embryology**
Frankfurter Str. 98
Phone: ++49 (641) 99-38101

**Institute for Biochemistry and
Endocrinology**
Frankfurter Str. 100
Phone: ++49 (641) 99-38171

**Institute for Hygiene and Infectious
Diseases of Animals**
Frankfurter Str. 85-89
Phone: ++49 (641) 99-38301

Institute for Veterinary Food Science
Frankfurter Str. 92
Phone: ++49 (641) 99-38251

**Institute for Veterinary Food Science –
Professorship for Dairy Science**
Ludwigstr. 21b
Phone: ++49 (641) 99-38951

Institute for Veterinary-Pathology
Frankfurter Str. 96
Phone: ++49 (641) 99-38201

Institute for Parasitology
Rudolf-Buchheim-Str. 2
Phone: ++49 (641) 99-38461

Institute for Veterinary-Physiology
Frankfurter Str. 100
Phone: ++49 (641) 99-38151

**Institute for Pharmacology
and Toxicology**
Frankfurter Str. 107
Phone: ++49 (641) 99-38401

Institute for Virology
Frankfurter Str. 107
Phone: ++49 (641) 99-38351

**Professorship for Animal Welfare and
Ethology**
Frankfurter Str. 104
Phone: ++49 (641) 99-38751

**Clinic for Reproduction with veterinary
ambulance**
Frankfurter Str. 106
Phone: ++49(641) 99-38695

**Clinic for Small Animals
(Internal Medicine and Surgery)**
Frankfurter Str. 126 + 108
Phone: ++49 (641) 99-38601/-38501

**Clinic for Horses
(Internal Medicine and Surgery)**
Frankfurter Str. 126 + 108
Phone: ++49 (641) 99-38570/-38650

**Clinic for Birds, Reptiles, Amphibians
and Fish**
Frankfurter Str. 91-93
Phone: ++49 (641) 99-38431

**Clinic for Farm Animals (Ruminants and
Swine)
(Internal Medicine and Surgery)**
Frankfurter Str. 110 u. 112
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EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

The ECTS (European Credit Transfer and Accumulation System) is a credit system that guarantees full academic recognition of academic performance within Europe. The European Union has developed the ECTS to ensure that students will receive full accreditation of points (credits) for the courses they attend and the academic work they accomplish during a period of studying abroad. The system facilitates the assessment and comparison of learning outcomes. Furthermore, it allows the international transfer of credits between universities. Mutual trust and recognition of the participating universities are the fundamental principles of the ECTS. Further, new policies regarding the exchange of information (e.g. of the university calendar), the accreditation of the curriculum of each respective university and the allocation of ECTS credits which define the workload of other universities have been created and implemented to en-

hance this mutual trust. Within each department of the University of Giessen, ECTS credits are allocated to each and every course. In accordance with the guidelines of the ECTS, these credits reflect the workload of each course in proportion to the workload necessary for the successful completion of one full academic year. Within the ECTS, the credits amount to 60 annually, and accordingly a single semester is given 30 credits.

For further information, students are welcome to contact the ECTS coordinator (Veterinary Medicine: Frau Katrin Ziegenberg, Frankfurter Strasse 94, 35392 Giessen, Tel: +40 (0)641 99 38,007)

We would like to point out that all of the courses listed in the ECTS catalogue are regular courses and will also be attended by the students of Giessen University. Please note that no special courses will be held for ECTS purposes. Credits will only be awarded if the student has attended the complete course for the full semester and has met all further requirements.



GENERAL INFORMATION

THE CURRICULUM OF THE VETERINARY MEDICAL FACULTY OF THE JLU GIESSEN

The following information relates to section 1, § 1 of the Veterinary Approbation Regulation (TAppV).

The study of Veterinary Medicine comprises:

1. a scientific-theoretical part taught throughout a period of four and a half years, with a total of 3850 hours (these may not be exceeded) of compulsory and elective courses, for the study of the fundamentals of Veterinary Medicine, at any university or equivalent institute of higher education, with regard to later use in veterinary practice.
2. a practical part consisting of 1170 hours.
 - a) 70 hours (generally, a period of two weeks) in Agriculture, Animal Breeding and Animal Husbandry (after the 1st semester, at the study and research facility Oberer Hardthof)
 - b) 150 hours (generally, a period of four weeks) in a veterinarian practice or clinic (after the 6th semester)
 - c) 75 hours (generally, a period of two weeks) in Hygiene Control and Food Control/Investigation (extramural during the clinical rotation)
 - d) 100 hours (generally, a period of three weeks) in Ante and Post mortem Meat Inspection and Quality Control (extramural during the clinical rotation)
 - e) 75 hours (generally, a period of two weeks) in Veterinary Public Health Service (extramural in the clinical rotation)
 - f) 700 hours (generally, a period of 16 weeks) in a veterinary practice, clinic or in an internship of choice (extramural during the clinical rotation). The 9th and 10th semester comprise the clinical rotation: 25 groups of approximately 8 students each rotate through individual clinics and institutes of the university (intramural rotation):
 - clinic of equine medicine (internal medicine and surgery): 4 weeks
 - clinic for small animals (internal medicine and surgery): 8 weeks
 - clinic for farm animals (ruminants): 2 weeks
 - clinic for reproduction: 4 weeks
 - clinic for birds, reptiles, amphibians and fish: 2 weeks
 - clinic for farm animals (swine): 1 week
 - Pathology, Virology and Bacteriology: 1 week each
3. the following examinations:
 - a) **the Veterinary Intermediate Examination (Tierärztliche Vorprüfung)**
The Veterinary Pre-Intermediate Examination (Vorphysikum) after the 2nd semester (in Botany of Feed Crop, Poisonous and Medicinal Plants, Zoology, Chemistry and Physics including fundamental knowledge concerning physical radiation protection), followed by the Veterinary Intermediate Examination (Physikum) after the 3rd semester (in Anatomy, Histology and Embryology) and after the 4th semester (in Animal Breeding and Genetics, including Animal Assessment, Physiology, Biochemistry),



b) The Veterinary Medical Examination (German Veterinary Licensing Examination = Staatsexamen, Tierärztliche Prüfung)

The examination begins with the first exams after the 5th semester and ends with the final examinations after the 11th semester:

- after the 5th semester in: Virology (written), Bacteriology and Mycology (oral); Clinical Propaedeutics (practical)
- after the 6th semester in: Animal Husbandry and Animal Hygiene (oral), Parasitology (oral/practical), Pharmaceutical and Drug Prohibition Law (oral/practical), Animal Nutrition (written) as well as parts of the exams in: Internal Medicine, Surgery and Reproductive Medicine (written)
- after the 7th semester in: Animal Welfare and Ethology (written), Radiology (written), as well as parts of the exams in: Internal Medicine, Surgery and Reproductive Medicine (written)
- after the 8th semester in: Pharmacology and Toxicology (written/oral), Dairy Science (written), Combating Epizootic and Infectious Disease (oral), Forensic Medicine/ Professional and Ethical Law (written), as well as parts of the exams in: Internal Medicine, Surgery and Reproductive Medicine (written)
- during the clinical rotation: parts of the exams in Internal Medicine, Surgery and Reproductive Medicine (oral)
- during the 11th semester in: General and Specific Pathology, Pathological Anatomy and Histology (oral/practical), Meat Hygiene (oral/practical), Food Science, including Food Hygiene (oral/practical),

Poultry Diseases (oral/practical) and parts of the exams in Internal Medicine, Surgery and Reproductive Medicine (written).

- For each semester, syllabi and timetables will be published timely before the start of the courses. Here students can find information about lectures, tutorials, and seminars; rooms and locations; and instructors and teachers. These are available online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/studium>

Allocation into practical groups is centralised and can be accessed online via Stud-IP

<https://studip.uni-giessen.de/studip>

- Further information on the curriculum can be found in the Veterinary Approbation Regulation (TAppV) and the Study and Assessments regulation of 2007 of the JLU Giessen (StuPOVet).

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/downloads/TAppV.pdf/view>

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/Gesetze/studien-und-prufungsordnung/>

GENERAL INFORMATION

EVALUATION

The evaluation of the academic performance at the Faculty of Veterinary Medicine, JLU-Giessen (TappV § 14) consists of the following grades:

VERY GOOD (1)

- an excellent performance

GOOD (2)

- a performance that exceeds average requirements significantly

SATISFACTORY (3)

- a performance that fulfils the average requirements in every respect

SUFFICIENT (4)

- a performance that despite its deficiencies still meets the requirements

FAIL (5)

- a result that because of its deficiencies does not meet the requirements

Rating within the ECTS-system is according to the following evaluation scale (§ 15 StuPO Vet):

The Department will, on request of the student, add a testimony on results alongside

the reference. This includes a rating system based upon the ranking of successfully examined students in the current year and the two previous years.

SEMESTERWOCHENSTUNDE (SWS) = CONTACT HOUR PER WEEK (CHW)

One contact hour per week (CHW) is calculated based on the number of hours per course (each 45 min.) in a semester divided by the number of weeks in the semester. If a one hour course is given once weekly, the course has an amount of 1 CHW. There will be no differentiation between a winter semester (15 week lecture period) and a summer semester (14 week lecture period); a semester is always calculated with 14 weeks.

Grade	Grade span	Definition	Definition (German)
A	1,0 - 1,5	Excellent	Hervorragend
B	1,5 - 2,0	Very good	Sehr gut
C	2,1 - 3,0	Good	Gut
D	3,1 - 3,5	Satisfactory	Befriedigend
E	3,6 - 4,0	Sufficient	Ausreichend
FX/F	4,1 - 5,0	Fail	Nicht bestanden



COURSE TYPES

There are different types of courses, which differ in structure and in the degree of commitment they require. The course types are: **Lecture (L) (Vorlesung), Seminar (S), Practical (P) (Übung) or Animal Handling (AH) (Übung am Tier)**. These courses are defined as follows in the appendix of Kapazitätsverordnung (KapVO; Gesetz- und Verordnungsblatt for Land Hessen from the 29.12.1975 and 10.01.1994):

L: lecture (course type A, k = 1 of the Kapazitätsverordnung of 29/12/1975; unlimited group size) provides and mediates basic scientific and specific knowledge. The instructor speaks and the students act predominantly receptive.

S: in seminars (course type B, k = 4 of the Kapazitätsverordnung of 29/12/1975; group size n = 30), the instructor directs the course, provides tasks, monitors the activities of students and chairs discussions. Students practise skills and meth-

ods, hold presentations, discuss topics or solve exercises.

P: in practicals (course type D, k = 7 of the Kapazitätsverordnung of 29/12/1975; group size n = 15), skills and knowledge are conveyed by solving practical and experimental tasks. The instructor directs and supervises students during the course. Students accomplish practical work and experiments.

AH: in a tutorial with animals / animal handling (course type F, k = 12 of the Kapazitätsverordnung of 29/12/1975; group n = 5) medical expertise is systematically explained. Students learn to diagnose conditions and diseases and to propose treatments. The instructor observes and directs the students; the students employ the acquired skills and knowledge.



GENERAL INFORMATION

COMMITMENT TOWARD LECTURES

Compulsory courses (CC) (Pflichtveranstaltungen) are courses that require continuous and successful participation according to the TAppV (seminar and practicals). Lectures do not have compulsory attendance. Regular participation means: presence during at least 85% of the course. This means that courses with 1 contact hour per week (1 CHW) allow a maximum absence of 2 hours. Elective courses (EC) (Wahlpflichtveranstaltungen) are courses in which students must provide a certificate for a particular study section with a minimum number of hours in these particular courses. Students are able to choose between various topics. Attestation is given in CHW.

One ECTS contact hour per week has a credit point value of 1. There is no set number of elective courses in a semester, because ECs can be chosen freely by the students.





General Information

1

2

3

4

5

6

7

8

9

10

1ST SEMESTER

	CHW	ECTS
Anatomy L	3	3
Anatomy P	4	5
Botany L	2	2
Chemistry L	4	4
Terminology L	2	3
History of Veterinary Medicine L	1	1
Histology and Embryology L	2	2
Physics L/P	4	5
Animal Husbandry L	1	1
Zoology L (including one seminar))	4	4
Elective courses		
Practical		
Agriculture, Animal Breeding and Animal Husbandry (two weeks)		4

L= lecture, P= practical, S=seminar

CHW = contact hour per week (Semesterwochenstunde)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>



ANATOMY I

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and co-worker

Course type:
lecture (3 CHW) + practical (4 CHW)

ECTS:
lecture: 3, practical: 5

Introduction:
Anatomy of the Locomotor System: bones, joints and muscles of the body, including blood vessels and nerves of the extremities.

Overall aims and objectives:

Students should be able to:

- describe bones, joints and muscles in domestic mammals and explain differences between the various species
- apply the knowledge acquired to the preparation of the object itself

Reading list:

Nickel, Schummer, Seiferle, Lehrbuch der Anatomie der Haustiere, Herausgeber: Parey Bei Mvs, 1. Edition (1997), ISBN-13: 978-3830440178

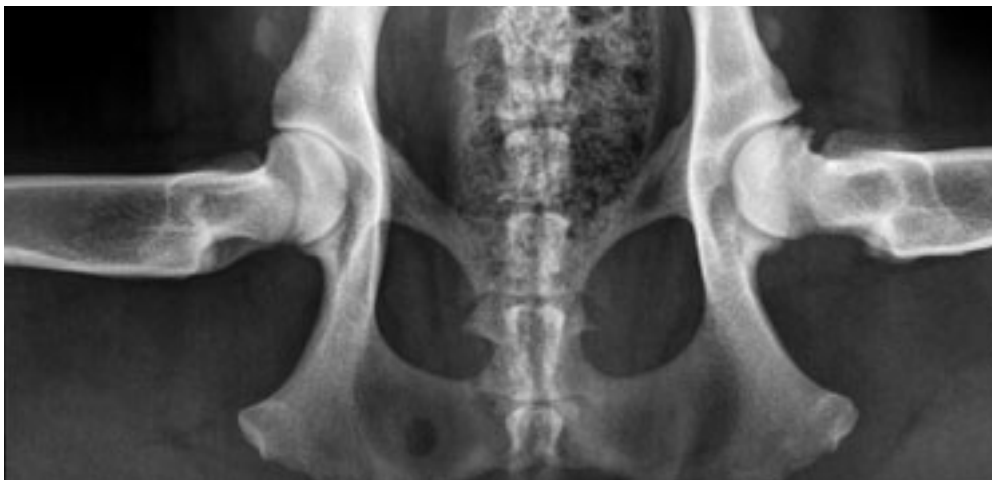
König/Liebig: Anatomie der Haussäugetiere: Lehrbuch und Farbatlas für Studium und Praxis, Herausgeber: Schattauer, 4. Edition (2008), ISBN-13: 978-3794526505

Scripts:
lecture notes

Learning recommendations:
see literature and scripts

Assessment:

three oral exams during the semester and one oral exam after the third semester within the framework of the Veterinary Intermediate Examination in "Anatomy"



INTRODUCTION TO BOTANY

Coordinator:
Wissemann

Instructors:
Wissemann, Forreiter

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

The course "Introduction to Botany" presents the topics of Botany in its full extent tailored to the needs and requirements of the veterinarian profession. Commencing with mechanisms of diversification, such as co-evolution, evolution factors and speciation, reproductive survival strategies (metabolism in the broader sense, photosynthesis, hydration, metabolisms and the basic organs involved in those (sprout, leaf, root)), the variety of flora will be outlined and explained as a result of adaptation to conditions of terrestrial life through natural selection, and, in the case of the evolution of crop plants, through anthropogenic selection.

Overall aims and objectives:

Students should be able to:

- trace the evolution of the plant world
- deduce basic processes that lead to the diversification of the plant world
- employ knowledge of processes and be able to transfer the meaning and occurrence of poisons to an evolutionary biological context

Reading list:

Jäger, E.J., Neumann, St., Ohmann, E.: Botanik, Herausgeber: Spektrum Akademischer Verlag; 5. Edition (2003), ISBN-13: 978-3827409218

Wagenitz, Gerhard: Wörterbuch der Botanik (Sav Biologie), Herausgeber: Spektrum Akademischer Verlag, 2. Edition (2003), ISBN-13: 978-3827413987

Scripts:

electronic scripts will be supplied

Learning recommendations:

reading, reading, reading...

Assessment:

a written exam within the framework of the Veterinary Pre-Intermediate Examination in "Botany" after the second semester



CHEMISTRY

Coordinator:
Schindler/Göttlich

Instructors:
Schindler/Göttlich

Course type:
lecture (4 CHW)

ECTS:
4

Introduction:

- atomic and molecular structures, periodic table, elements of nature, introduction to specific s- and p-block elements, chemical bonding, chemical equations, stoichiometry
- substance properties, chemical bond, mixtures, osmoses
- acid-base reactions; buffer systems, pH-value
- redox reaction, redox potentials, electro chemistry
- chemical balance/ thermodynamic/ catalyze
- basic ideas of spectroscopy
- organic molecules: chemistry of functional groups and concerning basic reaction mechanisms, alkane,

alkene, alkyne, halogen alkane, alcohol, amine, ether, aldehyde and ketene, carbon acids and attached derivates, arenes, selected natural resources (sugar, peptides, alkaloids, carbohydrates, nucleotides, steroids, vitamins)

- organic-chemical reaction mechanisms
- basic ideas of stereo-chemistry

Overall aims and objectives:

Students should be able to:

- explain basic concepts of chemistry, such as the periodic table, formula language, semantics and stoichiometric calculations
- demonstrate the basic principles in inorganic (acids and bases, redox) and organic (functional groups) chemistry
- outline substance properties of specific elements and bonds of the periodic table
- document the basic principles of organic chemistry (functional groups, reactivity, nomenclature)
- demonstrate a profound basic knowledge of important chemical reactions in inorganic and organic chemistry



1ST SEMESTER

Reading list:

Zeeck, Chemie für Mediziner, Herausgeber: Urban & Fischer Bei Elsevier; 5. Edition (2003), ISBN-13: 978-3437424410

Mortimer, Chemie, Herausgeber: Thieme, Stuttgart; 7. Edition (2001), ISBN-13: 978-3134843071

Electronic sources:

an electronic version of the lecture is currently available online:

<http://www.uni-giessen.de/cms/fbz/fb08/chemie/lehre/nf-che-vl>

Scripts:

currently available online:

<http://www.uni-giessen.de/cms/fbz/fb08/chemie/lehre/nf-che-vl>

Self-assessment:

exercises are available online; voluntary participation in additional tutorials is currently possible

Assessment:

an exam at the end of the first semester which needs to be taken in order to qualify for the practical part in the second semester; if passed the grade will be taken into account for the practical exam;

a written exam within the framework of the Veterinary Pre-Intermediate Examination in "Chemistry" after the second semester



TERMINOLOGY

Coordinator:

Giese

Instructors:

Giese

Course type:

lecture (1 CHW) + practical (1 CHW)

ECTS:

3

Introduction:

An introduction to the nature, application and history of medical terminology; characteristics of anatomic and pathologic nomenclature, applied terminology, re-

spectively parts and structuring of these terms; the relevance of Greek and Latin including the influence of modern foreign languages. On the basis of linguistic content and terms which describe the construction, functions and diseases of the different organ systems, this will, with regard to the varieties of species, serve as an introduction to the complex fields of veterinary medicine.

Overall aims and objectives:

Students should be able to:

- define the parts of medical technical terms and explain their significance with the help of the acquired vocabulary and the terminological basics
- explain coherences that are specific to veterinary subjects and fields

Reading list:

Pschyrembel Klinisches Wörterbuch, Verlag: Walter de Gruyter; 261 neu bearbeitete Edition (2007), ISBN-13: 978-3110185348

Duden. Wörterbuch medizinischer Fachbegriffe, Herausgeber: Bibliographisches Institut, Mannheim; 8. überarbeitete und aktualisierte Edition (2007), ISBN-13: 978-3411046188

Learning recommendations:

a revision of the content of the lecture, the literature and electronic sources recommended during the course

Assessment:

a written exam at the end of the first semester





HISTORY OF VETERINARY MEDICINE

Coordinator:
Giese

Instructors:
Giese

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
This course will illustrate the development of veterinary science from the first domestication of animals during the neolithic period to the present day, taking into account different cultural groups. Besides medical and veterinary aspects, cultural and

historical aspects will be considered in a more general manner as well.

Overall aims and objectives:

Students should be able to:

- illustrate and interpret the development of veterinary medicine in its main features

Reading list:

Angela von den Driesch u. Joris, Domestic Animals: Geschichte der Tiermedizin. 5000 Jahre Tierheilkunde, Herausgeber: Schattauer, F.K. Verlag; 2. aktualisierte und erweiterte Edition (2003), ISBN-13: 978-3794521692

Learning recommendations:

re-read the content of the lecture, the literature mentioned above and electronic sources

HISTOLOGY

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:
Histological technology and light microscopy, cell and tissue science (epithelial, connective and supporting tissue, muscles and nerves), microscopy of lymphatic organs.

Overall aims and objectives:

Students should be able to:

- explain different methods of histological techniques from the fixation of samples to the staining of sections
- define the structure and segmentation of cells (organelles) and graphically depict the tissues that form organs; explain the histological structure of lymphatic organs

Reading list:

Eurell/Frappier: Dellmann's Textbook of Veterinary Histology, Herausgeber: Wiley/Blackwell, 6. Edition (2006), ISBN: 978-0-7817-4148-4

Weyrauch/Smollich: Histologiekurs für Veterinärmediziner, Herausgeber: Enke (1998), ISBN-13: 978-3432295015

Electronic learning material:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see literature and sources mentioned above

Assessment:

a written exam during the third semester and an oral exam within the framework of the Veterinary Intermediate Examination in "Histology and Embryology" after the third semester



EXPERIMENTAL PHYSICS FOR VETERINARIANS

Coordinator:
Düren

Instructors:
Düren, Eickhoff, Klar, Kühn, Schlettwein

Course type:
lecture (2 CHW) and practical (2 CHW)

ECTS:
5

Introduction:
content:

- the fundamentals of mechanics, acoustics, thermodynamics, optics, electricity and magnetism
- energy and entropy
- aggregate states, chemical solutions, osmotic pressure, hydrostatics of liquids, gases, gaseous mixtures, diffusion
- structure of matter, of radiation and its interaction with the matter
- radiation protection and application of radiation in medicine
- functionality of diagnostic imaging techniques in medicine

Overall aims and objectives:

Students should be able to:

- explain and apply the fundamental physical values, laws and methods
- understand simple problems in physics to which mathematical techniques were applied
- explain the physical fundamentals of measuring and diagnostic imaging methods in medicine
- evaluate medically relevant aspects of radiation physics and radiation protection

Reading list:

W. Hellenthal, Physik für Mediziner und Biologen, Wiss. Verlagsgesellschaft Stuttgart, 8. neu bearbeitete Edition (2007), ISBN-13: 978-3804723115

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

see StudIP:

<https://studip.uni-giessen.de/studip/>

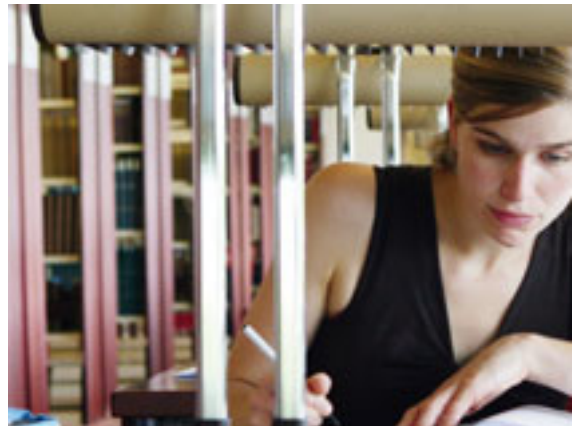
Self-assessment:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

an exam during the second semester and an oral exam within the framework of the Veterinary Pre-Intermediate Examination in “Physics” after the second semester



ANIMAL HUSBANDRY

Coordinator:
Erhardt

Instructors:
Erhardt, Lühken

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

This lecture will impart the ethical and economical requirements of animal husbandry, including legal parameters, basic husbandry methods and criteria for their evaluation, as well as the connection with cross compliance and the requirements of animal husbandry as compared to organic farming.

Overall aims and objectives:

Students should be able to:

- explain the legal parameters of animal husbandry concerning livestock and domestic animals
- describe methods of animal husbandry
- define and explain criteria concerning the evaluation of methods of animal husbandry
- assess negative effects of these methods on the health of animals
- evaluate the effects of these methods on the quality of the foodstuff obtained
- explain the requirements of organic farming in comparison with conventional farming

Reading list:

Methling, W., Unshelm, J.: Umwelt- und tiergerechte Haltung von Nutz-, Heim- und Begleittieren, Herausgeber: Parey Bei Mvs; 1. Edition (2002), ISBN-13: 978-3830440000

Hoy, S., Gaulty, M., Krieter, J.: Nutztierhaltung und -hygiene, Herausgeber: UTB; 1. Edition (2006), ISBN-13: 978-3825228019

Electronic sources:

see StudIP:

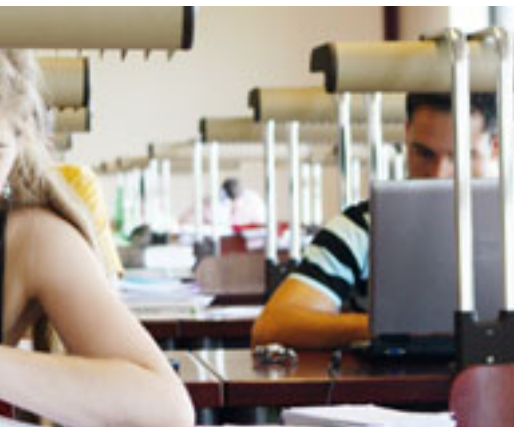
<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see literature mentioned above

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in "Animal Husbandry and Hygiene" after the sixth semester



ZOOLOGY

Coordinator:
Dorresteijn

Instructors:
Clauss, Dorresteijn, Eichelberg, Trenczek

Course type:
lecture and follow-up seminar (4 CHW)

ECTS:
4

Introduction:

The lecture series “Introduction to Zoology for veterinary students” is specially adapted to the study of veterinary medicine. Central aspects of the lecture are the essential systematic, anatomical and evolutionary aspects of the animal kingdom. Commencing with the animal cell, the diverse organisational levels of faunal construction plans will be dealt with, right through to mammals. Special regard is given to the evolutionary development of symbioses and parasitism; further the life cycles of host or intermediate host and symbiont/parasite will be explained.

Overall aims and objectives:

Students should be able to:

- explain the construction and division of animal cells
- explain the anatomy, physiology and position of organs in invertebrates and vertebrates
- outline the life cycles of symbionts and parasites and explain them within their evolutive contexts
- name morphologic and molecular aspects of the systematic classification of animals
- allocate animals to their ecological niches, based upon their anatomy and physiology

Reading list:

Ahne, Liebich, Stohrer & Wolf (2000) Zoologie – Lehrbuch für Studierende der Veterinärmedizin und Agrarwissenschaften, Schattauer, F.K. Verlag (2000), ISBN-13: 978-3794517640

Clauss & Clauss (2005) Zoologie für Tiermediziner, Enke-Verlag, Edition: 1 (2004), ISBN-13: 978-3830410379

Electronic sources:

a script of the lecture will be uploaded to StudIP as learning aide (but not as a substitute for the literature mentioned above!) see StudIP:

<https://studip.uni-giessen.de/studip/>

Self-assessment:

can be found in the book by Clauss and Clauss

Learning recommendations:

during the seminar, the students will be advised on learning methods concerning the special field of “Zoology”

Assessment:

written multiple-choice exam within the framework of the Veterinary Pre-Intermediate Examination in „Zoology” after the second semester

PRACTICAL IN AGRICULTURE, ANIMAL BREEDING AND ANIMAL HUSBANDRY

Course duration:

14 days full time after the winter semester, at the “Lehr- und Forschungsstation Oberer Hardthof”

Coordinator:

Erhardt

Instructors:

Dzapo and assistants

Course type:

practical (2 Weeks)

ECTS:

4

Introduction:

The students will receive an introduction to the general structures of agriculture as well as to the upstream and downstream fields. They will get to know operational procedures and production factors of the various production facilities at the study and research station “Oberer Hardthof” and other agricultural facilities.

Overall aims and objectives:

Students should be able to:

- demonstrate knowledge of organisational structures of agriculture and farms
- explain production factors and procedures in farms with animal husbandry and the manufacturing of foodstuff
- discuss the economical importance of animal production

Reading list:

Weiß, J., Pabst, W., Strack, K.E., Granz, S.: Tierproduktion, Herausgeber: Parey Bei Mvs; 13. überarbeitete Edition (2005), ISBN-13: 978-3830441403

Maximum capacity:

50 students per course, 4 courses will be offered

Assessment:

students prepare protocols that will be graded after the course



2ND SEMESTER

	CHW	ECTS
Anatomy II L	1	1,5
Anatomy II P	2	4
Biostatistics P	2	3
Botany P	2	4
Chemistry S/P	5	8
Embryology L	1	1
Ethology L	2	2
Microscopic Anatomy P	2	4
Animal Husbandry L	1	1
Elective Courses		
Examinations		
Physics (including the fundamentals of physical radiation protection)		2
Chemistry		2
Zoology		2
Botany of feed crops, poisonous and medicinal plants		2

L= lecture, P= practicals, S= seminar

SWS (CHW)= Semesterwochenstunde (contact hour per week)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Reference: Further information regarding Courses can be found under:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>



ANATOMY II

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
lecture (1 CHW) and practical (2 CHW)

ECTS:
lecture: 1.5; practical: 4

Introduction:
Anatomy of the central nervous system (brain and spinal cord) and sensory organs. Anatomy of the head: oral and nasal cavity, pharynx, laryngeal; muscles, blood vessels, nerves and lymphatic glands.

Overall aims and objectives:

Students should be able to:

- apply the knowledge acquired to prepare the objects
- recognize and explain the links between structure and function

Reading list:

Nickel, Schummer, Seiferle, Lehrbuch der Anatomie der Haustiere, Herausgeber: Parey Bei Mvs, 1. Edition (1997), ISBN-13: 978-3830440178

König/Liebig: Anatomie der Haussäugetiere: Lehrbuch und Farbatlas für Studium und Praxis, Herausgeber: Schattauer, 4. Edition (2008), ISBN-13: 978-3794526505

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

a script of the lecture will be available

Learning recommendations:

see the literature and sources mentioned above

Assessment:

two oral exams during the semester as well as one oral exam within the framework of the Veterinary Intermediate Examination in "Anatomy" after the third semester



BIostatISTICS

Coordinator:

Failing

Instructors:

Failing

Course type:

practical (2 CHW)

ECTS:

3

Prerequisites:

prior knowledge of the fundamentals of mathematics as taught in school

Introduction:

The course is divided into four parts:

1. mathematical fundamentals of biostatistics
2. methods of descriptive statistics
3. elementary probability calculation
4. methods of analytical statistics

Overall aims and objectives:

Students should be able to:

- distinguish between the different types of statistics in relation to their scaling, and, dependent on these, apply the most important methods of descriptive statistics (especially statistical values of one- and two-dimensional statistics, medicinal statistical values, and graphic illustration)
- use the term of probability and apply it to simple veterinary problems. In particular, students will have realised that many procedures of veterinary medicine are of a stochastic rather than a deterministic nature
- use simple methods of analytical statistics to compare dependent and independent samples (Chi-Square-

Test, t-Test, Wilcoxon-Mann-Whitney-Test, Wilcoxon-Test)

- explain statistic calculation formulae and acquire further knowledge of statistical methods with the help of an additional textbook

Reading list:

Lorenz, R. J.: Grundbegriffe der Biometrie, 4. Edition, Gustav Fischer Verlag, Stuttgart, 1996

Sachs, L.: Angewandte Statistik – Anwendung statistischer Methoden, Herausgeber: Springer-Verlag GmbH; 11. überarbeitete und aktualisierte Edition 2004 (2003), ISBN-13: 978-3540405559

Scripts:

the student working group Biomathematics and DV will provide a script on Biometrics

Learning recommendations:

to prepare for assessment, students are advised to use the scripts in combination with their own notes taken during the tutorial

Assessment:

four multiple-choice exams during the semester. Alternatively, students can sit one oral exam, which will include all the subject matter covered by the tutorial, at the end of the semester



BOTANY

Coordinator:
Wissemann

Instructors:
Wissemann

Course type:
practical (2 CHW)

ECTS:
4

Prerequisites:
Participation in the basic lecture “Introduction to Botany”

Introduction:
Poisonous plants are numerous and widely spread in the central European flora. The conscious and unconscious introduction of foreign plants has recently increased the amount of poisonous plants in the flora surrounding us significantly, which has an enormous impact on cases of poisonings in animals. However: “Sola dosis facit venenum”, only the dosage determines whether something is poisonous or not. Therefore this course will introduce the fundamentals of applied plant classifica-

tion. Besides poisonous plants, medicinal and forage plants will be defined, i.e. the botanical diversity of flora. At the end of the course students will be able to define plant species unknown to them and to acquire information concerning their toxicology.

Overall aims and objectives:

Students should be able to:

- define unknown plant species and apply the knowledge acquired during the lecture concerning the structure, biology and function of plants to analyse and assess plant structures
- acquire information on plant toxicology
- deduce assertions concerning the possible toxicology of comparable plant species by using models known to them
- describe the diversity of the plant kingdom as well as its benefits and adverse effects
- allocate plants to the different classes of the plant system based on morphological and anatomical features

2ND SEMESTER

Reading list:

Schmeil-Fitschen, Flora von Deutschland und angrenzender Länder, Herausgeber: Quelle & Meyer; 94. unveränderte Edition (2009), ISBN-13: 978-3494014685

Roth, Daunderer, Kormann: Giftpflanzen, Pflanzengifte, Herausgeber: Nikol Verlags-GmbH; 5. erweiterte Auflage (2008), ISBN-13: 978-3868200096

Scripts:

a script of the lecture will be supplied in electronic form

Self-assessment:

self-assessment questions become redundant because a comparison between the plant at hand, classified by the student, and the illustration found in a standard reference book (e.g. Haupler/Muer: Bild-atlas der Farn- und Blütenpflanzen Deutschlands) will instantly reveal the level of knowledge the student has already acquired...

Learning recommendations:

practice, practice, practice...

Assessment:

a written exam within the framework of the Veterinary Pre-Intermediate Examination in "Botany of feed crops, poisonous and medicinal plants" after the second semester



PRACTICAL INTRODUCTION TO GENERAL CHEMISTRY

Coordinator:
Schindler/Göttlich

Instructors:
assistants of the Department of Chemistry

Course type:
practical (3 CHW) and seminar (2 CHW) in
small groups

ECTS:
8

Prerequisites:
basic knowledge of chemistry

Introduction:

- chemical parameters, concentrations and calculations
- acid and bases, pH-value, chemical balance
- titration, salts, buffer
- redox reactions, galvanic element, redox potentials
- Equilibrium constants, solubility products
- complex formations
- organic compound types, molecule models
- stereo chemistry of organic compounds
- isolation methods of organic bonds, chromatography
- analyses of organic compounds
- natural resources and macromolecules

Overall aims and objectives:

Students should be able to:

- demonstrate basic practical laboratory work competence with regard to good laboratory practice
- name chemical parameters and masses including the nomenclature
- demonstrate a general outline of the principles and procedures of redox reactions and acid-base reactions (including titration)
- demonstrate knowledge and skills in analysis of ions of inorganic and organic compounds
- discuss reaction kinetics and catalysis
- explain the structure of organic compounds

Recommended reading list:

starting summer 2011: Schindler, Göttlich; Chemisches Grundpraktikum im Nebenfach

Scripts:

currently supplied in printed form

Self-assessment:

exercises are available online at:

[http://www.uni-giessen.de/
cms/fbz/fb08/chemie/lehre/nf-che-vl](http://www.uni-giessen.de/cms/fbz/fb08/chemie/lehre/nf-che-vl)

Assessment:

a final exam at the end of the practical during the second semester
a written exam within the framework of the Veterinary Pre-Intermediate Examination in "Chemistry" after the second semester

GENERAL EMBRYOLOGY

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
seminar (1 CHW)

ECTS:
1

Introduction:

Predevelopment:

development and structure of gametes, sexual cycle, fertilization

Primitive development:

blastogenesis, germ leaf development, localization of primitive organs, development of cover and attachments

Placentation:

general placentation science, placentation of domestic mammals

Overall aims and objectives:

Students should be able to:

- define and explain the basic patterns of evolutionary theory and comparative aspects of the primitive development and the placentation of domestic mammals

Reading list:

Schnorr/Kressin: Embryologie der Haustiere, Herausgeber: Enke; Edition: 5., neu bearbeitete Ausgabe (2006), ISBN-13: 978-3830410614

Rüsse/Sinowatz: Lehrbuch der Embryologie der Haustiere, Herausgeber: Parey; ISBN-13: 978-3826332685

Learning recommendations:

see literature recommended above

Assessment:

an oral exam within the framework of the Veterinary Intermediate Examination in "Histology and Embryology" after the third semester



ETHOLOGY

Coordinator:
Würbel

Instructors:
Würbel, Kuhne

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

This lecture will provide a fundamental knowledge of ethology with regard to questions of animal protection and the prevention, diagnosis and therapy of behavioural disorders in domestic animals.

Overall aims and objectives:

Students should be able to:

- name and explain fundamental ethologic terms and concepts
- differentiate between causes and functions of behaviour and discuss

those based on evolutionary theories and mechanisms

- apply fundamental knowledge of phylogenetic and ontogenetic adaptation processes to the evaluation of changes in behaviour due to husbandry
- apply fundamental knowledge of motivation and cognition to the evaluation of the well-being of animals
- classify behavioural problems according to ethological parameters and discuss possibilities of prevention, diagnosis and therapy

Reading list:

Bolhuis JJ, Giraldeau LA: The Behaviour of Animals – Mechanisms, Function and Evolution (1st edn.), Blackwell Publishing, Oxford

McFarland D, Biologie des Verhaltens – Evolution, Physiologie, Psychobiologie, Herausgeber: Spektrum Akademischer Verlag; 2. Edition (1999), ISBN-13: 978-3827409256

Scripts:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

a written exam within the framework of the Veterinary Medical Examination in “Animal Welfare and ethology” after the seventh semester





MICROSCOPIC ANATOMY I

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
lecture and practical (2 CHW)

ECTS:
4

Introduction:
Microscopic anatomy of all organ systems discussed during the second semester in macroscopic anatomy: central nervous system, sensory organs, head

Overall aims and objectives:

Students should be able to:

- demonstrate proficiency with a microscope
- explain the identification and the graphic illustration of histological dissections including diverse microscopic staining techniques

- correlate microscopic and macroscopic anatomy

Reading list:

Eurell/Frappier: Dellmann's Textbook of Veterinary Histology, Verlag Wiley-Blackwell; 6. Edition (2007), ISBN-13: 978-0781741484

Weyrauch/Smollich: Histologiekurs für Veterinärmediziner, Herausgeber: Enke (1998), ISBN-13: 978-3432295015

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see literature and sources indicated above

Assessment:

a written exam during the semester and an oral exam during the Veterinary Intermediate Examination in „Histology and Embryology“ after the third semester

ANIMAL HUSBANDRY

Coordinator:
Erhardt

Instructors:
Erhardt, Lühken

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

During the lecture various husbandry methods concerning agricultural livestock will be discussed: cattle, swine, sheep, goats, horses, poultry and rabbits with regard to application and production factors as well as animal health and product quality; further husbandry methods of dogs with regard to legal regulations.

Overall aims and objectives:

Students should be able to:

- describe and explain husbandry procedures of agricultural livestock concerning various production methods
- explain and quantify their influences on animal health and product quality
- explain husbandry methods of dogs

Reading list:

Methling, W., Unshelm, J.: Umwelt- und tiergerechte Haltung von Nutz-, Heim- und Begleittieren, Herausgeber: Parey Bei Mvs; Auflage: 1 (2002), ISBN-13: 978-3830440000



Hoy, S., Gauly, M., Kiefer, J.: Nutztierhaltung und -hygiene, Herausgeber: Utb; 1. Edition (2006), ISBN-13: 978-3825228019

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see recommended literature; make use of the possibilities offered to visit farms with animal husbandry

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in “Animal Husbandry and Animal Hygiene” after the sixth semester

3RD SEMESTER

	CHW	ECTS
Anatomy III L	2	2
Anatomy III P	4	6
Biochemistry L	3	3
Microscopic Anatomy II P	2	4
Agricultural Science L	2	2
Physiology L	3	4
Animal breeding and genetics L	2	2
Elective Courses		
Examinations		
Anatomy		2
Histology and Embryology		2

L= lecture, P= practicals, S= seminar

SWS (CHW)= Semesterwochenstunde (contact hour per week)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/studium>



ANATOMY III

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
lecture (2 CHW) + practical (4 CHW)

ECTS:
lecture: 2, practical: 6

Introduction:
anatomy of the skin including that of the mammary gland, the hoof and claw; of thoracic, abdominal and pelvic organs; furthermore avian anatomy

Overall aims and objectives:

Students should be able to:

- explain the organs of the greater body cavities, i.e. heart, lungs, digestive organs, as well as urinary and sexual organs
- describe the structure of skin derivatives (mammary gland, hoof, clutch, claw) and describe differences of avian anatomy and domestic mammal anatomy; apply the content of the lecture to the dissection of objects

Reading list:

Nickel/Schummer/Seiferle: Anatomie der Haustiere, Herausgeber: Parey Bei Mvs; 1. Auflage (1997), ISBN-13: 978-3830440178

König/Liebig: Anatomie der Haussäugetiere, Herausgeber: Schattauer; 4. Edition (2008), ISBN-13: 978-3794526505

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see the recommended literature and sources

Assessment:

three oral exams during the semester and one oral exam within the framework of the Veterinary Intermediate Examination in "Anatomy" after the third semester

BIOCHEMISTRY I

Coordinator:
Siebert

Instructors:
Siebert, Scheiner-Bobis, Lütteke, Mazurek

Course type:
lecture (3 CHW)

ECTS:
3

Introduction:

The first part of this lecture on biochemistry will deal with

- the biochemistry of the cell organelles
- properties and functions of proteins and enzymes
- reduction and biosynthesis of carbohydrates
- terminal oxidation of catabolites in the citrate cycle of lipid acids
- lipid and cholesterol metabolisms
- protein-turnover and cleansing of ammonium in the uric cycle
- finally, the respiratory chain in ATP-production or thermogenesis in brown fat tissue of young and hibernating animals

Overall aims and objectives:

Students should be able to:

- name the fundamentals of biochemistry
- show the correlation between patho-biochemistry and enzymatic dysfunction

Reading list:

D. Voet, J.G. Voet, C.W. Pratt, Lehrbuch der Biochemie (and CD-ROM), Herausgeber: Wiley-VCH; 1. Edition (2002), ISBN-13: 978-3527305193



T.M. Devlin, Textbook of Physiological Chemistry (Biochemistry) with Clinical Correlations 6th Edition with Human Molecular Genetics 2nd Edition Set, 6. Edition – October 2006, Herausgeber: John Wiley & Sons, ISBN-13: 978-0-47010989-2

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

see Vet-Learn:

<https://vet-learn.uni-giessen.de/ilias3/>

Self-assessment:

Stud IP / Vet-Learn

Assessment:

an oral exam within the framework of the Veterinary Intermediate Examination in “Biochemistry” after the fourth semester



MICROSCOPIC ANATOMY II

Coordinator:
Bergmann

Instructors:
Arnhold, Bergmann and assistants

Course type:
practical (2 CHW)

ECTS:
4

Introduction:
Microscopic anatomy of the organ systems discussed during the third semester in macroscopic anatomy: skin, mammary gland, hoof, clutch and claw and organs of the thoracic, abdominal and pelvic cavities.

Overall aims and objectives:

Students should be able to:

- recognize and depict histological specimens
- deduce and, by linking macroscopic and microscopic anatomy, show

connections between structure and function

Reading list:

Eurell/Frappier: Dellmann's Textbook of Veterinary Histology, Verlag Wiley-Blackwell; 6. Edition (2007), ISBN-13: 978-0781741484

Weyrauch/Smollich: Histologiekurs für Veterinärmediziner, Herausgeber: Enke (1998), ISBN-13: 978-3432295015

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see recommended literature and sources

Assessment:

a written exam during the semester and an oral exam within the framework of the Veterinary Intermediate Examination in "Histology and Embryology" after the third semester

AGRICULTURAL SCIENCE

Coordinator:
FB09

Instructors:
Ströde

Course type:
lecture (2 CHW), 1 excursion

ECTS:
2

Introduction:

The first part of the lecture will focus on agricultural livestock. Animal-orientated production processes will be illustrated. As a part of this, the illustration of animal species, the introduction to organisational structures, including methods of animal husbandry and the presentation of products (meat, milk, wool, etc) will be discussed. The efficiency of production methods will be presented. The syllabus will also include an introduction to legal regulations concerning animal husbandry in agriculture.

The second part of the lecture is part of the studies in functional business management and will deal with the fundamentals of business administration and applied business studies. This will include an introduction to the basic terminology of economics and accounting. The major topics included will be financial management, annual closure, balance-extraction calculation, gain-loss calculation and cash-basis accounting.

The students will get to know methods of cost-benefit calculation as well as investment calculation. The teaching unit practice management will centre on the veterinary surgery as a business model. It will provide an overview on the organisa-

tion and legal forms of the veterinary practice, including tariff and tax law and marketing methods.

Overall aims and objectives:

Students should be able to:

- define and explain the methods of livestock production in agriculture (organisational forms, husbandry methods, etc.)
- evaluate the efficiency of agricultural methods in livestock production
- define basic terms of business studies
- apply methods of controlling (e.g. accounting and finances)
- explain economic calculation methods (e.g. investment calculation)
- apply the methods of practice management

Reading list:

Kuhlmann: Einführung in die Betriebswirtschaftslehre für den Agrar- und Ernährungsbereich

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

The topic will be included in the oral exam taken within the framework of the Veterinary Intermediate Examination in "Animal breeding and Genetics including animal evaluation" after the fourth semester

PHYSIOLOGY

Coordinator:

Diener, Gerstberger

Instructors:

Diener, Gerstberger, Roth, Rummel

Course type:

lecture (3 CHW) + additions to the lecture (1 CHW)

ECTS:

4

Introduction:

Physiologic fundamentals of important bodily functions in domestic animals (especially mammals) will be covered in this lecture of the 3rd semester (3 + 1 CHW). The following organ and functional systems will be dealt with in detail:

- fundamentals of cell physiology: transport systems, intracellular signal transduction
- neurophysiology; membrane potentials, excitation and transmission; neurotransmitters and receptors
- physiology of muscles; (supra-)spinal control of movement; proprio-receptors, pathophysiology
- the vegetative nervous system: sympathetic nervous system, parasympathetic nervous system and enteric nervous system
- physiology of senses: general basics; sensory modalities of skin; eye, hearing and vestibular organ; taste and smell; pathophysiology
- physicochemistry of blood, physicochemistry of erythrocytes; leucocytes; blood clotting; pathophysiology
- immunology: the system of cellular and humoral specific and unspecific defence
- cardiovascular: excitation and me-

chanics of the heart; artery and venous system; microcirculation; peripheries and central circulatory regulation; pathophysiology

- physiology of kidney function: glomerular function; tubular resorption and secretion; hormonal control; acid and base management; pathophysiology
- salt and water regulation: fluid compartments; hypothalamic control

Overall aims and objectives:

Students should be able to:

- understand the physiology of single organ systems, including their cellular and biochemical fundamentals, as well as certain physical laws
- deduct and recognize integrative correlations: i.e. understand the cross-linking of organ systems by the superior control of the nervous system, the immune system and the endocrine system
- receive a first insight into cellular and systematic mechanisms of pathophysiological developments in animal organisms

Reading list:

v. Engelhardt, Breves: Physiologie der Haustiere, Verlag: Enke; 3. vollständig überarbeitete Auflage 2010 (2009), ISBN-13: 978-3830410782

Speckmann, Hescheler, Köhling: Physiologie, Urban & Fischer Verlag; 5. Auflage (2008), ISBN-13: 978-3437413186

Klinke, Silbernagel: Lehrbuch der Physiologie, Verlag: Thieme, Stuttgart; 5. Auflage (2005), ISBN-13: 978-3137960058

3RD SEMESTER

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Scripts:

An extensive script containing numerous slides of the lecture can be bought at the beginning of the semester

Self-assessment:

Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Learning recommendations:

see the preceding four bullets

Assessment:

an oral exam within the framework of the Veterinary Intermediate Examination in “Physiology” after the fourth semester



ANIMAL BREEDING AND GENETICS

Coordinator:
Erhardt

Instructors:
Erhardt

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

The lecture will cover the fundamentals of animal breeding and genetics, taking into account biotechnological methods and legal regulations.

Overall aims and objectives:

Students should be able to

- characterise the genetic structures of an individual and a population on several levels
- describe the spectrum of properties and the heredity of qualitative and quantitative characteristics
- explain the success of selection, the genetic evaluation and the mating systems.
- assess possible effects of selection
- deal with the occurrence of hereditary defects and assess legal regulations of animal breeding

Reading list:

Schüler, L., Swalve, H., Götz, K.-U.: Grundlagen der Quantitativen Genetik, Verlag: UTB (2001), ISBN-13: 978-3800127559

von Lengerken, G., Ellendorf, F., von Lengerken, J. (Hrsg.): Tierzucht, Verlag: Ulmer (Eugen); 6. neu bearbeitete Auflage (2006), ISBN-13: 978-3800147809

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

see recommended literature

Assessment:

an oral and a practical exam within the framework of the Veterinary Intermediate Examination in “Animal breeding and genetics” after the fourth semester



4TH SEMESTER

	CHW	ECTS
Propaedeutics L	2	2
General Bacteriology and Mycology L	1	1
Biochemistry L	3	3
Biochemistry P	2,5	4
Biochemistry S	1,5	2
Animal Nutritional Sciences L	1	1
Animal Nutritional Sciences P	2	3
Physiology L	3	3
Physiology P/S	4	6
Animal Welfare L	2	2
Animal Breeding L	2	2
Animal Breeding P	2	3
Virology L	1	1
Elective Courses		
Examinations		
Physiology		2
Biochemistry		2
Animal Breeding and Genetics including the assessment of animals		2

L= lecture, P= Practical, S=seminar

CHW= Semesterwochenstunde (contact hour per week)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/studium>

PROPAEDEUTICS

Coordinator:
Neiger

Instructors:
Neiger, Kramer, Fey, Litzke, Lierz,
Wehrend, Doll, Reiner

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

The lecture of the 4th semester will deal with the clinical assessment methods of all relevant species and their differences. Normal results are important to recognize changes; therefore, these will be covered in propaedeutics.

Overall aims and objectives:

Students should be able to:

- describe normal findings concerning all species they have been introduced to
- list a complete examination scheme in internal medicine, surgery and reproductive medicine
- work problem-oriented
- apply evidence-based medicine

Reading list:

Baumgartner, Walter: Klinische Propädeutik der Haus- und Heimtiere, Verlag: Parey Bei Mvs; 7. vollständig überarbeitete und erweiterte Auflage (2009), ISBN-13: 978-3830441755

Kramer (Hrsg.): Kompendium der Allgemeinen Veterinärchirurgie, VET-Kolleg, Verlag: Schlütersche; 1. Auflage (2003), ISBN-13: 978-3877067437

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

a revision of the theoretical subject matter before the tutorial in the fifth semester

Assessment:

a practical exam within the framework of the Veterinary Medical examination in "Clinical Propaedeutics" of one animal species after the fifth semester



GENERAL BACTERIOLOGY AND MYCOLOGY

Coordinator:
Baljer, Bauerfeind

Instructors:
Baljer, Bauerfeind and assistants

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
The lecture will cover the fundamentals of bacteriology and mycology, infection and epidemic studies including infection immunology.

Overall aims and objectives:
Students should be able to:

- explain the structure of bacteria and fungi
- define and correctly apply basic terms of microbiology, epidemiology and immunology

- explain mechanisms of the pathogenesis of microorganisms
- meaningfully apply anti-infectives
- interpret the causes of epidemics
- explain the pathogeneses of infective diseases
- rate the protective results of vaccinations

Reading list:

Rolle, Mayr: Mikrobiologie, Infektions- und Seuchenlehre, Enke-Verlag, 8. überarbeitete Auflage (2006), ISBN-13: 978-3830410607

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

the script „Allgemeine Infektions- und Seuchenlehre“ of the student body

Self-assessment:

self-assessment questions can be found on the website of the Department of Animal Hygiene and Diseases:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/ihyt/Lehre/fragenkataloge

Learning recommendations:

Students are advised to extend the script during the lecture, to revise and expand the subject matter with the help of books and the self-assessment questions.

Rolle, Mayr: Mikrobiologie, Infektions- und Seuchenlehre, Enke-Verlag

Assessment:

an oral exam (20%) within the framework of the Veterinary Medical Examination in „Bacteriology and Mycology” after the fifth semester

BIOCHEMISTRY II

Coordinator:

Siebert

Instructors:

Siebert, Scheiner-Bobis, Lütteke, Mazurek

Course type:

lecture (3 CHW)

ECTS:

3

Introduction:

This second part of the lecture will deal with

- processes of oxygen and CO₂ transport in blood,
- biosynthesis and reduction of porphyrins and bile acids,
- nucleic acids and protein biosynthesis,
- molecular biological methods relevant to veterinary medicine with regard to transgenic animals
- signal transfer between cells and organs

- hormones and hormone-regulated circles
- metabolic reactions of organs in normal, pathological or extreme physiological conditions

Overall aims and objectives:

Students should be able to:

- explain the basic principles of biochemistry
- prove correlations between patho-biochemistry and enzymatic dysfunction

Reading list:

D. Voet, J.G. Voet, C.W. Pratt, Lehrbuch der Biochemie (mit CD-ROM), Verlag: Wiley-VCH; 1. Auflage (2002), ISBN-13: 978-3527305193

T.M. Devlin, Textbook of Biochemistry with Clinical Correlations 6th Edition with Human Molecular Genetics 2nd Edition Set, 6. Auflage – October 2006, Verlag: John Wiley & Sons, ISBN-13: 978-0-470-10989-2

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

see Vet-learn:

<https://vet-learn.uni-giessen.de/ilias3/>

Self-assessment:

Stud IP / Vet-Learn

Assessment:

an oral exam within the framework of the Veterinary Intermediate Examination in “Biochemistry” after the fourth semester

BIOCHEMISTRY PRACTICAL

Coordinator:
Siebert

Instructors:
Scheiner-Bobis, Siebert, Lütteke, Burg-Roderfeld, Eckert, Petkova, Rojas, Stötzel

Course type:
seminar (1,5 CHW) + practical (2,5 CHW)
per day

ECTS:
6

Introduction:
The course will provide an introduction to practical biochemistry for students of veterinary medicine. The course topics include a theoretical and an experimental part.

1. the meaning of phosphate for cell biology
2. the meaning of biological buffers
3. the properties of proteins
4. enzymes and their properties

5. nucleic acids and protein biosynthesis
6. protein- and nitrogen-oxygen-interchange
7. carbohydrate metabolism
8. lipids and energy metabolism

The approach to the topics is accompanied by a demonstration and application of established biochemical and molecular biological methods, e.g. photometry, methods of determination for various metabolites, electrophoretic fractionation of proteins or DNA, restriction analysis of DNA etc.

Overall aims and objectives:

Students should be able to:

- explain and demonstrate biochemical procedures and methods combined with knowledge of metabolisms, furthermore demonstrate cell functions with basic methods of analysis
- demonstrate an understanding of biochemical processes

Scripts:

practical biochemistry for veterinarians

Self-assessment:

can be found online at:

<https://vet-learn.uni-giessen.de>

Assessment:

ten oral exams after the seminars during the semester, weekly retrials for written and oral exams; two retrials for experimental assignments.

Oral and practical exam within the framework of the Veterinary Intermediate Examination in "Biochemistry" after the fourth semester



ANIMAL NUTRITIONAL SCIENCE

Coordinator:
Eder

Instructors:
Eder

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

Definition of and introduction to animal nutritional sciences according to origin and usages.

The lecture will deal with the most important animal feed groups (green feed and preserve, straw, tubers and roots, grain and seeds, feed from industrial processing of plants, feed on microbial basis, feed of animal origin, feed lipids, catering waste and by-products of the baking industry, additives and extending ingredients) with regard to chemical (composition, nutritive and anti nutritive ingredients) and physical (structure) properties and applicability (usage recommendations) for mono gastric and ruminant animals.

Important analyses of feed (Weender Analytics, Van Soest Analytics)

Feed preservation and storage,
Feed spoilage

Feed assessment criteria

Methods of feed production

Feed safety and regulations

The meaning of mixed feeding stuff

Overall aims and objectives:

Students should be able to:

- demonstrate knowledge of chemical and physical properties of animal feed including its production, conservation and storage
- demonstrate knowledge of the applicability of animal nutrition groups for feeding of agricultural livestock
- explain established laboratory methods used for the evaluation of feed
- demonstrate knowledge of the legal framework for the usage of feed and feed additives
- demonstrate knowledge of rationing regarding the aspect of fulfilment of demand and cost minimization

Reading list:

Jeroch, H., Drochner, W., Simon, O.: Ernährung Landwirtschaftlicher Nutztiere; Ulmer-Verlag, Stuttgart 1999, ISBN 3-8252-8180-9

Jeroch, H., Flachowsky, G., Weissbach, F.: Futtermittelkunde; Gustav-Fischer-Verlag Jena 1993, ISBN 3-334-00384-1

Electronic sources:

PowerPoint presentations

Learning recommendations:

We recommend studying the PowerPoint presentation before attending the lecture and acquiring further information concerning the subject matter with the help of the recommended books

Assessment:

a written exam within the framework of the Veterinary Medical Examination in "Animal nutrition" after the sixth semester

PRACTICAL IN ANIMAL NUTRITIONAL SCIENCES

Coordinator:
Eder

Instructors:
Eder and assistants

Course type:
practical (2 CHW)

ECTS:
3

Introduction:

The practical course will accompany the one-hour lecture in “Animal Nutritional Sciences”.

Various types of animal feed will be examined with the help of the Weender-Analysis in order to identify nutrient and energy values. Aspects of the quality of the feed, the problematic issue of unwanted and banned supplements, as well as the differentiation of contamination and tampering will be demonstrated by experiments. The evaluation of green feed, straw and hay will be covered during a practical exercise. Microscopic assessments on starch, contamination and the occurrence of animal components in animal nutrition and mixture feeds will be conducted.

Overall aims and objectives:

Students should be able to:

- provide knowledge on processing, preserving and storage of animal feed including relevant legal aspects of feed restrictions
- apply methods to evaluate and characterise animal feed

Reading list:

Kamphues, J., Coenen, M., Iben, Chr., Kienzle, E., Pallauf, J., Simon, O., Wanner, M., Zentek, J.: *Supplemente zu Vorlesungen und Tutorialen in der Tierernährung*; 11. Auflage, Schaper Verlag Alfeld-Hannover 2009, ISBN 978-3-7944-0223-6

Kirchgessner, M., Roth, F.X., Schwarz, F.J., Stangl, G.I.: *Tierernährung*; 12. Auflage, DLG-Verlag Frankfurt/Main 2008, ISBN 978-3-7690-0703-9

Electronic sources:

PowerPoint presentations

Scripts:

a script and further background information will be supplied via Stud-IP

Learning recommendations:

We recommend to prepare every practical session by reading the script and the background information and to engross the content of the practical subsequently

Assessment:

an exam at the end of the course; also integrated into the written exam of the Veterinary Medical Examination in “Animal nutrition” after the sixth semester



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PHYSIOLOGY

Coordinator:

Diener, Gerstberger

Instructors:

Diener, Gerstberger, Roth

Course type:

lecture (3 CHW)

ECTS:

3

Introduction:

The lecture of the fourth semester (3 + 1 CHW) will convey the physiologic fundamentals of important bodily functions of domestic animals (especially mammals). The following organ and functional systems will be dealt with in detail:

- physiology of respiration: basics; respiration mechanisms; diffusion and gas transport; regulation of respiration; pathophysiology.
- acid-base control: fundamentals of physical chemistry; acidosis and alkalosis; compensatory mechanisms; kidney and lung as target organs
- physiology of digestion: nutrition absorption and function of the salivary glands, proventricular digestion in ruminants, secretion, resorption and motor activity of the gastrointestinal tract; enteric nerve and hormone system; pathophysiology
- energy and thermal control: closed circuits; temperature cessions and production; calorimetric science and basal metabolic rate; pathophysiology
- endocrinology: basics; hormones of thyroid gland and parathyroid, adrenal, gonadal, heart and kidney, pituitary and hypothalamus; pathophysiology
- lactation: milk production and hormonal control; colostrum



Overall aims and objectives:

Students should be able to:

- understand the physiology of particular organ systems including their cellular and biochemical fundamentals as well as some physical regularities
- deduce and recognize integrative correlations, i.e. the interconnection of the various organ systems due to the control of the nervous system; understand the immune system and, partially, the endocrine system
- receive first insights into the cellular and systematic mechanisms which cause pathophysiological changes of the animal organism

Reading list:

v. Engelhardt, Breves: Physiologie der Haustiere, Verlag: Enke; 3. vollständig überarbeitete Auflage 2010 (2009), ISBN-13: 978-3830410782

Speckmann, Hescheler, Köhling: Physiologie, Urban & Fischer Verlag; 5. Auflage (2008), ISBN-13: 978-3437413186

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>
Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Scripts:

a detailed script that includes numerous slides of the lecture can be bought at the beginning of the semester

Self-assessment:

Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Learning recommendations:

see the four bullets above

Assessment:

an oral exam within the framework of the Veterinary Intermediate Examination in “Physiology” after the fourth semester



PHYSIOLOGY PRACTICAL

Coordinator:

Diener, Gerstberger

Instructors:

Diener, Gerstberger, Roth, Rummel et al.

Course type:

seminar with practicals (4 CHW)

ECTS:

6

Introduction:

During the “Physiological practical with seminar”, which consists of 10 course units of 4 hours each, the subject matter of, for example, one organ system will be discussed in condensed form. The students (in small groups at a maximum of 11 each) will prepare a topic and will subsequently be questioned on this. The seminar will be followed by practical exercises (in small groups of 2-3 students) on human and/or animal specimens, to characterize the organ system mechanically or diagnostically.

The content of the lecture, mostly of the 3rd but also of the 4th semester, will be engrossed with the help of the condensed seminar, the oral assessment and the matching practical.



The seminars/practicals will deal with:

- the physiology and physical chemistry of the red blood cell
- the physiology of the white blood cells; blood clotting
- neurophysiology: nerves and reflexes
- muscle physiology
- the physiology of the heart
- the physiology of the circulation
- respiratory physiology
- sensory physiology
- energy and thermal reception balance
- digestive physiology: resorption

Overall aims and objectives:

Students should be able to:

- apply and understand comprehension-based or simple diagnostic methods of assessment

Reading list:

v. Engelhardt, Breves: Physiologie der Haustiere, Verlag: Enke; 3. vollständig überarbeitete Auflage 2010 (2009), ISBN-13: 978-3830410782

Speckmann, Hescheler, Köhling: Physiologie, Urban & Fischer Verlag; 5. Auflage (2008), ISBN-13: 978-3437413186

Klinke, Silbernagel: Lehrbuch der Physiologie, Verlag: Thieme, Stuttgart; 5. Auflage (2005), ISBN-13: 978-3137960058

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Scripts:

a detailed manual that introduces the practical exercises can be bought at the beginning of the semester

Self-assessment:

Haschke, Diener (2007). Multimedia Physiologie – Ein interaktives Lernprogramm für Veterinärmediziner Version 3.2. Enke Verlag im MVS Medizinverlag, Stuttgart

Learning recommendations:

see the four bullets above

Assessment:

oral preliminary test on tutorial days; an oral exam within the framework of the Preliminary Intermediate Examination in “Physiology” after the fourth semester

ANIMAL WELFARE

Coordinator:
Würbel

Instructors:
Würbel, Kuhne

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

A general introduction to animal welfare and applied ethology. Fundamentals of regulations, ethics and science concerning animal welfare; ethological approaches and methods to evaluate the humane keeping and treatment of animals; case studies on problematic issues concerning animal welfare.

Overall aims and objectives:

Students should be able to:

- name the most important fundamentals of the Animal Protection Act
- apply the Animal Protection Act on concrete examples and discuss those from the perspective of animal welfare
- name the most important ethical fundamentals of the Animal Protection Act and argue case studies with regard to ethical principles
- explain the most important ethical approaches to the evaluation of humane conditions concerning animal husbandry

Reading list:

Samraus HH, Steiger A, Das Buch vom Tierschutz, Verlag: Enke, Stuttgart (1997), ISBN-13: 978-3432294315

Scripts:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

a written exam within the framework of the Veterinary Medical Examination in “Animal Welfare and Ethology” after the seventh semester



ANIMAL BREEDING AND GENETICS

Coordinator:
Erhardt

Instructors:
Erhardt, Dzapo

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:
Students will get to know the specific requirements and prerequisites as well as the implications concerning the breeding of agricultural livestock, as well as horses, dogs and cats.

Overall aims and objectives:

Students should be able to:

- describe the domestication, uses and breeds of agricultural livestock,
- explain efficiency tests and breed value estimation,
- rate and describe breeding programmes and breeding methods using biotechnology,
- transfer these to the breeding of pets

Reading list:

Kräußlich, H., Brem, G.: Tierzucht und Allgemeine Landwirtschaftslehre für Tiermediziner, Verlag: Enke, 1. Auflage (1997), ISBN-13: 978-3432266213

Geldermann, H. (Hrsg.): Tier-Biotechnologie. Ulmer Verlag, 2005, Verlag: UTB; 1. Auflage (2005), ISBN-13: 978-3825282837

Scripts:

additional lecture material will be supplied and updated by the student body

Learning recommendations:

see reading list

Assessment:

an oral and a written exam within the framework of the Veterinary Medical Examination in “Animal breeding and Genetics including animal rating” after the fourth semester

PRACTICAL IN ANIMAL BREEDING AND GENETICS

Coordinator:
Erhardt

Instructors:
Dzapo and assistants

Course type:
practical (2 CHW)

ECTS:
3

Introduction:
The general and specific fundamentals of animal rating and evaluation will be explained; students practice these on various animal species.

Overall aims and objectives:

Students should be able to:

- assess agricultural livestock on the basis of age, weight and appearance with regard to usage and breeding value

Reading list:

Samraus, H.H.: Atlas der Nutztierassen, Verlag: Ulmer Eugen Verlag; 5. Auflage (2000), ISBN-13: 978-3800173488

Brem, G.: Exterieurbeurteilung Landwirtschaftlicher Nutztiere, Verlag: Ulmer (Eugen) (1998), ISBN-13: 978-3800143726

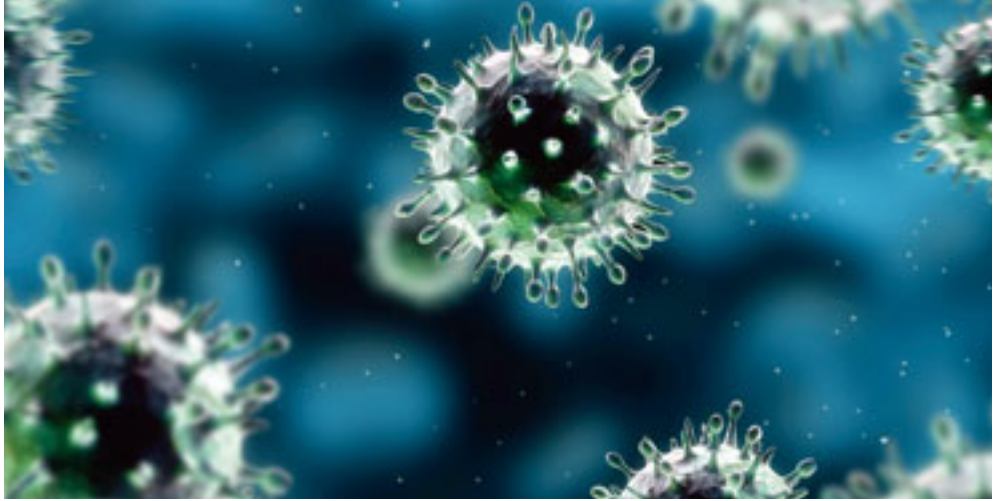
Learning recommendations:

see reading list

Assessment:

a written exam at the end of the practical, as well as oral and practical exams within the framework of the Veterinary Intermediate Examination in “Animal breeding and genetics including animal rating” at the end of the fourth semester





GENERAL VIROLOGY

Coordinator:
Rümenapf, Thiel

Instructors:
Rümenapf, Thiel

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
The lecture will cover the fundamentals of molecular biology and immune biology of viruses. General aspects of pathogenesis, prevention and epidemiology with regard to diseases caused by viruses will be discussed.

Overall aims and objectives:
Students should be able to:

- explain the fundamentals of virology, such as the properties of viruses and the causation and development of diseases through viruses

Reading list:
Rolle, Mayr: Mikrobiologie, Infektions- und Seuchenlehre, Enke-Verlag, 8. überarbeitete Auflage (2006), ISBN-13: 978-3830410607

Electronic sources:
see StudIP:
<https://studip.uni-giessen.de/studip/>

Self-assessment:
an agenda is available

Learning recommendations:
the lecture and the reading list recommended above

Assessment:
a written exam within the framework of the Veterinary Medical Examination in "Virology" after the fifth semester

5TH SEMESTER

	CHW	ECTS
Bacteriology, specific L	2	2
Bacteriology/Virology P	2	3,5
Parasitology L	3	3
Parasitology P	2	3,5
Pathology, general L	3	3
Pharmacology and Toxicology L	3	3
Propaedeutics P	4	5
Animal Nutrition L	2	2
Animal Hygiene L	2	2
Virology, specific L	2	2
Elective Courses		
Examinations		
Bacteriology and Mycology		2
Virology		2
Clinical Propaedeutics		2
Pharmacology and Toxicology		1

L= lecture, P= practical, S=seminar

CHW = contact hour per week (Semesterwochenstunde)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>

SPECIFIC BACTERIOLOGY AND MYCOLOGY

Coordinator:
Baljer, Bauerfeind

Instructors:
Baljer, Bauerfeind and assistants

Course type:
lecture (2 CHW)

ECTS:
2

Prerequisites:
participation in the lecture “Bacteriology and Mycology (general)” in the 4th semester

Introduction:
The most relevant bacterial and fungal infections of animals will be discussed in the lecture. The content of the lecture is divided into pathogen characteristics, taxonomy, epidemiology, pathogenesis and clinical diagnoses, as well as therapy and prophylaxis.

Overall aims and objectives:
Students should be able to:

- taxonomically classify germs,
- deduce the symptoms of infectious diseases,
- explain the dangers of bacteria and fungi,
- define habitats of germs,
- list pathogen diagnosis procedures
- give specific therapeutic and preventive recommendations,
- explain epidemiological aspects of infectious diseases (reservoirs, prevalence, transmission paths, etc.)

Reading list:
Rolle, Mayr: Mikrobiologie, Infektions- und Seuchenlehre, Enke-Verlag 8. überarbeitete Auflage (2006), ISBN-13: 978-3830410607

Songer, Post: Veterinary Microbiology, Verlag: Saunders (2004), ISBN-13: 978-0721687179

Electronic sources:
see StudIP:
<https://studip.uni-giessen.de/studip/>

Scripts:
the student body will provide the script “Spezielle Bakteriologie und Mykologie”

Self-assessment:
a questionnaire can be found online, at the homepage of the department

Learning recommendations:
Students are advised to extend the script during the lecture; to revise the syllabus with the help of the books mentioned above and to prepare for the exam in time

Assessment:
an oral exam (60%) within the framework of the Veterinary Medical Examination in “Bacteriology and Mycology” after the fifth semester

MICROBIOLOGICAL PRACTICAL

IN BACTERIOLOGY, MYCOLOGY AND IMMUNOLOGY

Coordinator:

Bauerfeind, Baljer

Instructors:

Bauerfeind, Baljer and assistants

Course type:

practical (2 CHW)

ECTS:

3,5

Prerequisites:

participation in the lecture “Bacteriology and Mycology” (general and specific part).

Introduction:

Students receive training in dealing with pathogenic bacteria and fungi; in particular, they will learn simple methods to diagnose infections caused by bacteria and fungi. These methods will comprise microscopic, cultivational, biochemical and serological test methods.

Overall aims and objectives:

Students should be able to:

- observe and name the agents that cause bacterial and fungal diseases
- carry out and evaluate simple microbiological and serological working methods
- safely handle pathogenic microorganisms

Reading list:

Rolle, Mayr: Mikrobiologie, Infektions- und Seuchenlehre, Enke-Verlag 8. überarbeitete Auflage (2006), ISBN-13: 978-830410607

Quinn et al: Clinical Veterinary Microbiology, Verlag: Elsevier Ltd, Oxford; Auflage: 2Rev ed. (2010), ISBN-13: 978-0723432371

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Self-assessment:

Answer the following questions:

- Which culture media are used in microbiology?
- Which criteria are used to assess microbial cultures?
- Do I know the microscopic methods of assessment?
- How are bacteria stained (e.g. staining according to Gram, Köster, Ziehl-Neelsen) and evaluated?
- How to read a coursed row (Bunte Reihe)?
- How is the OSA Colour System applied?
- Which direct and indirect verification methods exist and how are they evaluated?

Learning recommendations:

Students are advised to extend the script during the practical and to read it before the exam; the script may be used during the exam

Assessment:

a practical in-session exam at the end of the tutorial will provide a partial grade (20%) within the framework of the Veterinary Medical Examination in “Bacteriology and Mycology” after the fifth semester

PARASITOLOGY

Coordinator:
Grevelding

Instructors:
Grevelding, Bauer, Tenter

Course type:
lecture (3 CHW)

ECTS:
3

Introduction:

The lecture will provide an overview of endoparasites and ectoparasites (arthropods, helminths, protozoans) with specific regard to their relevance for veterinary medicine. Students will be introduced to basic principles of morphology and the evolutionary biology of important parasitic organisms, as well as immune reactions to parasitic diseases. Information on epidemiology, the meaning, development, clinical/pathological appearances, the diagnosis and treatment of parasitic diseases of animals will be covered. Concerning parasitic diseases that apply to several hosts, those aspects that apply to human medicine will be discussed as well.

Overall aims and objectives:

Students should be able to:

- explain parasitic relations
- describe the biology of parasites and the disease patterns they cause
- explain diagnostic procedures and develop treatment methods

Reading list:

Eckert, Friedhoff, Zahner, Deplazes: Lehrbuch der Parasitologie, Verlag: Enke; 2. vollständig überarbeitete Auflage (2008), ISBN-13: 978-3830410720

Schnieder (Hrsg.): Veterinärmedizinische Parasitologie, Verlag: Parey im MVS Medizinverlag Stuttgart, 6. vollständig überarbeitete und erweiterte Auflage (2006), ISBN-13: 978-3-8304-4135-9

Electronic sources:

If needed, those will be provided online in the form of downloadable word-documents and PDF-files:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/parasitologie/lehre/down

Scripts:

an overview of the syllabus will be provided at the beginning of the lecture

Self-assessment:

will be provided in the form of short tests during the parallel course Practical Parasitology

Learning recommendations:

reading list, lecture and tutorial sources

Assessment:

a practical and an oral exam within the framework of the Veterinary Medical Examination in "Parasitology" after the sixth semester

PRACTICAL PARASITOLOGY

Coordinator:
Grevelding

Instructors:
Grevelding, Bauer, Quack, Tenter

Course type:
practical (2 CHW)

ECTS:
3,5

Prerequisites:

1. Participation in the lecture “Parasitology” during the fifth semester
2. Knowledge of general health and safety guidelines, of the correct conduct in the laboratory and the handling of potentially (human) infectious material
3. Basic knowledge of the use of a microscope
4. Preparation in advance of the topic that is to be discussed (see below)

Introduction:

After an introduction to general procedures, students will examine prepared objects of parasites macroscopically and microscopically. Furthermore, simple assessments methods to prove parasitic development stages are conducted.

The tutorials consist of 3 units with a total of 12 topics:

- (I) “General Parasitology”; examples will show the morphology of parasitic protozoa und helminths/helminthes and arthropods including their developmental stages;
- (II) “Specific Parasitology”; important endoparasites and ectoparasites including their agents will be explained with regard to different hosts and, with the help of numerous case studies, the parasitic diagnostics, treatments and preventive procedures will be explained;
- (III) “Diagnostic Tutorials”; important topics and specimens are revised in order to engross knowledge and prepare students for the exam.



Overall aims and objectives:

Students should be able to:

- apply the fundamentals that have been theoretically acquired during the lecture on morphology, development cycles and ways of infection; on (sub)clinical, pathologic-anatomical and economical effects of faunal parasites, their zoonotic meaning, (direct and/or indirect) diagnostics as well as the fight against the disease
- explain and apply parasitic and epidemiological nomenclature
- systematically distinguish animal phylum
- recognize and describe parasitic protozoa (flagellates, apicomplexa), adult helminths (trematodes, cestodes, nematodes) and arthropods (acari, insecta) by means of morphologic characteristics
- use basic dichotomous keys
- describe and recognize developmental stages of parasitic protozoa, helminths and arthropods
- define endoparasites and ectoparasites according to their tissue/organ localization in hosts (ruminants, equids, pigs, carnivores, poultry, bees) and to name their host specificity
- name, describe and apply direct and/or indirect (serologic) diagnostic methods
- explain and rate the indication and efficiency of various licensed antiparasitics

Reading list:

Eckert, Friedhoff, Zahner, Deplazes: Lehrbuch der Parasitologie, Verlag: Enke; 2. vollständig überarbeitete Auflage (2008), ISBN-13: 978-3830410720

Schnieder (Hrsg.): Veterinärmedizinische Parasitologie, Verlag: Parey im MVS Medizinverlage Stuttgart, 6. vollständig überarbeitete und erweiterte Auflage (2006), ISBN-13: 978-3-8304-4135-9

Electronic sources:

the Homepage of the Department of Parasitology contains links to picture and text files:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/parasitologie/links/paraweb

Scripts:

Bauer: Praktikum der veterinärmedizinischen Parasitologie. Verlag Ferber'sche Uni-Buchhandlung Giessen (second-hand)

Self-assessment:

The learning success will be assessed during the course of the practical in the form of four written multiple choice tests

Learning recommendations:

see the above

Assessment:

Multiple-choice tests during the semester and one practical, written and oral exam within the framework of the Veterinary Medical Examination in "Parasitology" after the sixth semester



GENERAL PATHOLOGY

Coordinator:
Reinacher

Instructors:
Reinacher, Herden, Köhler, Henrich,
Huisinga, Hecht

Course type:
lecture (3 CHW)

ECTS:
3

Introduction:
A systematic description of pathological conditions and processes in organisms. An explanation of the nomenclature and definitions of pathological conditions and processes.

Overall aims and objectives:

Students should be able to:

- define and explain principles and mechanisms
- name and describe of the systematic classification of pathological processes and conditions of the organism

Reading list:

McGavin, Zachary: Pathologie der Haustiere; Allgemeine, spezielle und funktionelle Veterinärpathologie, Verlag: Elsevier, München (2009), 1. Auflage 2009, ISBN-13:978-3437582509

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

a script of "Allgemeine Pathologie" will be provided by the student body



Learning recommendations:

Students are advised to complement the outlines of the lecture with the most important content of teaching and compare this to the script and books. Question all vague matters and ask the instructors for explanations

Assessment:

a practical and an oral exam within the framework of the Veterinary Medical Examination in “General Pathology and specific pathologic anatomy and Histology” in the eleventh semester

GENERAL PHARMACOLOGY

Coordinator:
Geyer

Instructors:
Petzinger, Geyer, Alber

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

- The general and biochemical pharmacology and toxicology lecture will cover the fundamentals of drug and toxin effects on the basis of receptor-substance interaction (agonistic, antagonistic, partial and inverse antagonists), of tissue and ligand specific receptor equipment with regard to dosage and reaction profiles, intercellular signal transmission and the individualities of the effector systems.
- Correlations of intoxication and detoxification reactions, of distribution and

elimination, of transport and storage will be depicted, further, drug-substance interactions, characteristics of pharmacokinetics that apply to animals, the meaning of polymorphism and genetic defects in proteins, furthermore basics of polymorphism in organ toxic reactions. Examples of receptor pathology will be given.

- The lecture will cover knowledge of molecular causes of diseases and their treatment by drug therapy. An objective of the lecture is the elucidation of causal versus symptomatic forms of therapy including the usage of so-called antidotes.
- The characteristics of blood levels in dependency of application are depicted, furthermore an introduction to practical application.
- Fundamentals of biological and toxicological mechanisms in cancer genesis, tumour promotion, including onco-suppressor gene and tumour-suppressor gene. None-dosage related reactions to drugs, i.e. allergies.
- Regulatory toxicology, furthermore embryo toxicity and teratogenesis.
- Fundamentals of drug addiction and further potentially addictive drugs.

The fundamentals of the so-called specific therapy types in pharmaceutical regulations will be explained, i.e. homeopathic medicine, phytotherapy and anthroposophical drug therapy, furthermore the placebo and nocebo terms will be explained. Obscure and irrational alternative therapies (e.g. Bach flower therapy, Hildegard von Bingen’s esotericism etc.) will also be discussed.

5TH SEMESTER

Overall aims and objectives:

Students should be able to:

- name the difference between specific and unspecific reactions to pharmaceutical substances
- explain the causality of pharmaceutical substance and effects caused in terms of specific receptor interactions
- carry out the selection of therapeutic methods with regard to clinical applicability
- explain on a molecular basis the interaction of antidotes in poisonings
- define the groups of receptors and give examples of receptor specific drugs.

Reading list:

Aktories, Försterman, Hofmann, Starke; Allgemeine und Spezielle Pharmakologie und Toxikologie: Begründet von W. Forth, D. Henschler, W. Rummel; Verlag: Elsevier, München; 10. Auflage (2009), ISBN-13: 978-3437425226

Lehrbuch der Pharmakologie und Toxikologie für die Veterinärmedizin Verlag: Enke; 2. Auflage (2007), ISBN-13: 978-3830410706

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

in preparation

Learning recommendations:

basic knowledge of the fundamentals of physiology, biochemistry and pathology

Assessment:

a multiple-choice test in general Pharmacology at the end of the fifth semester (20%) as part of the Veterinary Medical Examination in “Pharmacology and Toxicology” after the eighth semester



SPECIFIC TOXICOLOGY

Coordinator:
Petzinger

Instructors:
Petzinger, Geyer, Lämmler, Alber

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

- a lecture on specific natural poisons as well as those of anthropogenic origin, their mode of action, their risk potential and the rates of success in therapy
- bacteria toxins, mildew toxins, plant toxins, animal toxins, fungicides, herbicides, insecticides and other pesticides
- halogen cyclic hydrocarbon substances, environmental toxins, solvents and gases including radon
- heavy metals as well as asbestos
- a discussion of the latest examples of toxins according to current news reports.

Overall aims and objectives:

Students should be able to:

- name causal antidote therapies on the basis of a thorough knowledge of toxin effects
- undertake a rating of toxins with regard to risk potential and exposition
- explain the meaning of acute as well as chronic exposure to toxins with reference to examples
- define symptoms of and identification methods for animal reactions to toxins

Literatureempfehlung:

Marquardt, Schäfer: Lehrbuch der Toxikologie, Verlag: Wissenschaftliche Verlagsgesellschaft, 2. völlig neu bearbeitete Auflage (2004), ISBN-13: 978-3804717770

Frey, Löscher: Lehrbuch der Pharmakologie und Toxikologie für die Veterinärmedizin, Verlag: Enke; 2. Auflage (2007), ISBN-13: 978-3830410706

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

basic knowledge of the fundamentals of physiology, biochemistry and pathology

Assessment:

a multiple-choice test in specific toxicology at the end of the fifth semester (20%) as part of the Veterinary Medical Examination in "Pharmacology and Toxicology" after the eighth semester



PRACTICAL IN PROPAEDEUTICS

Coordinator:

Neiger, Kramer, Lierz, Fey, Wehrend, Doll,
Reiner, Litzke

Instructors:

many

Course type:

practical with animals (4 CHW)

ECTS:

5

Prerequisites:

attendance of the lecture Propaedeutics in
the 4th semester

Introduction:

By working in small groups directly with
the animals, students will apply the funda-
mental theoretical knowledge they ac-
quired during the lectures of the 4th
semester.

Overall aims and objectives:

Students should be able to:

- conduct an entire examination of
a normal patient (cattle, pig, horse,
dog, cat, bird)
- recognize a deviation from the normal
findings
- list the most important normal and
abnormal examination data
- define the nomenclature of clinical
diagnoses

Reading list:

Baumgartner, Walter, Klinische Propädeu-
tik der Haus- und Heimtiere, Verlag: Parey
Bei Mvs; 7. vollständig überarbeitete und
erweiterte Auflage (2009), ISBN-13: 978-
3830441755

Kramer (Hrsg.): Kompendium der Allge-
meinen Veterinärchirurgie, VET-Kolleg, Ver-
lag: Schlütersche; 1. Auflage (2003),
ISBN-13: 978-3877067437

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

Students are advised to revise the theoret-
ical fundamental knowledge before the
tutorial in the fifth semester

Assessment:

a practical examination within the frame-
work of the Veterinary Medical Examina-
tion in “Clinical Propaedeutics” after the
fifth semester (animal species will selected
at random on the day of the examination)



ANIMAL NUTRITION

Coordinator:
Eder

Instructors:
Eder

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:

Feeding of pigs (sows and hogs for breeding, piglets and porkers): standards and requirements; practical feeding aspects; requirements in feed composition; feeding technologies; meaning and use of relevant additives; implications of feeding on product quality; environmentally relevant fae-

ces; animal health; implications caused by feeding errors; specific aspects of the particular performance phases.

Feeding of cattle (lactating cows, dry standing cattle, calves, young heifers, young and breeding bulls, fattening veal, beef heifer): standards and requirements; practical feeding aspects; requirements in feed composition; feeding technologies; meaning and use of relevant additives; implications of feed on product quality; environmentally relevant faeces; animal health; implications caused by feeding errors. Specific aspects of the particular performance phases.

Feeding of sheep and goats (mother goats and sheep, lambs, breeding rams) requirements in particular performance phases, practical advice on feeding, various breeding and fattening methods.

Feeding of horses (cart and sports horses, mares, foals and young horses and stal-



5TH SEMESTER

lions): specific aspects of the horse's digestive system; nutrition demands, requirements in feed rations in the particular performance phases.

Feeding of poultry (hens, chicks and young hens, cocks, broilers, duck, turkey and goose): standards and requirements; practical feeding aspects; requirements in feed composition; feeding technologies; meaning and use of relevant additives; implications of feed on product quality; environmentally relevant faeces; animal health; implications caused by feeding errors; specifications regarding the feeding of poultry.

Overall aims and objectives:

Students should be able to:

- demonstrate knowledge of the nutritional demands of agricultural livestock in particular performance phases
- demonstrate knowledge of the requirements in practical food rations to provide coverage of the nutrient requirements of various livestock concerning different activities
- demonstrate knowledge of the implications of feeding for animal health, the quality of the products and environmentally relevant aspects



ANIMAL HYGIENE

Reading list:

Kirchgessner, M., Roth, F.X., Schwarz, F.J., Stangl, G.I.: Tierernährung; 12. Auflage, DLG-Verlag Frankfurt/Main 2008, ISBN 978-3-7690-0703-9

Kamphues, J., Coenen, M., Iben, Chr., Kienzle, E., Pallauf, J., Simon, O., Wanner, M., Zentek, J.: Supplemente zu Vorlesungen und Tutorialen in der Tierernährung; 11. Auflage, Schaper Verlag Alfeld-Hannover 2009, ISBN 978-3-7944-0223-6

Electronic sources:

PowerPoint presentations will be available

Learning recommendations:

Students are recommended to look at the PowerPoint presentation before the lecture and to acquire further knowledge with the help of the books from the reading list after the lecture

Assessment:

a written exam within the framework of the Veterinary Medical Examination in "Animal Nutrition" after the sixth semester

Coordinator:

Baljer, Bauerfeind

Instructors:

Baljer, Bauerfeind and assistants

Course type:

lecture (2 CHW)

ECTS:

2

Prerequisites:

attendance of the lecture "Animal Husbandry" in the 2nd semester

Introduction:

This lecture will deal with the significance of abiotic environmental influences for the health and performance as well as the well-being of animals. It will provide an overview on the implications of animal husbandry on the environment and on epidemic hygiene measures to ensure the health of humans and animals.

Overall aims and objectives:

Students should be able to:

- explain technopathics
- measure and optimize environmental factors
- list and rate methods and substances for disinfection, sterilization and disinfestation
- create hygiene plans for animal husbandry
- rate risks of waste disposal
- name hygienic risks of animal husbandry

Reading list:

Methlin, Unshelm: Umwelt- und tiergerechte Haltung, Verlag: Parey Bei Mvs; 1. Auflage (2002), ISBN-13: 978-3830440000

Sommer/Greuel/Müller: Hygiene der Rinder- und Schweineproduktion, ISBN-13:978-3825205140

Scripts:

“Tierhygiene”, a script provided by the student body

Self-assessment:

an elaborate questionnaire can be found on the homepage of the department:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/ihyt/Lehre/fragenkataloge

Learning recommendations:

the script, extended with notes of the lecture and excerpts from the books of the reading list

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in “Animal husbandry and animal hygiene” after the sixth semester

VIROLOGY

Coordinator:

Rümenapf, Thiel

Instructors:

Rümenapf, Thiel

Course type:

lecture (2 CHW)

ECTS:

2

Prerequisites:

knowledge of general virology from courses during the 4th semester

Introduction:

The lecture will deal with those virus infections that are relevant for veterinary medicine; in general, the following aspects will be discussed:



- Virus system and taxonomy
- Clinic
- Pathogeneses
- Epidemiology
- Diagnostic
- Treatment

In particular, the diseases of domestic mammals will be discussed.

Overall aims and objectives:

Students should be able to:

- classify viruses and understand their characteristics
- describe diseases that are caused by viruses and correlate these to the respective virus
- explain important aspects of virus infections like pathogenesis, diagnoses and treatment

Reading list:

Michael Rolle/Anton Mayr, Medizinische Mikrobiologie, Infektions- und Seuchenlehre. Enke Verlag Stuttgart, 8. Auflage (2007), ISBN-13: 978-3830410607

Bernd Liess/Oskar-Rüger Kaaden, Virusinfektionen bei Haus- und Nutztieren, Verlag: Schlütersche, Hannover, 2. Auflage, aktualisierte und erweiterte Auflage (2009), ISBN-13: 978-3877067451

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

a script will be provided by the Institute of Virology

Self-assessment:

a questionnaire is available

Learning recommendations:

lecture, script, reading list, virus poster

Assessment:

a written assessment (multiple-choice test) within the framework of the Veterinary Medical Examination in "Virology" after the sixth semester



6TH SEMESTER

Blocks	WEEKS	ECTS
General	1	1
Lymphoreticular system	3	3
Dermatology	3	3
Anaesthesiology	1	1
Locomotor System	6	6
Regular courses	CHW	ECTS
General Pathology S	1	1
Pharmaceutical and Drug Prohibition Law L	1,071	1
Pharmaceutical and Drug Prohibition Law P	0,786	2
Pharmaceutical and Drug Prohibition Law S	0,786	1
Meat Hygiene and Food Science L	2	2
Animal Nutrition P	2	3
Dairy Science L	1	1
Elective Courses		
Examinations		
Pharmaceutical and Drug Prohibition Law		2
Animal Nutrition		2
Animal Husbandry and Hygiene		2
Parasitology		2
Partial Exam MCQ Internal Medicine		
Partial Exam MCQ Surgery and Anaesthesiology		
Partial Exam MCQ Reproductive Medicine		
Practical		
4 week practical		8

L= lecture, P= practical, S=seminar

CHW = contact hour per week (Semesterwochenstunde)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Duration of block courses is given in "h =hours", 1h =45 min

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>

GENERAL

Summary:

In the first organ block, the fundamentals of specific pharmacology and some selected porcine diseases will be presented. In addition, the basic terminology of disinfection will be discussed from a clinical point of view.

Further details (e.g. reading list) regarding individual courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/studium/curriculum>

Courses in detail:

**Clinic for Farm Animals
(Internal Medicine and Surgery)
(Doll, Reiner et al)**

Aujeszky's disease L (1h)

Students should be able to:

- provide a structured overview on the major diseases of the CNS of the pig and compare and rate the individual diseases clinically, therapeutically and economically,
- explain the aetiology and pathogenesis of diseases and list all disease-specific facts
- name the clinical, pathologic-anatomical and histological symptoms and apply these to the development of the disease and the prognosis,
- list possible and important differential diagnosis for the diseases, rate their probability and name diagnostic approaches to their differentiation,
- initiate a disease- and case-related diagnostic plan and discuss possible results,
- demonstrate suitable therapeutic measures for meta- and prophylaxis,

- rate the economic relevance of the diseases.

Porcine Erysipelas L (1h)

Students should be able to:

- discuss the aetiology and pathogenesis of erysipelas and define the specific characteristics of this disease,
- name the clinical, pathologic-anatomical and histological symptoms and apply these to the development of the disease and the prognosis,
- list possible and important differential diagnoses concerning erysipelas and name diagnostic approaches to their differentiation,
- initiate a disease- and case-related diagnostic plan and discuss possible results,
- demonstrate suitable therapeutic measures for meta- and prophylaxis,
- rate the economic relevance of the disease.

European swine fever L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of the European swine fever and define the specific characteristics of this disease,
- name the clinical, pathologic-anatomical and histological symptoms and apply these to the development of the disease and the prognosis,
- list possible and important differential diagnoses concerning European swine fever and name diagnostic approaches to their differentiation,
- initiate a disease- and case-related diagnostic plan and discuss possible results
- demonstrate suitable therapeutic measures for meta- and prophylaxis,
- rate the economic relevance of the disease.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Autonomic nervous system L (5h)

Students should be able to:

- demonstrate a critical understanding of the particular characteristics and effects of the drug groups in question,
- distinguish between different ways of effectiveness,
- distinguish between possible applications with regards to their effect,
- comment on misuse of drugs (doping, addictive potential)
- explain the importance of structure-function-relations for pharmacokinetics and pharmacodynamics
- reflect upon necessary applications of the drug groups in question
- make use of individual drugs during treatment and as an antidote.

Disinfection pharmacology L (1h)

Students should be able to:

- demonstrate knowledge on the history of disinfection, on the class of disinfectants and their structure, on mechanisms of action and on the toxicity of disinfectants and to possible usages

Miscellaneous

Clinical demonstrations S (2h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Disinfection, guidelines to the behaviour in the operating theatre (Comprehensive Course) (4h)

Students should be able to:

- define the term “disinfection” and name examples of clinical application,
- outline the fundamentals of surgical disinfection,
- list and explain the relevance of the most important rules of behaviour in the operating theatre,
- explain the importance of surgical disinfection,
- list the different possibilities of disinfection,
- explain the preparation of a patient for a surgical procedure with the help of an
• example,
- explain the preparation of the surgeon for a surgical procedure with the help of an
• example,
- list and apply necessary steps of hygiene in the field of surgery,
- demonstrate knowledge on the history of disinfection, on the class of disinfectants
• and their structure, on mechanisms of action and on the toxicity of disinfectants and
- on possible usages.

LYMPHORETICULAR SYSTEM

Summary:

The organ block “lymphoreticular system” will provide an overview of its organs such as spleen, bone marrow, blood, etc. and then compare specific diseases (anaemia, clotting disorders) and discuss selected tumours (lymphoma, haemangiosarcoma). In addition, clinical immunology will be discussed in collaboration with the paraclinical institutes.

Further details (e.g. reading list) concerning the courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

Clinic for Reproduction (Wehrend et al.)

Immunology of newborns L (1h)

Students should be able to:

- describe immunological conditions of fetuses and newborns and explain their importance for the development of diseases,
- list, define and explain diagnosis, treatment and prevention of disorders of the immune system in newborns.

Clinic for Small Animals (Internal Medicine and Surgery) (Kramer, Moritz, Neiger et al.)

Anaemia L (1h)

Students should be able to:

- discuss in a problem-oriented way patients with pale mucous membranes,
- recognize the requirement of a blood analysis, perform and interpret a blood smear (semi quantitative evaluation),
- classify the causes of anaemia,
- name the patho-mechanisms that



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cause the different types of anaemia and classify them according to these causes,

- transfer the changes in blood counts given as examples to real cases and thereby interpret them.

Blood clotting of all species L (2h)

Students should be able to:

- define and explain the stages of blood clotting (primary and secondary haemostasis fibrinolysis / coagulation inhibitors),
- define and explain the main tests of blood clotting (platelet number / function tests in particular mucosal bleeding time / APTT, PT, D-Dimer, fibrinogen, anti thrombin),
- interpret clinical findings of coagulopathies / thrombosis,
- interpret the results of the tests mentioned above,
- list the main causes of inherent and acquired disorders in haemostasis (decreased / increased coagulant activity),
- deduce the main therapeutic approaches for patients with clotting disorders.

Blood transfusion L (2h)

Students should be able to:

- adduce a conceptual definition of the term “blood transfusion” and list indications and contraindications to carry out a blood transfusion,
- define the different forms of anaemia in terms of their frequency of occurrence and create an adequate therapy schedule,
- list the different blood transfusion componentets (whole blood, blood components, blood substitutes), name their active substances, and list indications for the choice of each substance,

- define the fundamentals of obtaining a blood sample for the purposes of a blood transfusion and describe the procedure of a blood transfusion itself,
- list the different blood group systems of dogs and cats and discuss various methods for blood typing including their advantages and disadvantages,
- classify transfusion reactions with regard to their causes (immunological, non-immunological), describe the clinical symptoms of a transfusion reaction and list measures that have to be taken in case of intolerance.

Lymphoreticular Surgery L (1h)

Students should be able to:

- list indications for splenectomy,
- name the necessary diagnostic steps that have to be taken in the case of a splenic disease,
- name possible causes of splenic disease,
- describe the basic principles of surgery of the spleen.

FeLV / FIP / FIV L (2h)

Students should be able to:

- explain statistical testing (sensitivity, specificity, predictive values, prevalence),
- discuss the epidemiology and clinics of feline coronavirusis,
- discuss diagnostic tests in suspected cases of FIP,
- explain the pathophysiology of feline retroviruses,
- discuss the epidemiology and clinics of FeLV and FIV
- explain complications of FeLV and FIV infection,
- discuss possible therapeutic measures concerning feline viruses.

Imported infectious diseases L (2h)

Students should be able to:

- inform the owners about possible diseases in foreign countries. In particular, this requires knowledge of endemic areas, showing the owners infectious pathways and strategies in the prevention of imported diseases,
- name drugs for the prevention of diseases transmitted by blood-sucking vectors
- (acaricides, repellents), discuss indications for available blood test and perform and interpret a blood smear (semi quantitative analysis),
- describe the vectors, the pathogens and the clinical symptoms of imported diseases,
- explain the diagnosis and treatment of leishmaniasis, ehrlichiosis, dirofilariosis and hepatozoonosis,
- allocate haematological examples (e.g. hyperglobulinaemia) to various imported infectious diseases

Thrombocytes L (1h)

Students should be able to:

- explain thrombopoiesis,
- explain the causes and the pathophysiology of thrombocytopenia,
- describe the symptoms of immune-mediated thrombocytopenia and recommend treatment methods,
- name the differential diagnosis for a bleeding tendency,
- name the various causes of thrombocytopenia,
- describe platelet function tests.

Oncology – fibrosarcoma, malignant lymphoma of the dog, mast cell tumour L (4h)

Students should be able to:

- explain the tumour biology of soft tissue sarcoma (invasive tumour, pseudo-capsule development),
- explain the fundamentals of “multi-step” oncogenesis (oncogenes, promoters, growth factors, tumour milieu),
- name treatment methods for localized, invasive tumours,
- explain the fundamentals of tumour surgery and compartmental resection techniques,
- explain the tumour biology of a haemopoietic (systemic) tumour,
- explain the clonality of a tumour and the fundamentals of resistance development,
- explain the fundamentals of chemotherapy (no specific protocols),
- discuss effects and side effects,
- discuss the clinical significance of the classification according to “tumour grades”,
- name the importance of tumour staging with regards to its degree, localisation and tumour development including different treatment modalities (surgery, radiotherapy, chemotherapy),
- name the fundamentals of radiotherapy (adjuvant, primary, palliative, curative),
- define multi-modality treatment.

Shock L (3h)

Students should be able to:

- diagnose shock,
- recognize the shock form present and describe its aetiology,
- differentiate between hypovolemia and dehydration,
- perform primary care for the patient,

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- monitor the patient (central venous pressure, blood pressure measurement, ECG, blood gas analysis) and interpret the obtained parameters,
- recognize systemic infective response syndrome (SIRS) and multiple organ dysfunction syndrome (MODS),
- list the clinical symptoms of compensated and de-compensated shock,
- explain the goal of good perfusion,
- explain the treatment of shock.

Haematopoietic system L (1h)

Students should be able to:

- describe indications and the procedure of a bone marrow aspiration,
- describe specification of kinetics in various blood cells,
- classify haematopoietic neoplasm.

Clinic for Horses

(Internal Medicine and Surgery)
(Fey, Litzke et al.)

Special haematology – horses L (1h)

Students should be able to:

- define the main haematological characteristics of the horse,
- evaluate inflammatory induced haematological and biochemical changes
- of the horse.

Anaemia – horses L (1h)

Students should be able to:

- list the main etiological basics of equine anaemia,
- name practical measures and indications of a blood transfusion in horses.

Clinic for Farm Animals

(Internal Medicine and Surgery)
(Doll, Reiner et al.)

Lymphoreticular system Cattle L (1h)

Students should be able to:

- describe the causes and main symptoms of BLAD and enzootic leucosis,
- name possible methods of differential diagnostics, treatment and prevention of the two diseases in question.

PMWS L(1h)

Students should be able to:

- explain the aetiology and pathogenesis of the porcine multi systemic wasting syndrome (PMWS) and point out the particularities of the disease,
- name the clinical as well as the pathologic-anatomical and histological symptoms and to apply these with regard to the development of the disease and the prognosis,
- list potential and important differential diagnoses of PMWS, rate the occurrence and give diagnostic approaches to their classification,
- initiate a disease- and case-related diagnostic plan and discuss possible results,
- define and rate appropriate therapeutic measures as well as measures for meta- and prophylaxis and weigh the suitability of methods,
- rate the economic relevance of the disease.

PDNS L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of porcine dermatitis and nephropathy syndrome (PDNS) and point out the particularities of the disease,

- name the clinical as well as the pathologic-anatomical and histological symptoms and to apply these with regard to the development of the disease and the prognosis,
- list potential and important differential diagnoses of PDNS, rate the occurrence and give diagnostic approaches to their classification,
- initiate a disease- and case-related diagnostic plan and discuss possible results,
- define and rate appropriate therapeutic measures as well as measures for meta- and prophylaxis and weigh the suitability of methods,
- rate the economic relevance of the disease.

Institute of Pharmacology and Toxicology
(Petzinger, Geyer et al.)

Pharmacology blood L (2h)

Students should be able to:

- differentiate the need for blood substitutes including its specific properties
- in several types of shock,
- explain blood clotting physiology including methods of intervention concerning haemostasis therapy,
- define the relevance of fibrin dissolution as well as of fibrin inhibition in blood clot dispersal,
- assess the need for an antidote therapy in disseminated intravascular coagulation (DIC) and excessive fibrinolysis therapy with aprotinin as well as lysine analogues.

Pharmacology of immunosuppressive drugs L (1h)

Students should be able to:

- explain the differences between histamine-induced and interleukin-induced allergy,

- explain the specific targets of the active component of immunosuppressive drugs,
- differentiate between potencies and limits of single immunosuppressants,
- specify indications for single immunosuppressants.

Cytotoxic drugs L (1h)

Students should be able to:

- weigh different therapeutic approaches based on various modes of action of the active pharmaceutical ingredient,
- argue about the usage of the mentioned drugs based on the pathological and patho-physiological conditions of tumour diseases.

Institute of Veterinary Pathology
(Reinacher, Herden, et al.)

Pathology of bone marrow, thymus, spleen, lymph nodes, leukaemia L (2h)

Students should be able to:

- identify the pathological processes and developments in domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical appearance,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological diagnoses and discuss differential diagnoses.

Eine detaillierte Liste der Themen ist in StudIP einsehbar:

<https://studip.uni-giessen.de/studip/>

6TH SEMESTER

Miscellaneous

Clinical demonstrations S (6h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Clinical Pathology

(Comprehensive Course) (4h)

Students should be able to:

- describe and explain the benefits and application of clinical pathological tests when examining healthy and sick animals for diagnosis, prognosis and development monitoring,
- apply the terminology and appropriate units,
- identify pre-analytical, analytical and post-analytical errors,
- describe the morphology and function

of erythrocytes, leucocytes, and platelets,

- identify and discuss the main haematological changes,
- list and explain the most relevant coagulation tests,
- perform, stain and evaluate a blood smear.

Selected immune-mediated diseases

(Comprehensive Course) (6h)

(introduction, antigen presenting cells and MHC-restriction, immune-mediated poly-arthritis, immunoglobulins, B-cells, myasthenia gravis, genetics of the T-cell-receptors and thymic maturation of T-cells, histiocytic diseases, neutrophil granulocytes: Migration and function, acute-phase reaction, sepsis, activation of inflammatory processes: the meaning of macrophages as guarding cells)



Students should be able to:

- define the various defence mechanisms (humoral and cellular defence with inherent and acquired components) and classify their occurrence chronologically depending on the stage of an infection,
- list and explain the humeral and cellular bodily reactions to an infection on a molecular basis,
- understand and interpret inflammatory responses based on immunological changes on the cell level,
- depict exemplarily the structure and defence mechanisms of the intestinal mucosa,
- outline the distribution of cells in the mononuclear phagocytic system of the body and identify cell types depending on their localization,
- define the term of the major histocompatibility complexes, name the different classes, list examples of the cellular distribution of MHC and explain the importance of MHC in defence mechanisms,
- discuss the causes of the heterogeneity of MHCs and explain rejection reactions in the context of transplantation procedures,
- outline the major clinical signs of polyarthritis and discuss these regarding potential differential diagnoses,
- recognise the indications for further analyses (blood count, arthrocentesis, assessment of synovia, infection status) using a specific example and interpret the results of the assessments in a case-related manner,
- distinguish between and discuss infectious and non-infectious causes of poly-arthritis,
- point out and give reasons for necessary treatment measures in the case of an idiopathic immune-mediated arthritis,
- describe the different steps of the leucocyte migration during an infection and explain the underlying molecular mechanisms,
- define the functions of neutrophils, specifically the phagocytic activity of these cells and depict the single steps of phagocytosis,
- discuss the phagocytic properties of neutrophils and their non-specific antimicrobial effector mechanisms,
- classify and explain the disease bovine leucocyte adhesion deficiency (BLAD) regarding its genesis and impacts,
- list and explain the conventional infection reactions and infection-specific blood parameters (blood cells, proteins),
- classify the different haematological markers with regard to their temporal occurrence and their relevance concerning the infective process,
- define the term acute-phase reaction and explain the molecular mechanisms,
- point out acute-phase proteins that are species specific,
- classify and evaluate the role of macrophages in the immunological context of an infection
- derive the molecular processes of macrophage activation and explain the development of characteristic signs of an infection,
- depict the molecular structure of the different immunoglobulin classes and name their functional elements,
- describe the genetic bases of antibody diversity and explain the mechanism and the underlying processes of T-cell-mediated isotype switch,
- describe the maturation and emigration processes of B-lymphocytes and depict the process of differentiation to plasma and memory cells,



- deduce the different ways of antigen neutralization through antibody binding and thereby explain antibody-dependent cytotoxicity,
- describe the conventional symptoms of a generalized myasthenia gravis and explain the underlying pathophysiological mechanism,
- describe the process of MHC-mediated antigen presentation and recognition via T lymphocytes,
- describe differences between MHC class I and MHC class II with regard to antigen presentation,
- describe the genetic basis of versatility of T-cell receptors and the process of maturation and emigration of T-lymphocytes,
- classify the various histiocytic diseases and discuss the respective clinic, the cytological picture and possible treatment methods,
- point out breed and age predispositions that are relevant to particular diseases.

Vaccination horse (Comprehensive Course) (1h)

Students should be able to:

- list the most important diseases that horses are vaccinated against,
- recite the vaccinations that are required by the German Equestrian Association,
- rate the importance of vaccinations concerning their importance in the prophylaxis of equine diseases.

Vaccination small animal (Comprehensive Course) (1h)

Students should be able to:

- conduct a vaccination discussion with a cat or dog owner,
- list core and non-core vaccinations and explain them,
- explain the difference between basic immunisation and booster shots,
- explain the benefits and side-effects of vaccinations.

Lymphoma small animal (Comprehensive Course) (2h)

Students should be able to:

- list the clinical symptoms and possible differential diagnoses for dogs with lymphoma,
- list the different forms of canine lymphoma based on clinical localisation of developments,
- list the differences in the most common localisation of the neoplastic developments of dogs and horses,
- list and explain the most important examinations for establishing the diagnosis,
- list the most important immune-histochemical classifications of lymphoma subtypes,
- list the most important factors that influence the prognosis,
- list possible therapeutic measures for dogs and explain them together with their advantages and disadvantages (median survival rate, side effects, costs),
- explain the differences in therapeutic measures concerning horses in comparison with small animals.

Lymphoma large animal (Comprehensive Course) (1h)

Students should be able to:

- discuss the epidemiology of bovine leucosis,
- discuss the course (including clinic) of bovine leucosis,
- recognise differences in the leucosis of cattle and the lymphoma of cats,
- list prophylactic measures concerning enzootic leucosis.

Blood smears and blood parasites (Comprehensive Course) (5h)

Students should be able to:

- perform a blood smears and stain rapidly by Diff-Quik,
- name the main stains of blood smears to create a differential cell image or a reticulocyte count,
- evaluate blood cells (erythrocytes, platelets, leucocyte populations)
- list the most important haematological characteristics that are specific to dogs, cats, horses, cattle and swine,
- name therapeutic concepts for babesiosis, leishmaniasis and dirofilariasis,
- list possibilities of prophylaxis,
- name the most important blood parasites of the dog and cat and describe their pathways of transmission,
- describe the epidemiological situation (endemic, non-endemic regions),
- recognize blood parasites in blood smears, and fine needle aspirates of bone marrow or lymph nodes.

DERMATOLOGY

Summary:

Dermatological diseases are among the most common reasons for animals being taken to a vet. These also include skin wounds and their treatment. The understanding of the clinical findings (primary and secondary skin lesions) is a prerequisite for the initiation of further diagnostic steps. Pathological findings, in combination with clinical findings, are in some cases necessary to initiate the correct treatment. In pharmacology of dermatological products, important knowledge concerning the medication used will be given.

Further details (e.g. reading list) concerning the courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Dermatological Examination L (1h)

Students should be able to:

- perform a systematic clinical examination including history and dermatological examination,
- differentiate between, classify and assess primary and secondary skin lesions,
- on the basis of the knowledge acquired, discuss differential diagnoses,
- list diagnostic tests available.

Parasitic skin diseases seen from a clinical perspective L (2h)

Students should be able to:

- recognize the most important ectoparasites of dogs and cats and their clinical symptoms,
- demonstrate testing methods that can be used in order to prove certain ectoparasites,
- transfer fundamental knowledge from parasitology concerning life cycles to therapeutic and prophylactic measures.

Dermatological immunology L (1h)

Students should be able to:

- explain various components of the skin immune system and name their functions in defence reactions of the skin,
- list the most important inflammatory cells and mediators,
- explain the four major types of immune reactions,
- explain the basics of lymphocyte participation in allergic skin diseases.

Dermatomycoses – small animals L (2h)

Students should be able to:

- explain the most important dermatophytoses of cats and dogs,
- define and describe clinical lesions associated with dermatophytes,
- interpret and apply appropriate diagnostic tests,
- compile treatment plans,
- list subcutaneous and systemic mycoses,
- describe the clinical signs of a yeast infection, apply and interpret appropriate diagnostic tests.

Autoimmune diseases – small animals L (1h)

Students should be able to:

- list the typical clinical developments of the major autoimmune skin diseases,
- explain diagnostic tests for autoimmune diseases of the skin,
- define the basics of pathogenesis of pemphigus and lupus,
- discuss the treatment of pemphigus and discoid lupus erythematosus (DLE),
- interpret and assess laboratory test findings for monitoring azathioprine and chlorambucil therapy.

Allergies I L (1h)

Students should be able to:

- explain the clinical signs of allergic skin diseases of dogs and cats,
- identify a miliary dermatitis in a cat,
- list and recognize the three forms of eosinophil reactions in cats,
- name three reasons for a symmetrical alopecia of a cat,
- list four examples of allergies and describe clinical developments (atopic dermatitis, flea bite allergies, food intolerance, contact allergy)
- explain the mechanisms of these diseases.

Allergies II L (1h)

Students should be able to:

- list the major and minor criteria for the diagnosis of atopic dermatitis in dogs (Willemsee Criteria),
- list diagnostic methods for the diagnosis of atopic dermatitis and food intolerance to indicate advantages and present disadvantages,
- explain the principle of desensitisation,
- name the indications for a corticosteroid skin allergy therapy,

- list six side effects of corticoid therapy,
- list three further anti-allergic medications, their indications and side effects,
- explain the principle of the treatment of a flea bite allergy and list three adulticides and two insect growth inhibitors.

Bacterial skin diseases L (3h)

Students should be able to:

- explain the different forms of pyoderma (surface, superficial and deep pyoderma),
- define and explain specific types of bacterial pyoderma (folliculitis, imdomestic animaligo, intertrigo, pyotraumatic dermatitis, chin-acne),
- list the most commonly involved bacteria, and explain the significance of opportunistic bacteria,
- discuss the diagnosis (which tests and questions are helpful) and treatment
- of bacterial infections in general (when systemic treatment, when local treatment),
- assess, rate and interpret cytologic samples obtained by different methods (impression smear, FNA, cellotape)
- evaluate the relevance of different treatments (local creams, shampoos, systemic therapy) with regard to their advantages and disadvantages,
- list symptoms of bacterial pyoderma in dogs and cats, as well as several potential primary diseases,
- discuss the diagnosis and significance of multi-resistant and zoonotic bacteria
- (MRSA, MRSP, pseudomonas spp., mycobacteria) and comprehensively explain to the owners.

6TH SEMESTER

Alopecia L (2h)

Students should be able to:

- conduct the clinical examination of a patient with non-inflammatory alopecia,
- assess and interpret trichograms, low-dose dexamethasone stimulation test (LDDST), ACTH stimulation test, thyroxine and TSH concentrations,
- identify differential diagnosis of bilateral symmetrical alopecia,
- list clinical developments of hypothyroidism and hyperadrenocorticism,
- define and explain hypothyroidism and hyperadrenocorticism as well as follicular dysplasia.

Dermatology – small mammals L (1h)

Students should be able to:

- by means of an clinical image, derive and classify possible causes of diseases and determine which disease is more or less common in which animal species,
- convey similarities in diagnosis and therapy that concern more than one species,
- correctly interpret physiologic dermatological features of individual species.

Otitis – Internal Medicine L (1h)

Students should be able to:

- take a good history and perform a general and dermatological investigation of the “ear-patient”, as well as recognize the necessity of diagnosing possible underlying dermatological diseases,
- describe the theoretical otoscopic examination and interpret its findings,
- decide which cases demand further examination, and what kind of examination is most suitable,
- interpret the results of the microscopic examination of the cerumen,
- decide how to treat the various cases.

Surgery of skin wounds I –

Wounds in general L (1h)

Students should be able to:

- list criteria for the assessment of a wound,
- name and discuss different forms of wound healing,
- classify wounds according to the stage of the infection,

Surgery of skin wounds II –

Bite wounds L (1h)

Students should be able to:

- explain the pathophysiology of a bite wound,
- explain main features of a surgical treatment of a bite wound.

Surgical skin wounds III –

Special wounds L (1h)

Students should be able to:

- list the important fundamental rules of hygiene concerning the treatment of skin wounds,
- assess the various wound types,
- distinguish between the various wound dressings.

Otitis – Surgery L (1h)

Students should be able to:

- list and match anatomical structures,
- discuss the principles of surgery concerning the external ear canal and the middle ear,
- list the main diseases of the external ear canal and the middle ear.

Skin cytology L (1h)

Students should be able to:

- name the indications and limitations of a cytological examination,
- explain techniques and performance of a fine needle aspirate depending on site and size of the abnormality,
- list staining procedures for cytological specimens including their advantages and disadvantages,
- list and explain physiological structures in a skin impression smears,
- list and discuss inflammatory cells and types (purulent, granulomatous etc.) and the most important etiological reasons for their occurrence,
- name and interpret recognizable micro organisms in cytological assessments
- classify and interpret recognizable micro organisms of cytological examinations,
- list cytological characteristics of a pemphigus foliaceus,
- list the main criteria for malignancy,

- name cytological characteristics of epithelial, mesenchymal and round cell tumours,
- list examples for benign and malignant epithelial skin tumours,
- recognize and describe the main types of round cells (mast cells, lymphoid blasts, histiocytes and melanocytes).

Clinic for Horses
(Internal Medicine and Surgery)
(Fey, Litzke et al.)

Dermatologic Examination of Horses – Diagnosis of skin diseases in horses, with specific regard to summer eczema L (1h)

Students should be able to:

- rate diagnostic possibilities concerning their invasiveness and indication when proving or ruling out equine skin diseases,
- in particular assess diagnostic possibilities to detect summer eczema.



6TH SEMESTER

Dermatology – horses I L (1h)

Students should be able to:

- recognize the clinical image of important infectious equine skin diseases, and know, which diagnostic steps have to be taken to prove this,
- Give profound particulars on the therapy of the most important infectious equine skin diseases.

Dermatology – horses II L (1h)

Students should be able to:

- recognize, the clinical image of non-infectious equine skin diseases, and know which diagnostic steps are necessary to prove them
- name the most common allergic, autoimmune-related and neoplastic changes of skin or mucosa in the horse
- provide arguments for the therapy of common non-infectious equine skin diseases.

Dermatology – horses III:

Special skin diseases horse L(1h)

Students should be able to:

- assess rare yet impressive symptoms which appear on the skin, with regard to their pathological significance,
- assess neoplastic changes (e.g. melanoma, squamous cell carcinoma, mast cell tumours) and differentiate between different forms of alopecia.

Surgery of equine skin wounds V (2h)

Students should be able to:

- apply the principles of antimicrobial therapy,
- discuss different stitch and wound care techniques,
- perform a practical wound care.

Clinic for Farm Animals (Internal Medicine and Surgery) (Doll, Reiner et al)

Dermatology – ruminants:

General information L (1h)

Students should be able to:

- rate the importance of bovine skin as an industrial natural resource (leather, gelatine),
- recognize the symptoms and causes of technopathics (husbandry or transport related skin alterations),
- describe the causes, characteristics, treatment and prophylaxis of the following diseases:
- depigmentation of hair (copper deficiency)
- hair loss
- photosensitive reactions.

Dermatology – ruminants:

parasites L (1h)

Students should be able to:

- name the clinic, economic impact, diagnosis, differential diagnosis, therapy and prophylaxis of the following parasite-induced skin diseases in ruminants:
- mallophaga and lice infestation
- sarcoptes mange, psoroptes mange and chorioptes mange
- demodicosis
- myiasis

Dermatology – ruminants: viruses / bacteria L(1h)

Students should be able to:

- name the clinic, economic impact, diagnosis, differential diagnosis, the therapy and prophylaxis of the following viral- and bacterial-induced skin alterations in ruminants:
- papillomatosis
- ecthyma contagiosum
- udder-thigh dermatitis

Dermatology – ruminants: actinobacillosis /actinomycosis and trichophytia

Students should be able to:

- name the causes, types and localisation and possibilities of differential diagnosis of actinobacillosis and actinomycosis in cattle and small ruminants,
- provide a prognosis of both diseases and the various treatment methods,
- name the causes, clinical features, differential diagnosis and methods to diagnose trichophytoses,
- describe the zoonotic potential of these diseases,
- describe the prognosis, treatment measures and prophylactic measures, including
- vaccination.

Dermatology – ruminants: tail tip necrosis L (1h)

Students should be able to:

- describe the causes, symptoms and prognosis of tail tip necrosis in cattle,
- describe possible conservative and surgical treatment methods,
- identify measures of prophylaxis for this disease, with special regard to the relevant animal protection law.

FMD L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of foot and mouth disease (FMD) and identify the special features of this disease,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses of FMD, rate their probability and list possible approaches to their classification,
- induce a disease- and case-related diagnostic plan and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta-and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Exudative Epidermitis L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of the disease and point out the special features of this disease,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- induce a disease- and case-related diagnostic and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta-and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Scabies L(1h)

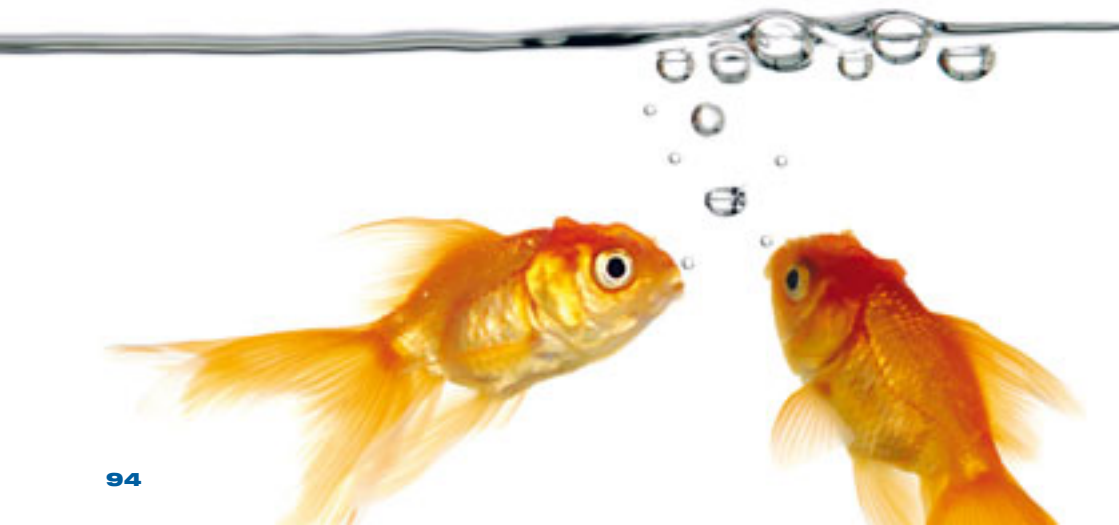
Students should be able to:

- explain the aetiology and pathogenesis of scabies and point out the special features of this disease,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses of scabies, rate their probability and list possible approaches to their classification,
- induce a disease- and case-related diagnostic and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta-and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Dermatology – miscellaneous L(1h)

Students should be able to:

- explain the aetiology and pathogenesis of important dermatological diseases in pigs and point out the special features of these diseases,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses of dermatoses, rate their probability and list possible approaches to their classification,
- induce a disease- and case-related diagnostic and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta-and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.



Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Antifungals L (1h)

Students should be able to:

- derive the possible uses of the drugs,
- define the areas of application,
- explain risks of application,
- explain the specifications of the drugs,
- apply the fundamentals of pharmacokinetics.

Dermatological drugs L(1h)

Students should be able to:

- discuss skin as a receptive organ for drugs, as well as an organ to be treated medically,
- name specific requirements of medicines that are relevant to local application,
- name aids and appliances for penetration and wound healing.

Institute of Veterinary Pathology (Reinacher, Herden, et al.)

Pathology skin L (5h)

Students should be able to:

- identify the pathological processes and developments in domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical appearance,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological diagnoses and discuss differential diagnoses.

A detailed list of the topics is available online at:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (6h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Cytology (Comprehensive Course) (3h)

Students should be able to:

- name the indications and limits of cytological examinations,
- explain the preparation and staining of cytological specimens,
- list and discuss inflammatory cell types and types of infection (purulent, granulomatous etc.) and the most important etiological causes for their occurrence,
- name cytological characteristics of epithelial, mesenchymal tumours and round cell tumours,
- recognize and describe the cytological characteristics of important skin tumours in dogs (lipoma, mast cell, dermal connection cyst),
- identify and describe the cytological characteristics of pemphigus foliaceus in dogs,
- recognize and describe the most important round cell types (mast cells, lymphoid blasts, histiocytes and melanocytes).

Skin Quiz (Comprehensive Course) (1h)

Students should be able to:

- relate clinical images to possible diagnostic tests and differential diagnoses,
- identify ectoparasites in dogs.

ANAESTHESIOLOGY

Summary:

Operations on animals can only be performed under sufficient anaesthesia. Pharmacology conveys an understanding of the application of anaesthetics, hypnotics, sedatives and analgesia. To ensure that anaesthesia can take place without complications, the various types and techniques of anaesthesia and monitoring will be illustrated. For dogs, cats, horses and cattle species-specific differences of anaesthesia will be discussed.

Further details (e.g. reading list) concerning the courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Anaesthesia – small animals: basics of Anaesthesia L (1h)

Students should be able to:

- explain the terms sedation, hypnosis, narcosis, analgesia and anaesthesia,
- define the stages of anaesthesia, perform a pre-anaesthetic examination and carry out an ASA classification.

Anaesthesia – small animals: local anaesthesia L (1h)

Students should be able to:

- explain the term local anaesthesia,
- choose the suitable medication and dosages and know how to combine local anaesthetics with opioids or alpha 2 agonists,

- choose the appropriate local anaesthesia for particular surgical procedures,
- explain the differences of surface and infiltration anaesthesia and peripheral and central nerve blockage,
- explain the effects and side effects of local anaesthetics and analgesics.

Anaesthesia – small animals: inhalation anaesthesia L (1h)

Students should be able to:

- explain advantages and disadvantages of inhalation anaesthesia,
- describe the concept of MAC and know the legal pharmaceutical prerequisites of the use of volatile anaesthetics,
- describe the protection of the respiratory passages,
- describe the various anaesthetic systems and their advantages and disadvantages.

Anaesthesia – small animals: ventilation, monitoring L (1h)

Students should be able to:

- explain the indications, advantages and disadvantages of ventilation,
- explain the different forms of ventilation (IPPV, PEEP, CPAP, SIMV),
- explain the different forms of monitoring (pulse palpation, auscultation, capnography, electrocardiography, blood pressure, pulse oximetry, pulse plethysmography, blood gas analysis),
- describe the various forms of invasive and non-invasive monitoring,
- interpret the readings that were obtained,
- interpret a capnogram.

Anaesthesia – dog L (1h)

Students should be able to:

- choose the anaesthesia, anaesthetics and monitoring that is suitable for the patient in question with regard to different symptoms in dogs,
- calculate the required dosage and interpret the course of the anaesthesia.

Anaesthesia – cat L (1h)

Students should be able to:

- choose the anaesthesia, anaesthetics and monitoring that is suitable for the patient in question with regard to different symptoms in cats,
- calculate the required dosage and interpret the course of the anaesthesia.

Anaesthesia – risk patient L (1h)

- choose suitable forms of anaesthesia and anaesthetics for patients at risk,
- calculate the required dosage and choose the necessary monitoring of the patient.

Clinic for Horses

(Internal Medicine and Surgery)

(Fey, Litzke et al.)

Anaesthesia – horses L (2h)

Students should be able to:

- discuss the process of equine anaesthesia,
- list and discuss anaesthetic drugs,
- perform a pre-anaesthetic examination of the horse,
- discuss advantages and disadvantages of injection and inhalation anaesthesia.

Clinic for Farm Animals

(Internal Medicine and Surgery)

(Doll, Reiner et al.)

Anaesthesia – cattle L (1h)

Students should be able to:

- name the various procedures of local anaesthesia such as surface, conduction, infiltration and intravenous congection anaesthesia as well as the general anaesthetic of ruminants and the indications,
- describe appropriate methods of anaesthesia for the following surgical procedures:
- surgery of the head; dehorning, evisceration of the orbit, tongue operations
- surgery in the field of distal limbs
- laparotomy
- navel operations
- tail amputation

Institute of Pharmacology and

Toxicology (Petzinger, Geyer et al.)

Local anaesthetics L (1h)

Students should be able to:

- elucidate the particular structures of pain fibres for the selective effect of local anaesthetics in sensible as compared to motoric nerve fibres,
- explain the importance of the voltage dependent sodium channel for therapy and toxicology,
- undertake a clinical and conceptual distinction of peripheral pain elimination, central analgesia in spinal marrow and loss of consciousness seizure (hypnosis, narcosis) via different substance classes,
- recognize the therapeutic relevance of pharmacokinetics, metabolism and lipophilicity in local anaesthetics,

6TH SEMESTER

Opiates, analgesics, alpha2-agonists L (2h)

Students should be able to:

- derive and define the fields of application of the substances,
- define the fields of application of small and opiate analgesics,
- evaluate and justify the risks of the application,
- name the major differences of the substance classes,
- apply the fundamentals of pharmacokinetics.

Narcotics: inhalation and injection L (1h)

Students should be able to:

- demonstrate a critical understanding of the effects and side effects of injection and inhalation narcotics,
- recognize differences in effect,
- elaborate possibilities of application based on the effect,
- critically assess hazards of non-critical handling,
- learn about the importance of pharmacokinetics,
- reflect on the necessary and possible application,
- evaluate co-medication and antagonisms.

Sedatives, major tranquilizers L (1h)

Students should be able to:

- elaborate on the various applications of major tranquilizers and reflect upon their usage critically,
- assess their potential of unwanted drug effects,
- rate the importance of neuroleptanalgesia for veterinary medicine.

Hypnotics, euthanasia, anti-epileptic drugs L (1h)

Students should be able to:



- demonstrate a critical understanding of the particular properties of the effect of barbiturates
- describe the different effects of barbiturates and benzodiazepines,
- explain hypnosis and anaesthesia,
- evaluate the possibilities of application on the basis of effect,
- critically assess their misuse and the dangers of non-critical application,
- estimate the importance of pharmacokinetics,
- reflect upon necessary and possible applications.

Ataractics, minor tranquilizers L (1h)

Students should be able to:

- demonstrate a critical understanding of the particular properties of the effect of minor tranquilizers,
- explain the meaning of the term ataraxia,
- describe the different effects of ataraxia and sedation,



- explain hypnosis and anaesthesia,
- evaluate the possibilities of application on the basis of effect,
- criticize misuse and abuse (addiction potential),
- assess the importance of pharmacokinetics (half life period) for mental addiction and correlation with opiates (flash as a basis of heroin addiction),
- reflect upon the necessary application of benzodiazepines,
- explain the dose relation of the application as an antidote for central cramps.

Miscellaneous

Clinical demonstrations S (2h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

LOCOMOTOR SYSTEM

Summary:

Diseases of the musculoskeletal system are among the most common reasons for examinations of small animals and horses. At the beginning of the block anatomical and physiological basics are rehearsed and deepened. The general and specific clinical examination of the locomotor system are prerequisites for an appropriate therapy. They are the basis for further diagnostic steps such as imaging procedures and laboratory examinations. Obtaining a thorough knowledge of common diseases of the musculoskeletal system in domestic animal species, but also their diagnostics and therapy are the focus in this course.

Further details regarding courses (e.g. reading list) can be found online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Orthopaedic examination of small animals L (1h)

Students should be able to:

- perform a clinical orthopaedic examination,
- relate certain orthopaedic diseases to appropriate methods of investigation,
- deduce the significance of lameness.

6TH SEMESTER

X-ray fundamentals L (1h)

Students should be able to:

- define standard examinations,
- define normal findings.

Further diagnostics locomotor system – small animals L (1h)

Students should be able to:

- assess and evaluate possible diagnostic methods,
- define and explain diagnostic possibilities.

Sectional imaging basics L (1h)

Students should be able to:

- describe the basics of CT and MRI and name common areas of application.

X-ray – small animal L (1h)

Students should be able to:

- recognize and define different types of fractures in radiographs,
- name the different levels of fracture healing.

MRI / CT scintigraphy L (1h)

Students should be able to:

- define the general physical fundamentals of CT, MRI and scintigraphy,
- deduce and list indications for the individual methods.

Tendons, muscles – small animal L (1h)

Students should be able to:

- explain special features in the anatomy and function of tendons and muscles,
- define the terms “contraction”, “tendinosis”, “tenosynovitis”,
- name the basic principles of specific disorders of muscles and tendons (biceps brachii, Achilles tendon, tendonitis, tenosynovitis)
- explain the basic principles of surgical care.

Fractures L (1h)

Students should be able to:

- describe and classify fractures,
- deduce the principles of primary and secondary bone healing,
- assess the boundaries and possibilities of conservative fracture treatment,
- name implants and list indications for their application,
- define and explain the terms “biological” and “stable” osteosynthesis.

Arthritis / degenerative joint disease (DJD) L (1h)

Students should be able to:

- define rheumatoid and non-rheumatoid arthritis,
- list the types of arthritis and name possibilities for their differentiation,
- define the terms “DJD”, “arthritis”
- explain the significance of arthritis of the different joints with regard to the symptoms,
- list and assess different therapeutic options.

Knee – small animal L (1h)

Students should be able to:

- depict the aetiology of the cruciate ligament rupture and name various therapeutic methods,
- describe the nature and scale of patella luxation and list possible surgical forms of therapy.

Bandage theory L (1h)

Students should be able to:

- define, describe and perform various bandage techniques and types in the different species.

Pain therapy L (2h)

Students should be able to:

- assess and define pain in dogs, cats and other pets,
- perform an analgesia that is adapted to the patient.

Ligament injuries carpus / tarsus in small animals L (1h)

Students should be able to:

- differentiate between several injuries in the area of the carpal and tarsal joint and name possible therapeutic measures,
- name the most common ligament injuries.

HD & ED – small animals L (1h)

Students should be able to:

- name the different degrees of dysplasia of the hip joint and explain on the basis of radiographs,
- name different degrees of elbow dysplasia and explain upon the basis of radiographic images.

Small mammals I + II

Locomotor system L (2h)

Students should be able to:

- name the principles of the locomotor system examination in small mammals,
- list the most common diseases of the locomotor system in small mammals and explain individual forms in further detail,
- name methods of further diagnostics in small mammals,
- list possible forms of therapy for the individual diseases mentioned.

Metabolic bone diseases L (1h)

Students should be able to:

- deduce the etiology of the major metabolic diseases and name the therapeutic measures required,
- define the terms of the most important metabolic bone diseases,
- match diseases to their respective radiographs.

Physiotherapy L (4h)

Students should be able to:

- define and explain the term “physiotherapy”,
- state its main applications in orthopaedics and neurology,
- create a treatment programme involving physiotherapy,
- perform a physiotherapeutic examination,
- list indications for physiotherapy.

Fracture treatment – small animals L (2h)

Students should be able to:

- differentiate between those forms of fracture that are classified as “difficult” and those that are considered “simple”,
- match individual types of fractures to the possible forms of osteosynthesis.

Paw – small animals L (1h)

Students should be able to:

- enumerate the most common inflammatory and neoplastic diseases of the paw,
- name the special characteristics of fracture treatment, as well as the treatment of dislocations.

Joint diseases – small animal L (1h)

Students should be able to:

- describe and evaluate the different forms of dislocations,
- list possible therapeutic measures,

6TH SEMESTER

- list the most important disorders of the hip joint and demonstrate therapeutic measures.

Neurology – small animal: epilepsy L (1h)

Students should be able to:

- list possible differential diagnoses for epileptic seizures,
- explain the necessary diagnostic measures.

Neurology – small animal: malformations of the brain L (1h)

Students should be able to:

- list the clinically relevant malformations of the brain,
- diagnose the clinically relevant malformations of the brain using MRI,
- suggest a treatment for the clinically relevant malformations of the brain.

Neurology – small animal: inflammatory brain disorders L (2h)

Students should be able to:

- list breed predispositions of the most important inflammatory conditions,
- list the relevant medication,
- explain effects and side effects of these drugs.

Neurology – small animal: spinal fractures L (1h)

Students should be able to:

- explain the basic principles including the advantages and disadvantages of neurosurgical decompression techniques,
- describe instruments, implants and techniques used for spinal fracture repair.

Neurology – small animal: intervertebral discs disease L (1h)

Students should be able to:

- explain the various diseases that are caused by disc degeneration.

Neurology – small animal: Wobbler L (2h)

Students should be able to:

- list the different causes of the Wobbler syndrome.

Neurology – small animal: brain tumours L (1h)

Students should be able to:

- name the different forms of brain tumours,
- assess the biological behaviour of brain tumours,
- rate the treatability of brain tumours.

Neurology – small animal: gait analysis L (1h)

Students should be able to:

- localize neurological disorders based upon an analysis of gait and neurological abnormalities,
- recognize the different clinical appearances of epileptic changes,
- differentiate between the characteristics of orthopaedic and neurological diseases.

Ophthalmology – small animal: eyelid, conjunctiva, cornea L (3h)

Students should be able to:

- list and define diseases of the eyelids, the conjunctiva and nictitating membrane as well as those of the cornea,
- list characteristic findings of the specific diseases and suggest the appropriate therapeutic measures,
- define the basic principles of diseases of the eyelid and adnexa,
- name the diagnostic agent of choice as well as the appropriate therapy regarding diseases of the eyelid.

Ophthalmology – small animal: tumours, KCS L (1h)

Students should be able to:

- explain the most important differential diagnoses for retrobulbar tumours,
- describe the ophthalmic examination in case of a suspected dry eye / keratoconjunctivitis sicca (KCS) (= Schirmer's tear test),
- name the therapeutic measures of choice in the case of a dezemetozele,
- demonstrate breed predispositions for superficial keratitis chronica (= Shepherd dog) and therapeutic measures.

Ophthalmology – small animal: methods L (1h)

Students should be able to:

- illustrate methods for further examinations of the eyes,
- name the indications that lead to further examinations of the eyes.

Ophthalmology – small animal: corneal diseases L (1h)

Students should be able to:

- name the basics of the most important diseases of the cornea,
- indicate the diagnostic measures and the respective therapy to be used for corneal diseases.

Ophthalmology – small animal: lens, anterior chamber, retina L (1h)

Students should be able to:

- name the basics of diseases of the lens, anterior chamber and cornea,
- indicate the diagnostic measures and the respective therapy to be used for diseases of the lens, anterior chamber and cornea.

Clinic for Horses (Internal Medicine and Surgery) (Fey, Litzke et al.)

Equine orthopaedic examination L (1h)

Students should be able to:

- practically implement theoretically acquired knowledge of orthopaedic examinations,
- perform an orthopaedic examination,
- match different examination methods to specific orthopaedic diseases,
- define the degree of lameness.

Fractures of joints L (1h)

Students should be able to:

- define, classify and explain joint fractures,
- assess and diagnose joint fractures,
- discuss the treatment and prognosis concerning joint fractures.

Specific fractures in large animals L (1h)

Students should be able to:

- discuss the treatment and prognosis of specific fractures in the horse.

Tendons, muscles, ligaments – horses L (2h)

Students should be able to:

- apply anatomical knowledge of tendons, muscles, ligaments,
- define, assess and evaluate afflictions concerning tendons, muscles, ligaments,
- discuss therapeutic measures.

X-ray – horses L (1h)

Students should be able to:

- take radiographs based on acquired knowledge,
- assess radiographs,
- name technical requirements for radiographic diagnostics,
- describe this examination technique for the diagnosis of lameness.

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Ultrasound – horses L (1h)

Students should be able to:

- define the indication for sonographic examinations of the muscular-skeletal and locomotor systems of horses and small animals,
- deduce the sono-anatomical findings.

OCD – small animals and horses (1h)

Students should be able to:

- define, classify and explain osteochondrosis dissecans (OCD),
- assess and diagnose OCD,
- discuss the therapy and prognosis of OCD.

Ligament injury – horses L (1h)

Students should be able to:

- apply anatomical knowledge of ligaments,
- define, classify and explain ligament injuries,
- assess and diagnose ligament injuries,
- discuss the therapy and prognosis of ligament injuries.

Equine front and hind limb joints L (3h)

Students should be able to:

- apply their anatomical knowledge of joints,
- define, classify and explain different joint disorders,
- diagnose and rate joint disorders,
- discuss the therapy and prognosis of joint disorders.

Diseases of the hoof L (3h)

Students should be able to:

- apply their anatomical knowledge of the hoof,
- define and explain these diseases,
- diagnose diseases of the hoof,
- discuss possible therapeutic measures for diseases of the hoof.



Equine Neurology L (2h)

Students should be able to:

- assign most common deficits to lesions in the spinal cord or brain,
- name the most important and intrinsically relevant diseases of the CNS of the horse,
- comment on pathogenetic backgrounds and give a prognostic assessment.

Equine Ophthalmology L (1h)

Students should be able to:

- apply anatomical knowledge of the eye,
- assess and classify eye diseases,
- define and explain ophthalmologic terminology.
- discuss different treatment modalities of ophthalmic diseases.

**Clinic for Farm Animals
(Internal Medicine and Surgery)
(Doll, Reiner et al.)**

Orthopaedic examination of cattle L (1h)

Students should be able to:

- recognize lameness based on typical symptoms,
- undertake an assessment and examination of the claw,
- palpatorically assess joints and synovial tendon sheaths,
- describe the findings of normal and abnormal synovial fluid.

Tendons, muscles – ruminants L (1h)

Students should be able to:

- name the causes, clinical symptoms, further diagnostic methods, therapy and prophylaxis of the following disorders of tendons and muscles in cattle and small ruminants:
- Neuromyodysplasia congenita
- Spastic paresis
- Spinal muscle atrophy

- Spinal dysmyelogenesis
- Weaver Syndrome
- Myodystrophy caused by vitamine E and selenium deficiency

Hoof infection – ruminants L (1h)

Students should be able to:

- discuss the meaning of claw/hoof diseases, as well as recognize the following claw/hoof diseases, describe their causes and name possible measures for their therapy and prophylaxis:
- Laminitis
- Dermatitis digitalis, Dermatitis interdigitalis
- Interdigital phlegmon
- Whiteline disease
- Limax
- Rusterholz ulcer

Neurology / ophthalmology – ruminants L (1h)

Students should be able to:

- diagnose the following diseases of the CNS and sensory organ and discuss their respective therapy and prophylaxis based on the clinical finding:
- BEF
- Rabies
- Visna
- CAE
- BSE
- Scrapie
- Infectious bovine keratoconjunctivitis
- Cancer eye
- Otitis media

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Porcine claws and joints L (1h)

Students should be able to:

- provide a structured overview of the major diseases of the locomotor system of pigs and evaluate the individual diseases clinically, therapeutically and economically,
- explain the aetiology and pathogenesis of these diseases and point out their characteristic features,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for these diseases, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of these methods,
- rate the economic relevance of the diseases.

Glasser's Disease L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of Glasser's disease and identify the special features of this disease,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses of Glasser's disease, rate their probability and list possible approaches to their classification,
- induce a disease- and case-related diagnostic and discuss possible results,

- weigh appropriate therapeutic measures and measures for meta- and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Porcine muscles L (1h)

Students should be able to:

- provide a structured overview of the most important myopathies of pigs,
- and evaluate individual diseases clinically, therapeutically and economically,
- explain the aetiology and pathogenesis of these diseases and identify their special features,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses for the diseases, rate their probability and list possible approaches to their classification,
- initiate diagnostics for this specific disease and case and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta- and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Porcine CNS L (1h)

Students should be able to:

- provide a structured overview of the most important diseases of the CNS of pigs and evaluate individual diseases clinically, therapeutically and economically,
- explain the aetiology and pathogenesis of these diseases and identify their special features,
- name the clinical and pathological, anatomical and histological symptoms and apply these with regard to the development and the prognosis of the disease,
- list possible and important differential diagnoses for the diseases, rate their probability and list possible approaches to their classification,
- initiate diagnostics for this specific disease and case and discuss possible results,
- weigh appropriate therapeutic measures and measures for meta- and prophylaxis and the suitability of the methods,
- rate the economic relevance of the diseases.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

NSAID L (1h)

Students should be able to:

- derive and define the usefulness of these substances,
- evaluate and justify the risks of the application,
- name the major differences of the substance classes,
- apply the fundamentals of pharmacokinetics.

Central and peripheral muscle relaxants L (1h)

Students should be able to:

- derive and define the usefulness of the substances,
- explain the risks and adverse effects,
- justify countermeasures,
- explain interferences of pharmaceuticals.

Glucocorticoids L (1h)

Students should be able to:

- classify the substances pharmacologically and outline their usefulness,
- define the fields of application and the benefits of glucocorticoids,
- assess the potential risks in the case of an overdose,
- explain the so-called non-steroidal effects of steroid hormones,
- evaluate alternatives to a glucocorticoid therapy.

Institute of Veterinary Pathology (Reinacher, Herden, et al.)

Pathology muscular skeletal and locomotor system and CNS / PNS L (3h/5h)

Students should be able to:

- identify the pathological processes and developments in domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical appearance,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological diagnoses and discuss differential diagnoses.

A detailed list of the topics is available online at:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (12h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Refresher course in Physiology

Locomotor system

(Comprehensive Course) (1h)

Students should be able to:

- define the physiological basics of muscle and tendon functions,
- explain contractures and clinical appearance.

Refresher course in Anatomy

(Comprehensive Course) (2h)

Students should be able to:

- combine the anatomy of the knee with the surgical treatment of a cruciate ligament rupture,
- combine the anatomy of hip dysplasia (HD) with surgical therapeutic possibilities.

Further diagnostics large animal

Locomotor system

(Comprehensive Course) (2h)

Students should be able to:

- Explain how to use peripheral nerve blockages for diagnosing lameness in large animals,
- discuss the indications of the nerve blockage for particular forms of lameness,
- discuss imaging procedures to diagnose lameness.

Fractures (Comprehensive Course) (3h)

Students should be able to:

- define, classify and explain fractures,
- diagnose and assess fractures,
- discuss the treatment and prognosis of fractures.

Bandaging techniques small animals,

ruminants, horses (Comprehensive

Course) (3h)

Students should be able to:

- define, describe and perform specific bandaging techniques and
- types concerning different species.

Refresher course in physiology and

anatomy of the nervous system

(Comprehensive Course) (3h)

Students should be able to:

- explain the correlation between anatomy, physiology and clinical neurology,
- identify gait abnormalities and classify them according to neurophysiological systems,
- explain anatomical basics and the fundamentals of neuroanatomy,
- classify gait abnormalities.

Refresher course in anatomy and

physiology of the eye

(Comprehensive Course) (2h)

Students should be able to:

- recognize the diseases discussed in the lecture and assign the appropriate therapy (glaucoma),
- name the location and significance of the chamber angle,
- point out the importance and function of the ciliary body,
- name the structures of the secretory tear apparatus.

GENERAL PATHOLOGY

Coordinator:
Reinacher

Instructors:
Reinacher, Herden, Köhler, Henrich,
Huisinga, Schmiedeknecht

Course type:
seminar (1 CHW)

ECTS:
1

Introduction:
Students will acquire knowledge of important aspects of essential topics in general pathology.

Overall aims and objectives:

Students should be able to:

- explain and recognize the diseases discussed, their aetiologies and pathogeneses.

Reading list:

Dahme Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke, 6 completely revised edition (2007), ISBN-13: 978-3830410485

Mc Gavin, Pathologic Basis of Veterinary Disease, Publisher: Mosby, 4th edition (2006), ISBN-13: 978-0323028707

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

preparation of relevant topics prior to the seminar

Assessment:

a written exam (MCQ) at the end of the sixth semester, an oral and a practical examination within the framework of the Veterinary Medical examination in “General and specific Pathology, pathological anatomy and histology” after the eleventh semester



PHARMACEUTICAL AND DRUG PROHIBITION LAW

Coordinator:
Ziegler

Instructors:
Ziegler

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

- the right to dispense pharmaceutical drugs by the veterinarian; the requirements for running a pharmacy: the tierärztliche Hausapothekenverordnung (TÄHAV)
- the German drug law: what are medicinal products (mp)? Definitions, real/fictional drugs, authorisation of mp, registration of homeopathic drugs
- the application/dispensation of mp: marketability of mp, how to dispense drugs only available on prescription (so called "rezeptieren")
- critical mp, deception, report of unexpected adverse drug reactions, "Stufenplanverfahren", pharmacovigilance
- shortage of mp, shortage of therapy and redeployment of pharmacy-only mp
- the use of mp for animals that are used for food production: EU Regulation 470/2009: Rückstandshöchstmengen-VO, latency period
- the effects of EU-regulations on the veterinary practice ("Rosa Liste"), medicated foodstuff, documentation for veterinary drugs
- the use of mp on horses, the equine pass, the "positive list"
- legal regulations that are relevant for

- the veterinarian when using narcotics
- (Betäubungsmittelgesetz (German Narcotics Act)), the regulations concerning the prescription of narcotics
- BTM-Binnenhandelsverordnung (the narcotic internal trade regulation), BTM-Außenhandelsverordnung (the narcotic foreign trade regulation)
- hazardous substances in the veterinary pharmacy/practice
- the requirements for the production of mp in the veterinary pharmacy: knowledge in labelling (package insert, expert information), pricing, storage, disposal of medicines
- the requirements for the production of medicines in the veterinary pharmacy: knowledge in galenics
- the use of medical devices in the veterinary practice

Overall aims and objectives:

Students should be able to:

- assess mp with regard to current laws and regulations, discuss the possibilities of authorisation or registration,
- define certain terms (e.g., mp, medicated foodstuff, pre-mixtures of medicine, rededication, shortage of therapy, etc.),
- explain the channels of distribution for mp/narcotics,
- classify mp regarding their marketability,
- enumerate and explain the requirements for the registration and running of a veterinary pharmacy (TÄHA) according to the tierärztliche Hausapothekenverordnung,
- name and assess the requirements for the purchase, storage, release, and application of veterinary mp (including narcotics) in accordance with current laws and regulations,
- rate and evaluate the different legal situations when treating food-producing animals and pets with mp,

- list documentation of the purchase, dispensation, application and, where applicable, the appropriate disposal of mp and narcotics, respectively
- explain the necessary measures that have to be taken in order to report unexpected adverse drug reactions to the appropriate authority,
- explain the obligation to inform (such as indication on waiting periods) to animal holders
- name the requirements for the production of mp in the veterinary pharmacy (TÄHA)
- choose appropriate mp for their respective disease patterns and prescribe according to the current laws and regulations
- recognize substances as hazardous and handle these according to current laws and regulations,
- recognize medical products and handle these according to current laws and regulations.

Reading list:

Zrenner, Paintner, Bert: Arzneimittelrechtliche Vorschriften für Tierärzte und einschlägige Vorschriften anderer Rechts-

reiche, Deutscher Apotheker Verlag, ISBN-13: 9783769243192

Electronic sources:

Veterinary information service on the use of medicinal products, toxicology and pharmaceutical regulations: www.vetidata.de

Scripts:

a PowerPoint presentation of the lecture is available for download on the homepage of the department:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/pharmatox/lehre

Learning recommendations:

Students are advised to prepare the content of the lecture (using the power point presentation) and the updates of the laws and regulations and gain further knowledge independently:

www.vetidata.de und Zrenner/Paintner

Assessment:

an oral examination the within the framework of the Veterinary Medical examination (80%) in “Pharmaceutical and Drug Prohibition Law” after the sixth semester



PHARMACEUTICAL AND DRUG PROHIBITION LAW

FABRICATION OF MEDICINAL PRODUCTS AND PRESCRIPTION

Coordinator:

Ziegler: Fabrication of medicinal products

Lämmler: Prescription

Instructors:

Ziegler: Fabrication of medicinal products

Lämmler: Prescription

Course type:

practical (~ 2 CHW)

ECTS:

3

Prerequisites:

Students must have attended the lecture in Pharmaceutical and Drug Prohibition Law

Introduction:

- a discussion of the legal requirements for the preparation of mp
- the packaging, labelling, pricing, examination, and disposal of mp
- an introduction to common methods of drug production (e.g., weighing methods, grinding in mortars, dissolving, filtration, sterilisation)
- a safety briefing according to the Hazardous Substances Ordinance (Gefahrstoffverordnung GefStoffV),
- the preparation of sterile solutions
- the preparation of powders, aliquoted powders, powders in capsules
- the preparation of suspensions, suspension ointments
- the preparation of solution ointments, creams and gels
- an examination: the preparation of 2 mp according to the prescription, labelling, production control, pricing calculation regarding regulations, questions on galenics
- formal criteria for the prescription of mp intended for use in small mam-



- mals, domestic animals and food-producing animals
- the prescription of narcotics
- the prescription of medicated food-stuff
- documentation according to the veterinary pharmacy regulation (e.g. § 13 obligation of verification) and the German pharmaceutical regulations
- documentation according to the German Narcotics Act

Overall aims and objectives:

Students should be able to:

- apply pharmaceutical methods (e.g. scaling, grinding in mortars, sterilisation),
- produce and pack specific drugs (e.g. liquid dosage forms, solid drugs, dermatological creams),
- label mp according to legal regulations,
- calculate drug prices according to legal regulations,
- examine mp according to legal regulations,

- dispose of mp according to legal regulations,
- choose mp for the corresponding species and clinical symptoms, and prescribe according to legal regulations,
- provide evidence for the purchase, evaluation, delivery and application of mp and narcotics

Reading list:

Schöffling, Ursula; Arzneiformenlehre. Ein Lehrbuch der Galenik, Verlag: Deutscher Apotheker Verlag 2009, 5. neubearbeitete und erweiterte Auflage, ISBN-13: 9783769240931

Wurm, Gisela; Galenische Übungen für das technologische Praktikum und die pharmazeutische Praxis, Verlag: Govi-Verlag, 17. neubearbeitete Auflage (2001), ISBN-13: 978-3774109049

Scripts:

3 Scripts will be available for download on the homepage of the institute:

1. Practical manual to the preparation of medicinal products
2. Information on substances and medicinal products used in the course
3. Information on prescriptions

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/pharmatox/lehre

Learning recommendations:

Students are advised to prepare the content of the tutorials and revise with the help of the scripts.

Assessment:

an oral examination the within the framework of the Veterinary Medical examination (20%) in "Pharmaceutical and Drug Prohibition Law" after the sixth semester

MEAT AND FOOD HYGIENE

Coordinator:

Bülte, Eisgruber

Instructors:

Bülte, Eisgruber, Zens

Course type:

lecture (2 CHW)

ECTS:

2

Prerequisites:

none

Introduction:

The course serves

- as an introduction to the topic of meat and food hygiene
- as a continuation of the curriculum of "Bacteriology, Mycology and Virology"
- as a preparation for the practical "Ante mortem and post mortem inspection" and "Food safety evaluation and technology"

Overall aims and objectives:

Students should be able to:

- explain the principles of food safety (risk analysis and HACCP concept),
- explain the hygiene and technology of meat production (Schlachtlinien),
- give an overview on the horizontal and vertical meat and food hygiene law (EU-regulation and national laws and regulation types),
- explain the fundamentals of official food control (structure and functions of the official veterinarian),
- explain the fundamentals of food microbiology (influence on survival and neutralisation of microorganisms),
- give an overview of the damage to

health caused by foodstuff (dangers, including substances that form residues and contaminants),

- explain the fundamentals of food spoilage (of a microbial as well as non-bacterial nature),
- explain the possibilities of the preservation of foodstuff of animal origin (production and storage)
- give an overview of the commodities of foodstuff of animal origin (definitions, classification and systematics)

Reading list:

K. Fehlhaber, J. Kleer, F. Kley (Hrsg.): Handbuch Lebensmittelhygiene (2007), Behr's Verlag, ISBN: 978-3-89947-194-6

H.-J. Sinell (Hrsg.): Einführung in die Lebensmittelhygiene (2003), Parey Verlag, ISBN: 3830440952

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

"Handouts / Downloads" for each lecture block are available on the homepage of the IFTN. Scripts for meat and food evaluation can be obtained at the IFTN

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut/lehre-prufungen-1

Self-assessment:

a questionnaire is available on the homepage of the IFTN

Learning recommendations:

Students are advised to prepare and revise the content with the help of the respective handouts and in-depth reading of the relevant literature

Assessment:

an oral examination within the framework of the Veterinary Medical examination in "Meat hygiene" after the eleventh semester



ANIMAL NUTRITION PRACTICAL

Coordinator:
Eder

Instructors:
Eder and assistants

Course type:
practical (2 CHW)

ECTS:
3

Prerequisites:
participation in the courses in animal feed science and animal nutrition of the 4th and 5th semester.

Introduction:
The practical is based on the one-hour lecture on animal feed science (4th semester), the two-hour laboratory course on animal feed science (4th semester) and the two-hour lecture on animal nutrition (5th semester).

Energy and protein evaluation systems in animal nutrition, methods of the assessment of demands of nutrients and active ingredients, rationing, environmental effects of animal nutrition, diet-related diseases and dietetics for domestic and farm animals.

Overall aims and objectives:
Students should be able to:

- explain those regulations of the legislation on animal feed that are important for the veterinarian,
- describe energy and protein evaluation systems, methods for the assessment of demands of nutrients and active ingredients and recommendations on the supply for domestic and farm animals,

- describe the composition of the rationing in animal nutrition,
- explain the environmental impact of feeding, including the possible inclusion of unwanted substances in foodstuff of animal origin,
- explain the importance of quantity and trace elements and additives in animal feed,
- explain the pathogenesis of diseases caused by nutrition, including infertility and reduced performance,
- describe the fundamentals of dietetics with special regard to feed science.

Reading list:

Kamphues, J., Coenen, M., Kienzle, E., Pallauf, J., Simon, O., Zentek, J.: Supplemente zu Vorlesungen und Übungen in der Tierernährung; Schaper Verlag Alfeld-Hannover 2004, 10. Auflage, ISBN 3-7944-0205-7

Kirchgessner, M.: Tierernährung; DLG-Verlag Frankfurt/Main, 11. Auflage, ISBN 3-7690-0594-5

Electronic sources:

PowerPoint presentations

Scripts:

a script including forms for various calculations and rations calculations is available

Learning recommendations:

Students are advised to read the script before the lecture and to further study the content subsequently

Assessment:

a written examination within the framework of the Veterinary Medical Examination in "Animal nutrition" after the sixth semester

MILK HYGIENE

Coordinator:
Usleber

Instructors:
Usleber, Ackermann, Large, Wescher

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
Economic framework conditions of the dairy industry, the relevance of milk and

dairy products for human nutrition, anatomical and physiological fundamentals of milk production, ingredients of milk, milk intolerance, fundamental of milk production and milk hygiene, quality of raw milk, legal requirements for primary production, milk quality assessment.

Overall aims and objectives:

Students should be able to:

- explain the national and international relevance of milk and dairy products for human nutrition and assess the national economic relevance of the dairy industry,
- explain the development of milk constituents of the most important species and define the normal values,
- explain the most important milk constituents and assess them with regard to physical-chemical, technological and nutritional properties of milk,
- deduce the fundamentals of agricultural milk production, discuss those with regard to the production of high-quality and completely hygienic raw milk as well as the relevant regulations.

Electronic sources:

presentations of the lecture content are available in PDF-format on Stud.IP
<https://studip.uni-giessen.de/studip/>

Assessment:

a written examination within the framework of the Veterinary Medical Examination in "dairy science" after the eighth semester



7TH SEMESTER

Blocks	WEEKS	ECTS
Respiration	4	4
Cardiovascular	3	3
Gastrointestinal tract	7	7
Regular Courses	CHW	ECTS
Forensic Veterinary Medicine, Professional and ethical law L	1	1
Diseases of Fish, Reptiles and Amphibians L	1	1
Meat Hygiene and Food Science L	4	4
Poultry Diseases L	1	1
Dairy Science L	1	1
Milk Examination S	0,5	1
Dairy Science P	0,5	1
Pathological-anatomical Demonstrations P	1	1,5
Radiology L	2	2
Examination of animals for slaughter/Meat examination P	2	2
Specific Pathology S	1	1
Animal Welfare L	2	2
Elective Courses		
Examinations		
Radiology		2
Animal Welfare and Ethology		2
Partial Exam MCQ Internal Medicine		
Partial Exam MCQ Surgery and Anaesthesiology		
Partial Exam MCQ Reproductive Medicine		

L= lecture, P= practical, S=seminar

CHW = contact hour per week (Semesterwochenstunde)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Duration of block courses is given in "h =hours", 1h =45 min

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>

RESPIRATION

Summary:

Diseases of the nose (including paranasal sinuses), nasopharynx, larynx, trachea, bronchi and lung and the pleura (thorax) will be discussed in a problem-oriented manner and with regard to different species including the respective treatments. During the clinical demonstration individual patients will be presented.

Further details (e.g. reading list) on the individual courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-prufungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Examination respiratory tract – small animals L (1h)

Students should be able to:

- discuss the anatomy and physiology of the respiratory tract (including protective mechanisms),
- recognize patients with respiratory diseases by way of their typical symptoms,
- plan examination procedures for affected animals,
- summarize the main causes for cough, stridor and dyspnoea.

Diagnostic imaging respiration L (3h)

Students should be able to:

- define normal findings in radiographic images of the thorax,
- describe the most important thoracic radiographic patterns,
- classify the different imaging methods of the thorax with regard to indications,

- identify the radiographic signs of major thoracic disorders.

Nasal discharge – small animals L (1h)

Students should be able to:

- list the different qualities of nasal discharge and define key evaluation criteria of the symptoms and their anamnestic relevance,
- list symptoms associated with nasal discharge and interpret them causally,
- describe several diseases associated with the symptom of nasal discharge and discuss with regard to possible differential diagnoses (systemic and local causes),
- list suitable methods for further diagnostics and evaluate them,
- provide a plan for the problem-oriented approach of the treatment of nasal discharge and demonstrate its application with the help of case studies,
- provide suggestions for the therapeutic treatment of diseases associated with nasal discharge.

Surgery upper respiratory tract – small animals L (2h)

Students should be able to:

- discuss and define the brachycephalic syndrome,
- describe surgically important anatomical structures,
- define larynx paralyses.

Dyspnoea – small animals L (1h)

Students should be able to:

- provide a definition of the term “dyspnoea” and differentiate the term from other respiratory abnormalities,
- list the different forms of dyspnoea, describe and discuss them with regard to their causes,
- explain the patho-mechanism and the consequences of an existing breathing difficulty,

7TH SEMESTER

- enumerate different diseases located in or outside the respiratory tract that may lead to an apparent dyspnoea.

Stridor – small animals L (1h)

Students should be able to:

- list the different types of stridor and describe the tonality of pathological respiratory sounds in relation to the localisation,
- provide several differential diagnoses for the occurrence of stridor and deduce therapeutic measures for the individual diseases.

Cough – small animals L (1h)

Students should be able to:

- on the basis of the history and the results of a clinical examination group the symptom “cough” to the respiratory tract or a cardiovascular disease,
- develop a plan for further examination,
- interpret the results of further examinations in a case-related manner and eventually provide a diagnosis.

Endoscopy and BAL – small animals L (1h)

Students should be able to:

- give the indications for an endoscopic examination of the respiratory tract,
- describe the procedure of a rhinoscopy and a laryngo-tracheo-bronchoscopy,
- describe the procedure of a bronchoalveolar lavage (BAL),
- describe and interpret the results of the endoscopic examination,
- describe and interpret the results of the BAL.

Surgery lower respiratory tract – small animals L (1h)

Students should be able to:

- explain the anatomical structures of the lower respiratory tract,

- describe the surgical approach to the thorax,
- describe several surgically relevant diseases of the lung and deduce the appropriate therapeutic measures.

Surgery pleura / thorax – small animals L (1h)

Students should be able to:

- process complex cases of thoracic surgery,
- create a diagnostic and a therapeutic plan.

Clinic for Horses (Internal Medicine and Surgery) (Fey, Litzke et al.)

Examination respiratory tract – horses L (1h)

Students should be able to:

- assess the sensitivity of the findings of their clinical examinations,
- name suitable further examination methods with regard to their clinical findings,
- provide and interpret arterial blood gas parameters.

Upper respiratory tract – horses L (2h)

Students should be able to:

- name the most important non-infectious alterations of the upper respiratory tract of horses and evaluate their pathogenetic relevance.

Lower respiratory tract – horses L (2h)

Students should be able to:

- differentiate between the disease patterns of IAD, COB and COB exacerbation
- explain the main causes of lung- and pleural diseases or thoracic effusions.



Inhalation therapy – horses L (1h)

Students should be able to:

- list the most important ways of aerosol production,
- list the most commonly used apparatuses for aerosol application and discuss their advantages and disadvantages,
- discuss the problems that arise due to pharmaceutical regulations when administering inhalative medicinal products.

Surgery upper respiratory tract – horses L (2h)

Students should be able to:

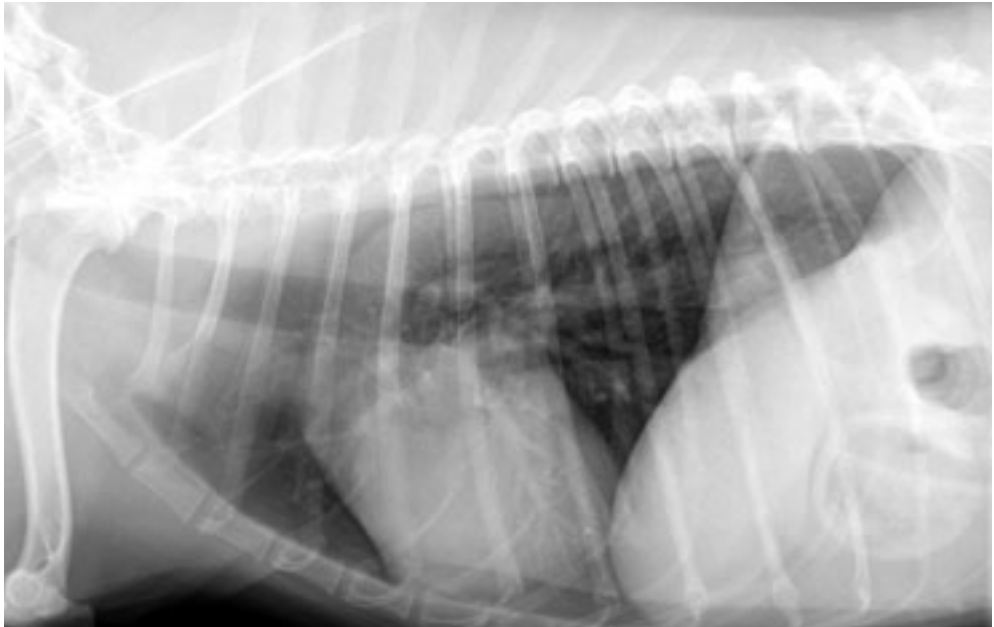
- define and explain terms of equine respiratory pathology,
- assess, classify and diagnose the respective diseases,
- discuss therapeutic measures and prognoses.

Clinic for Farm Animals (Internal Medicine and Surgery) (Doll, Reiner et al.)

Respiratory problems – ruminants: General L (4h)

Students should be able to:

- explain the characteristics of the respiratory tract of ruminants as well as methods of diagnosis for respiratory diseases concerning individual animals and larger populations,
- list and give the names of diseases of the nose, paranasal sinuses, larynx, including their respective symptoms, differential diagnosis and therapeutic methods,
- position a nose ring and describe measures that are to be taken after an accidental tearing of said ring.



Respiratory problems – ruminants: infectious bovine rhinotracheitis / enzootic bronchopneumonia L (1h)

Students should be able to:

- explain the causes and symptoms of the infectious bovine rhinotracheitis and suggest therapeutic and prophylactic measures with regard to animal health regulations,
- describe the clinical and economic relevance of enzootic bronchopneumonia in cattle as well as explain the causes of this disease complex, symptoms, diagnostic measures, prognosis and therapeutic and prophylactic methods.

Respiratory problems – ruminants: different disease patterns L (1h)

Students should be able to:

- recognize the following respiratory diseases in cattle by means of their clinical symptoms, describe the necessary diagnostic measures and suggest measures for therapy and prophylaxis:
 - BRSV infection
 - aspiration pneumonia
 - emphysema including fog fever
 - lung worm infestation.

Respiratory problems – ruminants: small ruminants L (1h)

Students should be able to:

- recognize the following respiratory diseases in sheep and goats by means of their clinical symptoms, describe the necessary diagnostic measures and suggest measures for therapy and prophylaxis:
 - nasal warble infestation
 - ethmoid bone-carcinoma
 - viral and bacterial pneumonia
 - verminous bronchopneumonia
 - Maedi
 - Jaagsiekte

PRRS – swine L (1h)

Students should be able to:

- give a structured overview of the forms of respiratory diseases in pigs,
- explain the etiology and pathogenesis of “porcine reproductive and respiratory syndrome (PRRS)” and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for PRRS, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of PRRS.

Influenza A L (1h)

Students should be able to:

- explain the etiology and pathogenesis of swine influenza and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for these diseases, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,

- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Atrophic rhinitis L (1h)

Students should be able to:

- explain the etiology and pathogenesis of atrophic rhinitis and pneumonia caused by pasteurillae and bordetellae and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for Atrophic rhinitis pneumonia caused by pasteurillae and bordetellae, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Mycoplasma L (1h)

Students should be able to:

- explain the etiology and pathogenesis of infections of mycoplasma hyopneumonia and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,

- list possible and important differential diagnoses for infections of mycoplasma hyopneumonia, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

APP L (1h)

Students should be able to:

- explain the etiology and pathogenesis of actinobacillus pleuropneumonia and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for actinobacillus pleuropneumonia, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

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Respiration – swine: miscellaneous L (1h)

Students should be able to:

- explain the etiology and pathogenesis of respiratory disorders in pigs (e.g. lung worms) and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for respiratory disorders in pigs (e.g. lung worms), assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and



prophylaxis and rate the suitability of methods,

- rate the economic relevance of the diseases.

Respiration therapy – swine L (1h)

Students should be able to:

- discuss the characteristics of the therapy and prophylaxis of respiratory diseases in pigs and provide examples.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Anti-infectives – fundamentals of anti-infective therapy and resistance L (1h)

Students should be able to:

- explain the history of anti-infective therapy,
- explain the basic principles for the application of anti-infectives.

Anti-infectives – anti-bacterial chemotherapy – sulphonamides L (1h)

Students should be able to:

- depict the history of sulphonamides,
- provide explanations on their structure, site of action, side effects, possible uses and resistance situation.

Anti-infectives – anti-bacterial chemotherapy – nitrofurans, nitroimidazoles, “chinolones” L (1h)

Students should be able to:

- show that they have acquired knowledge on the structure, site of action, side effects, possible uses and the resistance situation.

Pharmacology of respiration L (1h)

Students should be able to:

- explain several causes and symptoms of respiratory problems,
- explain respiratory processes,
- demonstrate knowledge of the

patho-physiology and therapy of the bronchial muscles,

- assess the numerous possibilities of therapeutic intervention, including potential unwanted side effects outside the respiratory tract,
- assess inflammatory and non-inflammatory pathological processes of the respiratory tract when selecting therapeutics,
- explain the special measures that have to be taken in the case of asthma and “chronic obstructive pulmonary disease” (COPD).

Institute of Veterinary Pathology Reinacher, Herden, et al.)

Pathology respiration L (4h)

Students should be able to:

- identify the pathological processes and developments in domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical appearance,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological diagnoses and discuss differential diagnoses.

A detailed list of the topics is available online at StudIP:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (8h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Applied respiratory physiology (Comprehensive Course) (1h)

Students should be able to:

- describe accurately the oxygen exchange of the lung,
- explain the compliance of the lung (including surfactant).

Parasites respiratory tract – small animals (Comprehensive Course) (2h)

Students should be able to:

- list the characteristic symptoms of a parasitic infestation of the respiratory tract,
- describe procedures for the diagnosis of a possible parasitic infestation and list therapeutic measures in the case of a positive test result,
- describe the most common parasites of the respiratory tract and their preferred localisation in dogs and cats and describe possible ways of infection.

Radiography / auscultation / endoscopy (Comprehensive Course) (3h)

Students should be able to:

- depict the anatomical features of the upper and lower respiratory tract, and, on the basis of radiographic or endoscopic images, differentiate between pathological and physiological conditions,
- assess thoracic radiographic images and give differential diagnoses,
- review endoscopic images and give differential diagnoses,
- describe how to perform an endo-

scopic examination of the upper respiratory tract,

- recognize the signs of common cardiovascular diseases in radiographic images,
- explain cardiovascular developments in radiographic images with the help of case studies.

Respiratory tract – virology (Comprehensive Course) (1h)

Students should be able to:

- describe the structure and the pathogenic mechanisms resulting from influenza A and list various viral subtypes,
- describe direct and indirect detection methods for influenza A virus and provide knowledge on the therapy and prophylaxis of possible infections,
- present in detail the epidemiology of an infection of feline calicivirus as well as methods of virus diagnostics,
- describe methods of passive and active immunization for feline calicivirus and comparatively evaluate their effectiveness,
- discuss the epidemiology, clinical manifestations, diagnostics and therapy of the most common viral diseases of the equine respiratory tract (influenza, EVA, para-influenza, herpes),
- list preventative measures for viral respiratory diseases.

Bacteriology respiration – livestock (Comprehensive Course) (1h)

Students should be able to:

- explain the clinical and economic relevance of the most important infectious respiratory diseases in cattle and small ruminants,

- describe the symptoms that occur, as well as the diagnostic measures that need to be taken for the etiological clarification of such diseases,
- point out suitable measures of treatment and prophylaxis for individual animals and the livestock in general,
- name the infectious and non-infectious factors that may be involved and their relevance for the diseases.

Bacteriology respiratory tract – small animals / horses (Comprehensive Course) (2h)

Students should be able to:

- list frequent infectious diseases of the respiratory tract of dogs, cats and horses, including their viral and bacteriological causes and their pathogenicity,
- provide knowledge on the epidemiology of canine infectious tracheo-bronchitis
- and describe the clinical symptoms of the disease,
- describe the patho-mechanisms of the bacterium *Bordetella bronchiseptica* that causes the kennel cough complex and the resulting clinic,
- discuss the leading symptoms of the cat flu complex with regard to the pathogens involved,
- depict the symptoms of the so-called “new disease” (Hemorrhagic-like Fever) with regard to the infection with a highly virulent strain of feline calicivirus,
- list therapeutic and prophylactic measures with regard to infectious respiratory diseases,
- describe procedures for the diagnosis and list therapeutic measures in the case of a positive test result,
- describe the indications of a therapy with anti-infectives,

- discuss the epidemiology, clinical manifestations, diagnostics and treatment of strangles,
- describe the relevance of streptococci with regard to equine strangles.

Parasitology respiration – cattle (Comprehensive Course) (1h)

Students should be able to:

- describe the symptoms and the diagnostic test of dictyocaulosis,
- discuss the therapy and prophylactic measures of an infestation with lungworms,
- explain the transmission of lungworms in cattle and possible precautions.

Mycology respiration (Comprehensive Course) (1h)

Students should be able to:

- provide epidemiological knowledge on the aspergillum infection in dogs and describe the possible symptoms of a systemic or local aspergillum infection,
- develop a therapeutic plan for mycotic rhinitis and list diagnostic measures,
- describe and discuss therapeutic measures in the case of a mycotic rhinitis,
- list different eligible species of aspergillum and consider other mycoses differential-diagnostics,
- name important sources of an aspergillum infection.

CARDIOVASCULAR SYSTEM

Summary:

Diseases of the cardiovascular system will be dealt with systematically. Based upon patho-physiological developments, the symptoms, diagnostics and treatment of acquired and congenital disorders will be discussed with regard to the different species. The respective clinical demonstrations will provide further insight into cases of cardiovascular diseases.

Further details (e.g. reading list) concerning the individual courses can be found online:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Cardiac auscultation L (1h)

Students should be able to:

- conduct an auscultation,
- assess a cardiac auscultation and in particular heart murmurs,
- list differential diagnoses for different heart murmurs.

Thoracic radiography L (2h)

Students should be able to:

- explain the procedure and technique of a radiograph of the thorax,
- assign individual radiographic images to certain diseases.

ECG L (2h)

Students should be able to:

- explain the way an electrocardiogram is produced,
- explain the evaluation process of an ECG,

- assess important ECG findings.

Echocardiography L (2h)

Students should be able to:

- list the various methods of echocardiography,
- explain the depictions in the B-and M-mode,
- explain the depictions of the colour and spectral doppler,
- explain the collection of measurement parameters,
- classify the developments in the echocardiographical measurement parameters correctly.

Blood pressure L (1h)

Students should be able to:

- define and explain the terms systolic, diastolic and mean blood pressure,
- list different methods of blood pressure measurement and assess their advantages and disadvantages,
- discuss the impact of the choice of the blood-pressure cuff on non-invasive measurements,
- assess the results of blood pressure measurement.

Myocard – small animals L (2h)

Students should be able to:

- explain the causes of a systolic function disorder,
- list the historical and clinical symptoms of a degenerative mitral valve insufficiency,
- list the findings of secondary medical examination (radiography, ECG, echocardiography) in case of a degenerative mitral valve insufficiency,
- discuss the treatment of various clinical stages of dilated cardiomyopathy,
- explain the causes of a diastolic function disorder.



- list the historical and clinical symptoms of various forms of cardiomyopathy in cats,
- list the findings of secondary medical examinations (radiography, ECG, echocardiography) of cats,
- discuss the treatment of different forms of cardiomyopathy in cats.

Endocard – small animals L (1h)

Students should be able to:

- list the causes of a mitral regurgitation,
- list the historical and clinical symptoms of a degenerative mitral regurgitation,
- list the findings of secondary medical examinations (radiography, ECG, echocardiography) in degenerative mitral regurgitation,
- discuss the different clinical degrees of mitral regurgitation.

Vascular – small animals: congenital heart diseases L (1h)

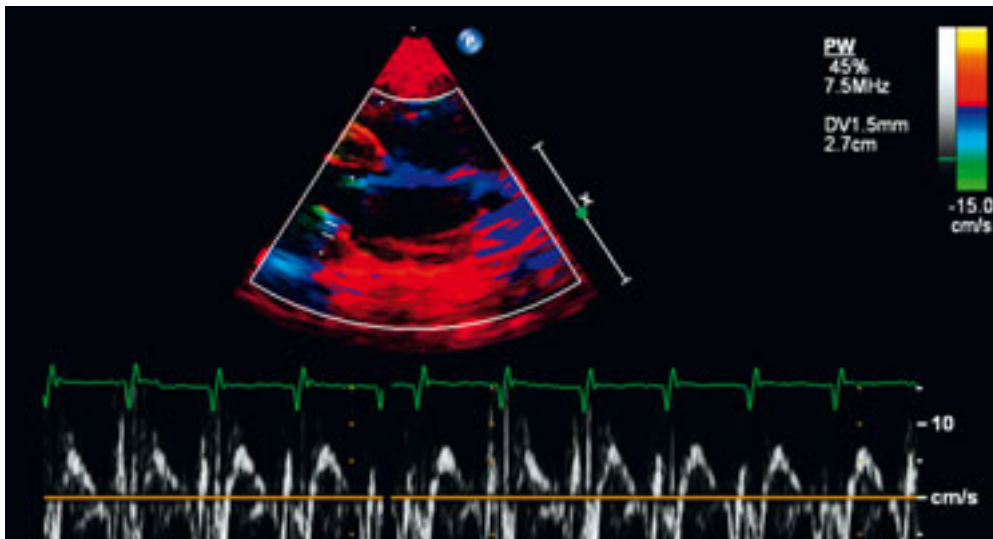
Students should be able to:

- classify congenital and vascular heart diseases,
- list the main medical findings (history, clinical, ECG, radiography, echocardiography) of common congenital heart diseases,
- discuss the medical, surgical and interventional therapy of the most common congenital heart diseases.

Pericard – small animals L (1h)

Students should be able to:

- list several pericardial diseases,
- list the historical and clinical symptoms of a pericardial effusion,
- list the findings of secondary medical examinations (radiography, ECG, echocardiography) in pericardial effusions,
- discuss the treatment of a pericardial effusion.



7TH SEMESTER

Surgery cardiovascular L (2h)

Students should be able to:

- explain the indications and guidelines for surgical measures of the heart in small animals,
- explain the indications for and the procedure of a pericardectomy,
- deduce the basic principles of a thoracotomy and sternotomy.

Clinic for Horses
(Internal Medicine and Surgery)
(Fey, Litzke et al.)

Cardiac arrhythmia – horses L (1h)

Students should be able to:

- indicate when an ECG needs to be taken,
- recognize the most important physiological equine arrhythmia,
- recognize the two main pathological cardiac arrhythmias of horses (atrial fibrillation and ventricular extra systole) in an ECG,
- name therapeutic options that can be taken in the case of an atrial fibrillation.

Morphologically tangible heart defects – horses L (1h)

Students should be able to:

- indicate when an equine echocardiography is necessary,
- describe the most important changes in equine valvular diseases and give their functional effects,
- describe the most important innate equine heart disorders,
- name therapeutic options that can be taken in the case of heart insufficiency.

Rare equine cardiovascular diseases L (1h)

Students should be able to:

- name the causes and effects of equine myo- and pericarditis,
- differentiate between equine thrombo- and periphlebitis of the Vv. jugulares,
- describe the treatment of thrombophlebitis,
- name causes and effects of equine thrombo-embolisms.

Clinic for Farm Animals
(Internal Medicine and Surgery)
(Doll, Reiner et al.)

Endocard, myocard – ruminants L (1h)

Students should be able to:

- describe the symptoms of the heart diseases in question,
- point out measures for differential diagnosis,
- classify these diseases prognostically and suggest possible treatments.

Vascular – ruminants L (1h)

Students should be able to:

- describe the following methods: how to sample blood from cattle and how to prepare venous access for injections and infusions,
- identify those diseases that have a substantial impact on the vascular system.

Pericard – ruminants L (1h)

Students should be able to:

- list the most common causes of diseases of the pericardium in cattle,
- describe the symptoms and the diagnostic, differential diagnostic and therapeutic possibilities,
- assess these prognostically.



Eperythrozoonosis L (1h)

Students should be able to:

- explain the etiology and pathogenesis of eperythrozoonosis and point out the special characteristics of the disease,
- name the clinical as well as the pathological-anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for Eperythrozoonosis, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Hypotension and shock L (1h)

Students should be able to:

- explain the development of hypotension and the corresponding compensatory mechanisms,
- define the different forms of shock,
- point out different therapeutic approaches on the basis of the site of action of the medication applied,
- treat hypotension as well as different types of shock,
- justify and differentiate the application of the drugs selected on the basis of physiological and patho-physiological circumstances.

Hypertension L (1h)

Students should be able to:

- explain the development of hypertension and the corresponding compensatory mechanisms,
- point out different therapeutic approaches on the basis of the site of action of the medication applied,
- treat hypertension as well as a hypertensive crisis,
- justify and differentiate the application of the medication selected on the basis of physiological and patho-physiological circumstances,
- explain and differentiate between unwanted effects of medication during the therapy with the substances selected.

Cardiac insufficiency L (1h)

Students should be able to:

- explain the development of heart failure and the corresponding compensatory mechanisms,
- point out different therapeutic approaches on the basis of the site of action of the medication applied,
- treat cardiac insufficiency,
- justify and differentiate the application of the medication selected on the basis of physiological and patho-physiological circumstances,
- explain and differentiate between unwanted effects of medication during the therapy with the substances selected.

Anti-arrhythmia L (1h)

Students should be able to:

- differentiate between ionic currents and working myocardium in pacemaker cells,
- explain the causes and classification of cardiac arrhythmia,
- name anti-arrhythmic drugs of the classes I-IV that are used in therapy

and explain different therapeutic approaches on the basis of the site of action of the medication applied,

- treat cardiac arrhythmia,
- justify and differentiate the application of the medication selected on the basis of physiological and pathophysiological circumstances,
- explain and differentiate between unwanted effects of medication during the therapy with the substances selected and outline counter-measures.

**Institute of Veterinary Pathology
(Reinacher, Herden, et al.)**

Cardiovascular Pathology L (3h)

Students should be able to:

- identify the pathological processes and developments in domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical appearance,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological diagnoses and discuss differential diagnoses.



A detailed list of the topics is available online at:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (6h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Patho-physiology heart (Comprehensive Course) (2h)

Students should be able to:

- explain the basic mechanisms of cardiovascular regulation,
- explain the relationship between preload, afterload, contraction and blood pressure,
- classify the different types of cardiac insufficiency,
- list the symptoms of cardiac insufficiency,
- discuss the different categories of heart insufficiency.

ECG, radiography, auscultation (Comprehensive Course) (3h)

Students should be able to:

- conduct an auscultation,
- assess a radiographic image of the heart,
- evaluate an ECG.

ECG interpretation (Comprehensive Course) (2h)

Students should be able to:

- explain the way an electrocardiogram is produced,
- explain the evaluation process of an ECG examination,
- assess important ECG findings,
- recognize ventricular arrhythmias,
- recognize supraventricular arrhythmias,

- recognize atrioventricular (AV) blocks,
- recognize bundle branch blocks.

Blood pressure demonstration (Comprehensive Course) (2h)

Students should be able to:

- define and explain the terms systolic, diastolic and mean blood pressure,
- list different methods of blood pressure measurement and assess their advantages and disadvantages,
- discuss the impact of the choice of the blood-pressure cuff on non-invasive measurements,
- assess the results of blood pressure measurement.
- list indications for the taking of blood pressure,
- describe the fundamental therapeutic strategies influencing blood pressure.

Bacteriology and virology heart (Comprehensive Course) (1h)

Students should be able to:

- list the most important bacterial and viral cardiac and vascular diseases,
- list the clinic and symptoms of endocarditis,
- explain the treatment of endocarditis.

Parasitology heart / vascular (Comprehensive Course) (1h)

Students should be able to:

- list the main causes of pulmonary hypertension,
- explain the clinic and further findings in the case of pulmonary hypertension,
- explain the parasitic diseases of the pulmonary arteries.

GASTROINTESTINAL TRACT

Summary:

Diseases of the mouth (including teeth), oesophagus, stomach (including proventriculus), intestinal tract and the gastrointestinal accessory glands (liver, pancreas) are discussed in a problem-oriented manner with regard to the different species. The respective clinical demonstrations will provide an insight into individual cases.

Further details (e.g. reading list) on the individual courses can be found online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Oesophagus – small animals L (1h)

Students should be able to:

- explain the physiology of swallowing and pathological deviations,
- distinguish between vomiting and regurgitation,
- list the causes of regurgitation and explain the necessary diagnostic tests,
- list the causes of a megaesophagus,
- discuss the appropriate treatment, depending on the underlying cause.

Surgery oral cavity L (1h)

Students should be able to:

- deduce and define the different surgical methods that can be used in the oral cavity,
- discuss surgical limits and complications of surgery in the oral cavity,

- list the different surgically relevant diseases.

Vomiting – small animals L (1h)

Students should be able to:

- explain the pathogenesis of the vomiting reflex,
- enumerate the causes of vomiting according to different categories,
- discuss the diagnostic measures with regard to history and clinical examination for animals suffering from vomiting,
- explain possible therapeutic approaches, including anti-emetic treatment and its interaction with the receptors.

Gastritis – small animals L (1h)

Students should be able to:

- discuss the structure of and secretion within the stomachs of healthy and sick animals,
- enumerate the causes of an acute, respectively chronic gastritis,
- discuss therapeutic approaches to reduce stomach acid and other measures in the case of an acute gastritis,
- explain immunological principles of the cause and treatment for chronic gastritis within the IBD-complex.

Gastric dilatation-volvulus complex L (2h)

Students should be able to:

- recognize gastric torsion in dogs, initiate the first steps of treatment and at least theoretically report the operation,
- define the different forms of gastropexie,
- assess the complications and prognosis of this procedure.

Small bowel disease – small animals L (1h)

Students should be able to:

- repeat the anatomy and physiology (secretion, digestion, absorption) of the intestinal tract,
- discuss the mechanisms and effect of the intestinal associated lymphoid tissue and the intestinal micro-flora,
- explain the motility and its disorders within the intestinal tract.

Small bowel diarrhoea – small animals L (1h)

Students should be able to:

- list and diagnose infectious causes of small bowel diarrhoea,
- discuss the patho-physiology, diagnosis, and therapy of inflammatory bowel disease (IBD),
- recognize and diagnose the causes of a protein loss enteropathy,
- discuss and diagnose other causes of small bowel diarrhoea,
- list neoplastic bowel diseases.

Imaging gastrointestinal tract L (2h)

Students should be able to:

- perform and explain a contrast study,
- recognize and discuss radiographic symptoms of characteristic GI diseases (e.g. ileus, gastric torsion, intussusceptions, etc.),
- interpret ultrasound images of the GI-tract.

Large bowel diarrhoea – small animals L (1h)

Students should be able to:

- discuss the anatomy and physiology (motility, micro-flora, immunology),
- list and diagnose causes of large bowel diarrhoea,
- provide therapeutic measures for large bowel diarrhoea.

Surgery intestinal tract – small animals L (2h)

Students should be able to:

- define and apply the surgical terms that refer to the small intestine,
- explain surgical diseases of the small bowel,
- theoretically explain small bowel surgery,
- explain the anatomical differences between the small and large intestines,
- explain the surgical measures of the large intestine and their special characteristics,
- define the most important surgical measures that are used during surgery of the large intestine.

Constipation and faecal incontinence – small animals L (1h)

Students should be able to:

- discuss the motility of the large intestine,
- list the causes of constipation and start the appropriate diagnostics in each case,
- discuss the patho-physiology, epidemiology and treatment of feline megacolon,
- explain the prophylactic measures that have to be taken in the case of constipation.

Endoscopy gastrointestinal tract L (1h)

Students should be able to:

- recognize the indications for an endoscopy,
- describe the procedure of a normal endoscopy,
- discuss the complications and contraindications of an endoscopy.

Liver diseases – small animals L (3h)

Students should be able to:

- recognize the symptoms of a hepatopathy,

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- discuss the laboratory findings of liver disease,
- enumerate aetiopathogenetic diagnoses of liver diseases in dogs and cats,
- discuss the patho-physiology and clinic of hepatoenzephalopathy,
- explain possible treatments of liver diseases.

Surgery anus – small animals L (1h)

Students should be able to:

- recognize and address the basic anatomical structures in the anal area,
- list, classify and define diseases of the anal and peri-anal area.

Imaging liver / pancreas L (2h)

Students should be able to:

- assign characteristic radiographic and ultrasonographic images to certain diseases of the liver and pancreas,
- name and evaluate the different imaging techniques in order of importance.

Surgery liver and pancreas – small animals L (3h)

Students should be able to:

- define diseases in the area of the liver, gall bladder, pancreas and explain their therapeutic possibilities,
- explain the theoretical fundamentals of surgical interventions,
- explain the use of staplers.

Pancreas – small animals L (1h)

Students should be able to:

- discuss the anatomy and physiology of the pancreas (including the protective mechanisms that prevent auto-digestion),
- discuss laboratory tests that can be used to diagnose a pancreatic disease,
- explain therapeutic measures that can be taken in the case of pancreatitis and exocrine pancreatic insufficiency.

Surgery hernia – small animals L (1h)

Students should be able to:

- define the term hernia,
- explain the aetiology, aetio-pathogenesis, clinics, diagnostics and treatment of various hernias,
- define and explain the difference between hernia diaphragmatica and diaphragmatic rupture.

Cytology liver / pancreas L (2h)

Students should be able to:

- enumerate the most important indications to perform a liver cytology,
- list and explain sampling techniques and techniques for the preparation of cytological specimens of the liver and pancreas,
- list the cytological characteristics of hepatocytes,
- list the types of inflammation on the basis of the dominant cell population,
- list the degenerative developments of hepatocytes that can be recognized in the cytological specimen and explain their possible aetiology,
- list primary and secondary liver tumours,
- list changes in the pigmentation of hepatocytes that can be recognized cytologically.

Clinic for Horses
(Internal Medicine and Surgery)
(Fey, Litzke et al.)

Introduction to and changes of the equine oral cavity L (1h)

Students should be able to:

- describe the patho-physiological characteristics of horses' teeth
- identify and document the most common dental problems of the horse,
- name the most important differential diagnoses of oral and pharyngeal dysphagia.

Diseases of the equine oesophagus and stomach L (2h)

Students should be able to:

- identify a pharyngeal obstruction and name treatment methods,
- enumerate the complications of a pharyngeal congestion,
- differentiate between primary and secondary stomach overloading,
- identify and treat parasites of the equine stomach.

Small intestine and Equine Gastric Ulcer Syndrome (EGUS) – horses L (1h)

Students should be able to:

- classify ulcers in the mucosa of the equine stomach,
- name therapeutic options and modes of action in the case of these ulcers,
- recognize the symptoms of gastroduodenal jejunitis,
- diagnose an ileum constipation,
- explain the symptoms of infiltrative enteritis.

Large intestine (colon) – horses L (1h)

Students should be able to:

- list the possibilities concerning the diagnostics of diseases of the equine colon,
- define and explain the main physiological and patho-physiological mechanisms of the function of the colon,
- describe the disease pattern of specific diseases of the equine colon,
- name the fundamental principles of the therapy of diseases of the equine colon.

Emaciation and diarrhoea – horses L (1h)

Students should be able to:

- name suitable further methods of examination in the case of emaciation and diarrhoea,
- explain the main causes of chronic emaciation of the horse,

- provide examples of diseases that have these symptoms.

Liver – horses L (1h)

Students should be able to:

- list the possibilities concerning the diagnostics of equine liver diseases,
- define and explain the main physiological and patho-physiological mechanisms of the function of the equine liver,
- describe the disease pattern of specific diseases of the equine liver,
- name the fundamental therapeutic principles of equine liver diseases.

Teeth – horses L (1h)

Students should be able to:

- explain the dental examination of horses,
- define how to determine the age of horses by examining their teeth,
- apply theoretically acquired knowledge concerning dental grating,
- identify and assess the diseases and discuss therapeutic methods.

Surgery Colic – horses L (1h)

Students should be able to:

- recognize the symptoms of a colic,
- in theory know the examination procedure in the case of a colic,
- define different forms of colic.

Surgery Colic – horses L (1h)

Students should be able to:

- describe the procedure of a colic surgery in general terms,
- define the postoperative care,
- name postoperative complications.

Surgery Colic – horses L (1h)

Students should be able to:

- define and explain the different diseases of the equine small intestine,
- discuss treatment methods,

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- explain the principles of stabilisation for an animal suffering from a colic,
- define diagnostic measures prior to colic surgery,
- describe the most important surgical methods in the case of equine colic.

Surgery upper digestive tract – horses L (1h)

Students should be able to:

- define the different diseases of the upper gastrointestinal tract,
- discuss the treatment of diseases of the upper digestive tract.

Large intestine (colon) – horses L (1h)

Students should be able to:

- explain and define the different diseases of the equine large intestine,
- discuss the therapeutic methods.

Intensive therapy gastrointestinal tract – horses L (1h)

Students should be able to:

- apply the theoretical knowledge acquired and attend to a horse suffering from a colic after the surgery.

**Clinic for Farm Animals
(Internal Medicine and Surgery)
(Doll, Reiner et al.)**

Mouth and tongue – ruminants L (1h)

Students should be able to:

- point out the causes previously discussed of changes in the areas of mouth and tongue,
- diagnose these changes based upon their symptoms,
- propose options of differential diagnostic clarification,
- classify these diseases prognostically and, if necessary, propose a suitable treatment.

Oesophagus – ruminants L (1h)

Students should be able to:

- name the causes of throat diseases discussed, diagnose these changes and, if the disease can be treated, suggest suitable treatment methods.

Proventriculus diseases L (2h)

Students should be able to:

- explain the significance of the proventriculus system for the health and productivity of cattle,
- name the factors that influence the state of the proventriculus system,
- diagnose such disorders,
- name suitable treatment methods that may prevent or therapeutically treat these disorders.

Colic – ruminants L (1h)

Students should be able to:

- describe the causes of bovine colic,
- describe the symptoms,
- describe the differential diagnostic approach,
- suggest treatment methods.

Diarrhoea calves / cattle L (1h)

Students should be able to:

- explain the causes, symptoms and pathological effects of the types of diarrhoea discussed,
- classify these diseases diagnostically and, if the disease can be treated, suggest suitable treatment methods
- name concepts of prophylaxis.



Intestine– ruminants L (1h)

Students should be able to:

- explain the bovine intestinal diseases previously,
- describe the symptoms, the diagnostic approach and possible therapeutic measures.

Liver – ruminants L (2h)

Students should be able to:

- describe the occurrence, causes and symptoms (including diagnosis and differential diagnostics) of liver diseases,
- classify the diseases prognostically,
- name adequate methods of treatment and prophylaxis.

Rumen fluid L (1h)

Students should be able to:

- understand the importance of the proventricular digestion for the feeding of ruminants,
- explain its underlying influences,
- explain how rumen fluid can be obtained for examination, which insights can be gained from its analysis and how such an examination can be held under practical conditions.

Clostridia– swine L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of clostridia diarrhoea and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for clostridial diarrhoea, assess them with regard to their probability and name diagnostic approaches for their differentiation,

- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Salmonellosis L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of salmonellosis and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for salmonellosis, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

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Gastrointestinal tract – swine: coccidia L (1h)

Students should be able to:

- explain the etiology and pathogenesis of *Isospora suis* and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for *Isospora suis*, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and

prophylaxis and rate the suitability of methods,

- rate the economic relevance of the disease.

Gastrointestinal tract – swine: dysentery L (1h)

Students should be able to:

- explain the etiology and pathogenesis of dysentery in pigs and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for dysentery in pigs, assess them with regard to their probability and name diagnostic approaches for their differentiation,





- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Gastrointestinal tract – swine: E.coli-dysentery L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of coli-dysentery in lactating piglets, and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,

- list possible and important differential diagnoses for coli-dysentery in lactating piglets, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Gastrointestinal tract – swine: coli enterotoxaemia L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of coli enterotoxaemia and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for coli enterotoxaemia, assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.



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Gastrointestinal tract – swine: ileitis L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of ileitis and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for ileitis and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Gastrointestinal tract – swine: nematodes L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of gastrointestinal nematodes in pigs and point out the special characteristics of the disease,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for gastrointestinal nematodes in pigs and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,

- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the disease.

Gastrointestinal tract – swine: non-infectious causes I + II L (2h)

Students should be able to:

- explain the aetiology and pathogenesis of non-infectious gastrointestinal diseases (specifically the feed) and point out the special characteristics of the diseases,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for non-infectious gastrointestinal diseases in pigs and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Corona viruses – swine L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of diseases caused by corona viruses in pigs and point out the special characteristics of the diseases,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and



its prognosis,

- list possible and important differential diagnoses for diseases caused by corona viruses in pigs and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Rota virus – swine L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of diseases caused by rota viruses in pigs and point out the special characteristics of the diseases,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for diseases caused by rota viruses in pigs and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Mycotoxins – swine L (1h)

Students should be able to:

- explain the aetiology and pathogenesis of mycotoxicoses, especially DON and zearalenone, and point out the special characteristics of the diseases,
- name the clinical as well as the pathological, anatomical and histological symptoms and apply them with regard to the development of the disease and its prognosis,
- list possible and important differential diagnoses for mycotoxicoses and assess them with regard to their probability and name diagnostic approaches for their differentiation,
- initiate diagnostics for this specific disease and case and discuss possible results,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis and rate the suitability of methods,
- rate the economic relevance of the diseases.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Antiemetics L (1h)

Students should be able to:

- recognize vomiting as a symptom indicating several causes,
- suggest therapeutic methods based upon the causes present,
- assess whether there is a universal-antiemetic,
- assess the suitability of the different substances, to some extent as single therapy (in the case of cinetoses) or in combination with multiple antiemetics.

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Pharmacology ulcer L (1h)

Students should be able to:

- explain the structure of gastric mucosa,
- explain the different stimulatory and inhibitory mechanisms of acid secretion (parietal cell; including the ECL-cells involved (histamine, gastrin)) and the vegetative nervous system,
- explain the patho-physiology of ulcerative gastropathy,
- discuss the numerous methods of therapeutic intervention, also with regard to pharmacokinetics (effect duration) of the different active substances, including possible side effects that may occur,
- apply different therapeutic approaches on the basis of the selective targets of ulcer therapeutics,
- develop the biochemistry of acidification as an approach to a long-lasting blocking caused by prazoles and the further development by means of non-irreversible proton pump inhibitors of the prazane-type.

Anti infectives – antibiotics: penicillins, cephalosporins L (1h)

Students should be able to:

- explain the history of penicillins and cephalosporins
- explain their structure, target, side effects, possibilities of application and resistance.

Anti infectives – antibiotics: aminoglycosides, tetracyclines, macrolides L (1h)

Students should be able to:

- explain the history of aminoglycosides, tetracyclines and macrolides,
- explain their respective structure, target, side effects, possibilities of application and resistance.

Laxatives, stypica L (1h)

Students should be able to:

- explain diarrhoea and constipation as a disorder of the intestinal water balance (intestines as H₂O-receptive organs), rather than an intestinal motility disorder,
- define therapeutic aims of intervention for the treatment of diarrhoea and constipation,
- explain the relevance of oral re-hydration in cases of enterotoxin-induced secretory diarrhoea.

Institute of Veterinary Pathology (Reinacher, Herden, et al.)

Pathology – oral cavity and pharynx, tonsils, oesophagus, rumen, stomach, intestine, liver, pancreas and abdomen (total 12h)

Students should be able to:

- identify the pathological processes and conditions of domestic animals,
- explain the entities that concern individual organ systems,
- define and classify the diseases and explain them comprehensively in context to the clinical image,
- explain the aetiology and pathogenesis of the alterations as well as make the correct morphological diagnosis and discuss differential diagnoses.

A detailed list of topics is available online at StudIP:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (14h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Physiology of swallowing and mastication (Comprehensive Course) (1h)

Students should be able to:

- discuss the mechanisms of mastication and the production of saliva in different species,
- describe the physiology of swallowing from mouth to stomach.

Teeth – small animals (Comprehensive Course) (3h)

Students should be able to:

- solve problems concerning dental diseases and create a therapeutic plan.

Teeth – horses (Comprehensive Course) (2h)

Students should be able to:

- recognize dental diseases in animals and discuss possible therapeutic methods,
- practically determine the animal's age by examining its teeth.

Physiology stomach (Comprehensive Course) (1h)

Students should be able to:

- describe the physiology of the normal vomiting reflex,
- discuss the production of stomach acid and other digestive products of the stomach,
- explain the normal motor function of the stomach.

Physiology small intestine (Comprehensive Course) (1h)

Students should be able to:

- describe the normal physiology of digestion within the small intestine,
- discuss issues that influence the digestion.

Virology gastrointestinal tract – small animals (Comprehensive Course) (1h)

Students should be able to:

- name the individual diseases caused by viruses in the gastrointestinal tract in
- small animals and differentiate between them according to different criteria,
- explain measures that can clarify the diagnosis.

Physiology large intestine/colon (Comprehensive Course) (1h)

Students should be able to:

- discuss the mechanisms of water re-absorption from the colon,
- explain the ordinary defecation,
- describe the ordinary digestive processes and immunological processes of the large intestine.

Parasites gastrointestinal tract – small animals (Comprehensive Course) (2h)

Students should be able to:

- discuss clinically relevant aspects of the treatment of and prophylaxis against gastrointestinal parasites,
- discuss common parasites of the gastrointestinal tract of dogs and cats including their life cycles and transmission paths.

Bacteriology gastrointestinal tract (Comprehensive Course) (1h)

Students should be able to:

- explain the aetiology and pathogenesis of diarrhoea and point out the special features of the pathogens,
- classify the different pathogens of diarrhoea and assess their clinical relevance,
- explain common gastrointestinal bacteria and their spreading,
- demonstrate suitable therapeutic measures and measures of meta- and prophylaxis,
- assess the zoonotic potential of the pathogens and the risk of infection for humans.

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Parasites gastrointestinal tract – horses (Comprehensive Course) (1h)

Students should be able to:

- specify the typical clinical symptoms of the most important equine endoparasites,
- list suitable measures to reduce the rate of parasitic infections of a stock,
- explain which specific features of the small strongylids make it the most important parasite.

Parasitology gastrointestinal tract – cattle (Comprehensive Course) (1h)

Students should be able to:

- list possible treatment of and prophylaxis against common bovine gastrointestinal parasites,
- identify common bovine gastrointestinal parasites.

Intestinal pharmacology (Comprehensive Course) (2h)

Students should be able to:

- present knowledge on intestinal physiology and the relevance of the coordination (by means of the enteric and vegetative nervous system) of resorption, secretion and motility of a normal intestinal passage,
- explain the patho-physiology of diarrhoea and constipation,
- weigh the numerous possibilities of therapeutic intervention, including unwanted potential effects.

Anatomy liver pancreas (Comprehensive Course) (1h)

Students should be able to:

- apply the basic anatomic principles of the liver and pancreas in the clinic,
- show in particular the mechanisms of blood supply and innervations.

Physiology liver (Comprehensive Course) (1h)

Students should be able to:

- discuss the main processes of metabolism of the liver (including the metabolisms of bilirubin and bile acid),
- describe the regeneration processes of the liver,
- enumerate the components of immune defence of the liver.

Physiology pancreas (Comprehensive Course) (1h)

Students should be able to:

- list the production of digestive enzymes of the pancreas,
- discuss the mechanisms preventing auto-digestion.

Dietetics – small animals (Comprehensive Course) (1h)

Students should be able to:

- discuss the relevance of diet in cases of a disease of the gastrointestinal tract,
- avoid the most common feeding errors when gastrointestinal symptoms occur,
- assess the digestibility of commonly used food components,
- use the correct feed for the respective disorders,
- explain important aspects of the diagnosis and treatment of feed intolerances or allergies.

Cytology of liver and pancreas (Comprehensive Course) (3h)

Students should be able to:

- classify cytological specimens according to the categories normal, inflammation or neoplasia,
- list common cytological findings of liver or pancreas specimens.



HUSBANDRY AND DISEASES OF FARMED FISH AND REPTILES/AMPHIBIANS

Coordinator:
Lierz

Instructors:
Nilz, Heuser

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

Ornamental and farmed fish:

As far as ornamental and farmed fish are concerned, diseases that are caused by environmental circumstances and the conditions of their keeping are of particular relevance. In this lecture, environmental conditions and conditions of keeping that different species of fish require will be discussed, as well as diseases that result from improper keeping. Furthermore, it will provide an insight into commercial fish farming and aquaculture and explain the basic examination methods used for fish stock and individual animals.

It will explain the procedure of minor surgical interventions and the anaesthesia required.

Reptiles/amphibians:

As far as reptiles and amphibians are concerned, diseases that are caused by housing and diet are of particular relevance. In this lecture, environmental conditions and conditions of housing that different species of reptiles and amphibians require will be discussed, as well as diseases that result from improper keeping and feeding. In addition, students will gain an insight into ex-

amination methods for reptiles and amphibians and the diagnostic possibilities. The lecture will also introduce students to anaesthesia and the most common surgical interventions used for reptiles and amphibians in the veterinary practice.

Overall aims and objectives:

Ornamental and farmed fish:

Students should be able to:

- name the necessary conditions to keep farmed fish, recognize and diagnose common husbandry mistakes and eliminate their causes,
- explain the conditions under which the most important species of ornamental fish must be kept, taking into account water quality and feeding management,
- explain the technical requirements necessary for and the problems of socialisation found in ornamental fish, find mistakes and eliminate their causes,
- conduct a complete examination of an individual animal and a fish stock,
- explain the anaesthesia and the most important minor surgical interventions in fish.

Reptiles/amphibians:

Students should be able to:

- name the necessary conditions under which reptiles and amphibians must be kept and how they must be fed,
- recognize and diagnose common mistakes in fish husbandry and eliminate their causes,
- conduct a complete examination of a reptile/amphibian and interpret the findings,
- describe the major differences between the different families of reptiles and amphibians,
- explain the anaesthesia and the most important surgical interventions in reptiles/amphibians.

7TH SEMESTER

Learning recommendations:

Edward J. Noga, „FISH DISEASE“: Diagnosis and Treatment, Mosby-Year Book, Inc., 2. Auflage, erschienen 2000, ISBN 8138 2558

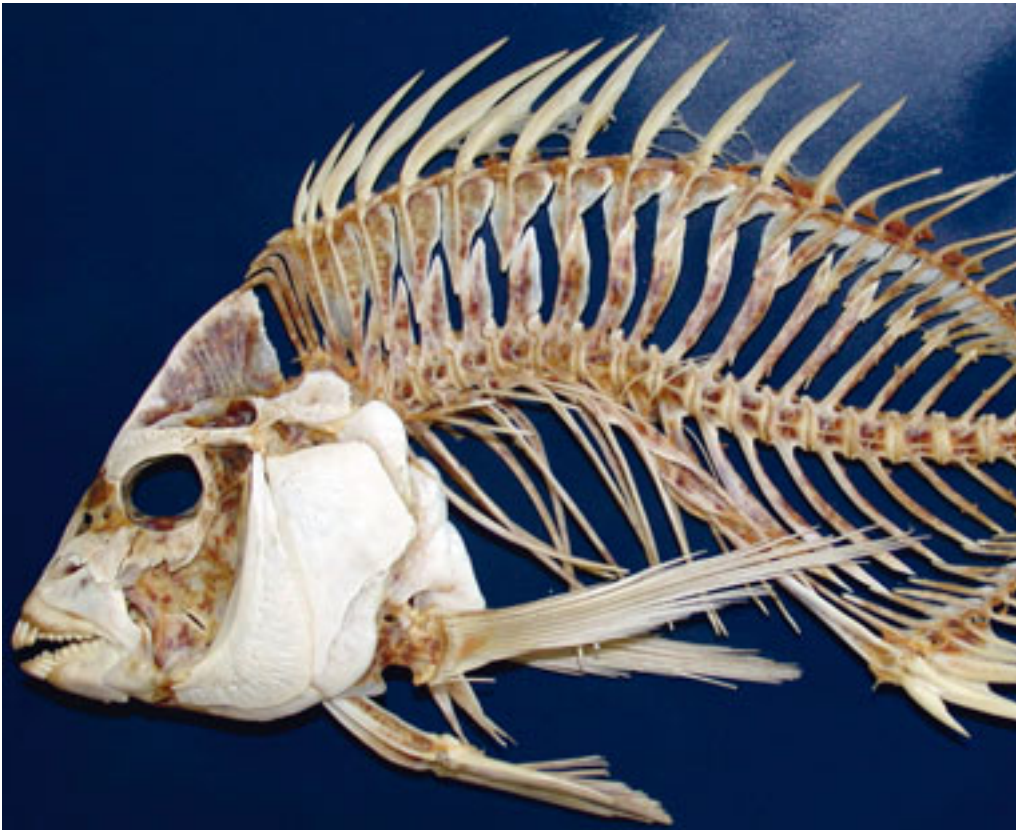
BSAVA Manuel of Ornamental Fish, von William H. Wildgoose, 304 S., 2. Auflage, erschienen bei Blackwell Pub Professional, ISBN: 978-0-905214-57-3

Mader, Reptile Medicine and Surgery, W.b. Saunders Company Jun 2007, ISBN-13: 9781416053910

Scheller und Pantchev: Parasitologie bei Schlangen, Echsen und Schildkröten, Chimaïra 2008, ISBN-13: 978-3-89973-472-0

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in “Poultry diseases” in the eleventh semester



DISEASES OF PET BIRDS, WILDFOWL AND POULTRY

Coordinator:
Lierz

Instructors:
Nilz, Heuser

Course type:
lecture (1 CHW)



ECTS:
1

Introduction:

First, the different methods of poultry farming and the industries that depend on it will be explained. Furthermore, the requirements of pet birds that are kept in captivity will be discussed. Infectious diseases are of particular relevance to poultry, but also pet birds and wildfowl populations. The following aspects will be discussed as well: aetiology, pathogenesis, epidemiology, clinic, pathology, diagnostics and treatment with particular attention being paid to viral, bacterial, mycotic and parasitic diseases.

Overall aims and objectives:

Students should be able to:

- reflect on the processes of the poultry industry and the different forms of poultry farming,
- name the requirements of pet birds that are kept in captivity,
- list the most important infectious diseases of pet birds, wildfowl and poultry and assess the relevance of an outbreak of disease for the individual animal, the stock, the population as well as for humans,
- describe the clinic and pathology of these infectious diseases and define them differential diagnostically,
- name the direct and indirect methods of detection for the respective pathogens and interpret the results of the examination
- decide whether, and if so which, therapeutic methods are suitable for the treatment of different infectious diseases,
- define and explain the possibilities of general and specific prophylaxis of different infectious diseases, in particular vaccinations

Reading list:

Siegmann, Neumann: Kompendium der Geflügelkrankheiten, Verlag: Schlütersche, 6. aktualisierte und erweiterte Auflage (2005), ISBN-13: 978-3877067444

Kaleta, Krautwald-Junghanns: Kompendium der Ziervogelkrankheiten, Verlag: Schlütersche, 3. überarbeitete Auflage 2007, ISBN-13: 9783899930221

Pees: Leitsymptome bei Papageien und Sittichen, 1. Auflage, Enke Verlag, ISBN: 3-8304-1023-9

Chitty und Lierz: BSAVA Manual of Raptors, Pigeons and Passerine Fowls, BSAVA Company, ISBN: 978-1-905319046

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Self-assessment:

a questionnaire is available at the office of the Clinic for Birds, Reptiles, Amphibians and Fish

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in "Poultry diseases" in the eleventh semester

INSPECTION OF ANIMALS FOR SLAUGHTER AND MEAT INSPECTION

Coordinator:

Bülte, Eisgruber

Instructors:

Bülte, Eisgruber, Zens (+ assistants)

Course type:

practical (2 CHW)

ECTS:

2

Introduction:

The practical (of a total of 30 hours per group) will serve to

- present technological procedures of a slaughterhouse,
- reason and demonstrate of the official inspection of animals for slaughter and meat (in particular concerning pigs and cattle) including the rules and regulations of meat hygiene control,
- carry out a bacteriological examination and other laboratory tests,
- give an expert opinion on post-mortem inspections.

Overall aims and objectives:

Students should be able to:

- explain the principles and legal requirements of the official inspection of ante and post mortem meat inspection,
- independently undertake an official meat inspection (including further examinations),
- write a certificate giving the result of the official meat inspection,
- give an insight into the individual processes of meat production.



Reading list:

A. Vallant: Farbatlas der Schlachttierkörper-Pathologie bei Rind und Schwein (2004), Verlag: Enke; 1. Auflage (2003), ISBN-13: 978-3830410171

Verordnung (EG) Nr.854/2004, inkl. der Verordnung zur Durchführung von Vorschriften zum gemeinschaftlichen Lebensmittelhygienerecht (BRD 2007)

Electronic sources:

are available on the homepage of the Institute of Veterinary Food Science (IFTN):
http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

"Handouts /downloads" for each lecture block can be found on the homepage of the IFTN:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut/lehre-prufungen-1

Self-assessment:

a questionnaire is available at the homepage of the IFTN:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut/lehre-prufungen-1

Learning recommendations:

Students are advised to prepare themselves with the help of the respective handouts and a thorough reading of the relevant literature

Maximum of participants:

4 groups of 60 students (or 12 subgroups of 20 students)

Assessment:

during the practical, pre-examinations at the beginning of each day ; an oral and a practical examination within the framework of the Veterinary Medical Examination in "Meat hygiene" in the eleventh semester





FOOD SCIENCE AND MEAT HYGIENE

Coordinator:
Bülte, Eisgruber

Instructors:
Bülte, Eisgruber, Zens

Course type:
lecture (4 CHW)

ECTS:
4

Introduction:

The course will serve to

- obtain further knowledge on the topic of meat hygiene on the level of meat production and the placing on the market,
- give information concerning the duties of the official veterinarian in the field of meat hygiene,

- give information concerning the legal rules and regulations regarding the official inspections and the placing on the market of meat

Overall aims and objectives:

Students should be able to:

- give an insight into the historical development of meat hygiene and the Meat Hygiene Law (FRG and EU),
- explain the individual processes of meat production (including the laws and regulations),
- explain the principles and legal requirements regarding the official ante and post mortem inspection of animals for slaughter and (including laboratory tests) of domestic mammals (including poultry and game),
- describe the decisions and measures of labelling concerning this matter,



- explain the principles and legal requirements regarding the placing on the market (including the microbiological criteria) of meat,
- discuss the regulations regarding the import, export and transit of foodstuff of animal origin,
- explain the legal requirements regarding the disposal of confiscates.

Reading list:

D. M. Beutling: Lehrbuch der Schlacht- und Fleischuntersuchung (2003), Verlag: Parey Bei Mvs; 1. Auflage (2003), ISBN-13: 978-3830440987 (exkl. der veralteten Rechtsmaterie)

Verordnungen zum „EU-Hygienepaket“ (2004), inkl. der Verordnung zur Durchführung von Vorschriften zum gemeinschaftlichen Lebensmittelhygienerecht (BRD 2007)

Electronic sources:

are available at the homepage of the Institute of Veterinary Food Science (IFTN):

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

“Handouts/downloads” for each lecture block can be found on the homepage of the IFTN:

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut/lehre-prufungen-1

Self-assessment:

a questionnaire is available on the homepage of the Institute of Veterinary Food Science (IFTN):

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut/lehre-prufungen-1

Learning recommendations:

Students are advised to prepare themselves with the help of the respective handouts and a thorough reading of the relevant literature.

Assessment:

an oral and a practical examination within the framework of the Veterinary Medical Examination in “Meat hygiene” in the eleventh semester.

SPECIFIC PATHOLOGY

Coordinator:
Reinacher

Instructors:
Henrich, Herden, Huisinga, Köhler, Reinacher

Course type:
seminar (1 CHW)

ECTS:
1

Requirements:

Students must have attended the lecture on “General pathology” and the seminar on “General pathology”.

Introduction:

Important aspects of essential fields of specific pathology will be dealt with in discourse.

The topics will be announced at the beginning of semester and are available at StudIP. Students are going to prepare the respective topics individually. During the seminar, questions and problems will be



debated and discussed on the basis of visual material that will be presented.

Among others, the following topics will be discussed: sampling in sections, biopsy, leucosis, skin tumours, differential diagnostics of encephalitis, metabolic bone diseases, classification and forms of pneumonia, the infection with the porcine circo virus, pericarditis and endocarditis, mammary tumours, FIP, erysipelas, swine fever, differential diagnostics of stomatitis, differential diagnostics of changes in equine colic, parvovirus.

The current list of the topics of the semi-

nar will be available at StudIP for all participants of the seminar.

Overall aims and objectives:

Students should be able to:

- comprehensively discuss and explain the topics that were dealt with

Reading list:

Dahme/Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke; 6. völlig neu bearb. Auflage (2007), ISBN-13: 978-3830410485

McGavin/Zachary: Pathologic Basis of Veterinary Disease, Verlag: Mosby; 4th ed. (2006), ISBN-13: 978-0323028707

respectively the translated version: Pathologie der Haustiere: Allgemeine, spezielle und funktionelle Veterinärpathologie- mit Zugang zum Elsevier-Portal, Verlag: Elsevier, München (2009), ISBN-13: 978-3437582509 A

Electronic sources:

information and material for the course will be available at StudIP:

<https://studip.uni-giessen.de/studip/>

Learning recommendations:

a preparation of the topics before the respective seminar

Assessment:

a final exam at the end of the semester, an oral and a practical examination within the framework of the Veterinary Medical Examination in "General and Specific Pathology, Pathological Anatomy and Histology" in the eleventh semester



ANIMAL WELFARE AND ETHOLOGY II

Coordinator:
Würbel

Instructors:
Würbel, Kuhne

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:
an overview of the natural behaviour and the most important problems concerning the behaviour and protection of the most important livestock, pets and laboratory animals.

Overall aims and objectives:

Students should be able to:

- explain the natural behaviour of the most important livestock, pets and laboratory animals on the basis of the principles of behavioural ecology,
- deduce the requirements of most important livestock, pets and laboratory animals concerning their keeping from their natural behaviour,
- assess whether the commonly used methods of keeping of the most important livestock, pets and laboratory animals are appropriate with regard to their behaviour,
- describe the most important problems concerning the behaviour and protection of the most important livestock, pets and laboratory animals which result from a conventional treatment, and assess – on the basis of the animal protection act – their relevance for animal protection

Reading list:

Sambraus HH, Steiger A, Das Buch vom Tierschutz, Verlag: Enke (1997), ISBN-13: 978-3432294315

Jensen P, The Ethology of Domestic Animals – An Introductory Text, CABI Publishing, Wallingford The Ethology of Domestic Animals, 2nd Edition: An Introductory text ISBN-13: 9781845935368

Scripts:

PowerPoint presentation available for download at the homepage of the Institute of Animal Protection and Ethology

www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/klinikum/tierschutz/lehre/veranstaltungen/vorlesungen

<https://studip.uni-giessen.de/studip/>

Assessment:

a written examination within the framework of the Veterinary Medical Examination in “Animal Welfare and Ethology” after the seventh semester



MILK HYGIENE II

Coordinator:
Usleber

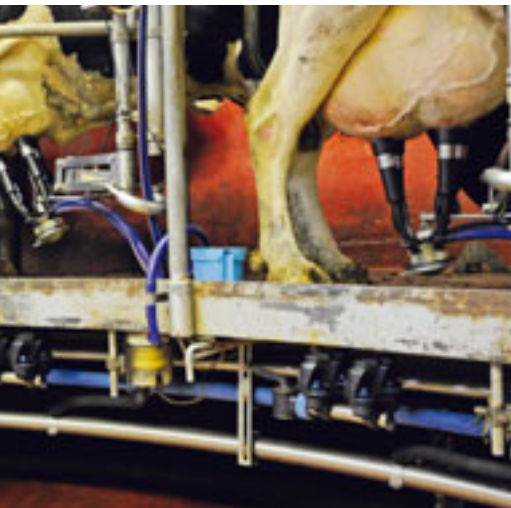
Instructors:
Usleber, Ackermann, Large, Wescher

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

The hygiene of milk production, in particular milking technology and milking hygiene, industrial hygiene; milk quality regulations; the transport of delivered milk; the production of drinking milk and dairy products (fermented milk products, dry milk products, cheese, butter, mixed milk products); the microbiology of milk and dairy products, in particular starter cultures; probiotics; spoilage organisms; milk hygiene regulations.



Overall aims and objectives:

Students should be able to:

- explain the relevance of the factors describing the quality and hygienic valence of milk during the primary production, as well as measures that guarantee the quality of dairy products and exclude any health hazards for human consumption, and assess the respective factors that have an influence on this,
- explain the microbiological correlations that are important for milk and dairy products and define micro-organisms that can be found in milk with regard to their occurrence, relevance and detection,
- explain the production of the most important dairy products and assess them with regard to aspects of hygiene and nutrition,
- explain the basic principles that underlie the respective legal regulations concerning the above mentioned aspects.

Electronic sources:

presentations of the content of the course are available as .pdf-files at StudIP <https://studip.uni-giessen.de/studip/>

Assessment:

a written examination within the framework of the Veterinary Medical Examination in “Dairy science” after the eighth semester

COURSE IN MILK ANALYSIS

Coordinator:
Usleber

Instructors:
Usleber, Ackermann, Large, Wescher

Course type:
seminar with practicals (1 CHW)

ECTS:
2

Introduction:

A discussion of concrete aspects of milk hygiene and demonstrations respectively the carrying out of practical exercises under supervision. The taking of milk samples, cell count, bacteriological analysis of milking samples of each udder quarter, inhibitor test, physical quality parameters, verification of pasteurization, casein precipitation, starter cultures, methods of a colony count in milk, detection of pathogens in milk and dairy products.

Overall aims and objectives:

Students should be able to:

- describe the method of analysis for raw milk within the framework of the milk quality examination and explain reasons for a deviation from standard values,
- explain factors that affect the taking of samples as well as cytological and bacteriological findings in connection with sub-clinical mastitis, and further, explain the characteristics of important pathogens with regard to industrial hygiene,
- describe methods for determining the physical-chemical quality parameters of milk and dairy products and interpret the findings with regard to set values,



- describe the methods and principles of producing dairy products and name causes that can lead to problems in milk processing,
- recognize important tools for the microbiological analysis of dairy products and interpret typical findings in context

Electronic sources:

the complete presentations of the content of the course are available as .pdf-files at StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

A written examination within the framework of the Veterinary Medical Examination in “Diary science” after the eighth semester

PATHOLOGICAL- ANATOMICAL DEMONSTRATIONS

Coordinator:

Reinacher

Instructors:

Henrich, Herden, Huisinga, Köhler,
Reinacher

Type of course:

practical and seminar each lasting one hour (1 contact hour per week, every two weeks for two hours, in 2 alternating groups/over the period of 2 semesters)

ECTS:

1,5

Requirements:

Students must have attended the lecture on “General pathology” and the seminar on “General pathology”

Introduction:

The participants of the course will work with material taken from routine necropsies of the Institute, archived material and material of slaughtered animals. The abnormalities of organs will be discussed in groups with an assistant. The pathological-anatomical and differential diagnoses will be collected and discussed. Each case will be discussed epicritically, referring to its possible etiologies, pathogenesis and clinical relevance.

Overall aims and objectives:

Students should be able to:

- produce a forensically applicable organ report. This will include a complete description of the abnormalities of the organs, the formulation of the pathological-anatomical diagnoses, the differential diagnoses and the epicrisis.

Reading list:

Dahme/Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke; 6. völlig neu bearb. Auflage (2007), ISBN-13: 978-3830410485

McGavin/Zachary: Pathologic Basis of Veterinary Disease, Verlag: Mosby; 4th ed. (2006), ISBN-13: 978-0323028707

respectively the translated version: Pathologie der Haustiere: Allgemeine, spezielle und funktionelle Veterinärpathologie- mit Zugang zum Elsevier-Portal, Verlag: Elsevier, München (2009), ISBN-13: 978-3437582509 A

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

final discussion/attestation at the end of the eighth semester; an oral and a practical examination within the framework of the Veterinary Medical Examination in “General pathology and Special pathological anatomy and histology in the eleventh semester

FORENSIC VETERINARY MEDICINE, PROFESSIONAL AND ETHICAL LAW

Coordinator:
Fey

Instructors:
Fey, Roscher

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:

- knowledge of the law of obligation and its impact on purchase law
- requirements of due diligence of the veterinarian
- issues of liability that are important for the veterinary practice
- criminal aspects that may be of importance for the veterinary practice

Overall aims and objectives:

Students should be able to:

- apply their knowledge of those articles that regulate the law of obligation, in particular its impact on purchase law,
- list the general and specific requirements of due diligence of the veterinarian and describe the consequences in the case of a breach of these requirements,
- enumerate issues of liability that are important for the veterinary practice and know ways to financially safeguard themselves against possible risks
- explain aspects of penal law that may be of importance for the veterinary practice

Reading list:

Althaus J., Ries, H.P., Schnieder K.-H., Großbölting, R. (Hrsg.): Praxishandbuch Tierarztrecht. Schlütersche Verlagsgesellschaft 2006, 1. Auflage (2006), ISBN-13: 978-3899930207

Brennecke D., Münow, F.: Existenzgründung kompakt. Veterinärspiegel Verlag 2008, ISBN: 978-3-86542-012-1

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

a written examination (MCQ) within the framework of the Veterinary Medical Examination in "Forensic Veterinary Medicine, professional and ethical law" after the eighth semester



RADIOLOGY

Coordinator:
Kramer

Instructors:
Bülte, Kramer, Müller, Wigger

Course type:
lecture (2 CHW)

ECTS:
2

Introduction:
The course will cover the following fundamental issues:

1. the properties and effects of ionising radiation,
2. the fundamentals of radiation biology,
3. the effects of ionising radiation on humans, animals, foodstuff, animal feed and the environment,
4. methods for the detection of the effects of radiation, and to determine the amount of radiation that employees and the animal owners may receive,
5. methods for the detection of a contamination with radioactive substances,
6. the physical-technical principles and principles of application of diagnostic imaging methods, including the alternatives to the application of ionising radiation,
7. the fundamental principles of radiation therapy,
8. the statutory, practical and technical radiation protection of employees and animals owners (the examination will cover: numbers 4-8 of the basic course in radiation protection, according to the Appendix 1 of the directive "Radiation Protection in Veterinary Medicine"; GMBI 2005 p. 666)
9. radiographic technology, the biologic

effect of radiation, ultrasonic technology, computer tomography, magnetic resonance imaging, scintigraphy, PET/SPECT, food radiology

Overall aims and objectives:
Students should be able to name and explain the following aspects:

- the fundamental principles of the properties and effects of ionising radiation,
- the fundamental principles of radiation biology,
- the effects of ionising radiation on humans, animals, foodstuff, animal feed and the environment,
- methods for the detection of the effects of radiation, and to determine the amount of radiation that employees and animal owners may receive,
- methods for the detection of a contamination with radioactive substances,
- the physical-technical principles and principles of application of diagnostic imaging methods, including the alternatives to the application of ionising radiation,
- the fundamental principles of radiation therapy,
- the statutory, practical and technical radiation protection of employees and carers of animals (the examination will cover: numbers 4-8 of the basic course in radiation protection, according to the Appendix 1 of the directive "Radiation Protection in Veterinary Medicine"; GMBI 2005 p. 666)

Reading list:
see StudIP:
<https://studip.uni-giessen.de/studip/>
Here, the appropriate and relevant legal texts and documents can be found

Electronic sources:
lectures are available at StudIP

Learning recommendations:

the respective legislation, lectures available at StudIP

Assessment:

According to § 43 of the TAppV:

- (2) Recognition of the successfully completed examination (according to paragraph 1) as basic course in radiation protection according to Appendix 1 of the directive “Radiation Protection in Veterinary Medicine”, if the respective authority has previously determined that the requirements (the content of Appendix 1 of the directive “Radiation Protection in Veterinary Medicine”) have been met.
- (3) Students can only begin the acquisition of expertise required in the field of diagnostic radiology once they have successfully passed the examination in the examination subject “Radiology” during their clinical training. The content is based on the guidelines of the directive “Radiation Protection in Veterinary Medicine”.

A written examination within the framework of the Veterinary Medical Examination in “Radiology” after the seventh semester





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8TH SEMESTER

Blocks	WEEKS	ECTS
Urinary Tract	3	3
Endocrinology	1	1
Laboratory Animals And Small Mammalian Patients	1	1
Reproduction	7	7
Livestock management	2	2
Regular Courses	CHW	ECTS
Forensic Veterinary Medicine, Professional and ethical law L	1	1
Functional Pathology S	0,5	1
Poultry Diseases L	1	1
Fish Diseases and Reptiles L	1	1
Histopathology P	2	3
Food Science L	4	4
Food examination P	2	3
Pathological-anatomical Demonstrations P	1	1,5
Combating Epizootic Diseases L	3	3
Elective Courses		
Examinations		
Pharmacology and Toxicology		1
Dairy science		2
Combating Epizootic Diseases and Infectious Disease Epidemiology		2
Forensic Veterinary Medicine, Professional and ethical law		2
Partial Exam MCQ Internal Medicine (20% Veterinary Medical Examination)		0,5
Partial Exam MCQ Surgery and Anaesthesiology (20% Veterinary Medical Examination)		0,5
Partial Exam MCQ Reproductive Medicine (20% Veterinary Medical Examination)		0,5

L= lecture, P= practical, S=seminar

CHW = contact hour per week (Semesterwochenstunde)

ECTS = European Credit Transfer and Accumulation System, Indication of Credit Points

Duration of block courses is given in "h =hours", 1h =45 min

Please note: further information regarding courses can be found at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium>

URINARY TRACT

Summary:

Along with polyuria with a resulting polydipsia, it is primarily a urinary incontinence, a urinary obstruction or a change in urinary colour which indicates a disease of the urinary tract. For this reason it is very important being able to carry out and interpret the complete urinalysis. Imaging techniques are the other important methods to diagnose diseases of the urinary tract.

Further details (e.g. reading list) on the individual courses can be found online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Urinalysis L (1h)

Students should be able to:

- explain the most important steps of the urinalysis (macroscopic, specific gravity, dipstick, sediment) and the respective findings,
- interpret possible findings of the most important tests (macroscopic, dipstick, sediment),
- define and interpret the terms “isosthenuria”, “hyposthenuria”, “hypersthenuria”,
- assess the main components of the sediment (cells, crystals, cylinder, microorganisms) and interpret their clinical relevance.

Imaging kidney L (2h)

Students should be able to:

- assess with radiographic means the position, size and shape of the kidneys in dogs and cats,
- identify essential pathological alterations.

Acute renal insufficiency L (1h)

Students should be able to:

- distinguish between acute and chronic renal insufficiency,
- list the most common causes of an acute renal failure,
- recognize and interpret the problems of an acute renal failure (electrolyte imbalance, acid-base- shift, oliguria),
- discuss therapeutic methods in a case of oliguric renal insufficiency.

Fluid therapy L (1h)

Students should be able to:

- quantify dehydration and arrange a fluid therapy for one patient,
- depending on the indication, choose between the different infusion solutions and calculate the amounts required.

Chronic renal insufficiency L (2h)

Students should be able to:

- discuss the symptoms of a chronic renal failure (CRF),
- recognize the laboratory alterations (blood, urine) in a case of CRF,
- differentiate between acute and CRF,
- explain therapeutic strategies to treat CRF

Imaging lower urinary tract L (2h)

Students should be able to:

- explain the methods of intravenous excretory urography and retrograde urethro-cystography.
- interpret normal variations of the bladder in dogs and cats,

8TH SEMESTER

- assess important pathological alterations.

Electrolytes L (1h)

Students should be able to:

- deduce the most important differential diagnoses of mechanisms of hyper/hypo-natraemia, -chloraemia, -phosphataemia and -magnesaemia,
- interpret the findings of patients suffering from electrolyte disorders.

Urinary stones – dog L (1h)

Students should be able to:

- discuss the pathophysiology of the development of urinary stones,
- describe the epidemiology of the most important urinary stones,
- apply therapeutic and prophylactic measures for the individual stones.

Acid-base balance L (1h)

Students should be able to:

- define and interpret the terms “acidaemia”, “acidosis” “alkaliaemie”,

“alkalosis”; “hypoxaemia” “hypoxia”, “hypercapnia” and “hypocapnia”,

- list and explain the most important regulatory mechanisms of the acid-base balance,
- explain the requirements for a blood gas analysis (sample material, equipment),
- interpret patient findings with the help of $[\text{HCO}_3^-]$ pH-value and CO_2 partial pressure and explain which type of deviation from the acid-base balance is the case (respiratory/metabolic acidosis or alkalosis) and whether the patient shows signs of compensation,
- list and explain possible differential diagnoses for respiratory/metabolic acidosis or alkalosis.

FLUTD – surgery L (1h)

Students should be able to:

- point out the fundamentals of feline lower urinary tract disease (FLUTD),
- compile a treatment plan for FLUTD.



FLUTD – internal medicine L (1h)

Students should be able to:

- discuss the causes of a feline lower urinary tract disease (FLUTD),
- describe the patho-physiological mechanisms of idiopathic FLUTD,
- correctly treat cats with FLUTD,
- explain therapeutic measures for idiopathic FLUTD.

Urinary surgery L (2h)

Students should be able to:

- list and define the different surgical diseases of the urinary tract of small animals,
- give the indications for surgical intervention in diseases of the urinary tract.

Surgery urinary tract prostate L (2h)

Students should be able to:

- name surgical diseases of the urinary tract and the prostate and explain their etiology and diagnostics,
- explain and discuss possibilities of surgical intervention in diseases of the prostate.

Incontinence – small animals L (1h)

Students should be able to:

- explain the innervation of the urinary tract (repetition anatomy),
- describe and correctly diagnose causes of urinary incontinence,
- explain imaging methods for the diagnosis of urinary incontinence,
- discuss pharmacological therapeutic methods for urinary incontinence.

Clinic for Horses

(Internal Medicine and Surgery)

(Fey, Litzke et al.)

Diseases of the equine urinary tract – clinical and further diagnostics L (1h)

Students should be able to:

- list possibilities of the diagnostics for diseases of the equine urinary organs,
- define and explain the most important physiological and patho-physiological mechanisms of the function of the urinary organs.

Equine urinary diseases – renal diseases L (1h)

Students should be able to:

- define the most important etiological causes of a renal disease in horses,
- name and apply the fundamentals of the therapy of equine renal diseases.

Equine urinary diseases – diseases of the bladder and urinary tract L (1h)

Students should be able to:

- define the most important etiological causes of a disease of the bladder and the urinary tract in horses,
- name and apply the fundamentals of the therapy of the bladder and the urinary tract in horses.



**Clinic for Farm Animals
(Internal Medicine and Surgery)
(Doll, Reiner et al.)**

**Diseases of the urinary tract –
ruminants: general L (2h)**

Students should be able to:

- name the different indications for a urinalysis in ruminants, carry out a urinary sampling and an examination of ruminants,
- explain specific clinical and laboratory-diagnostic findings in the case of diseases of the urinary organ.

**Diseases of the urinary tract –
ruminants: obstruction of the urinary
tract L (2h)**

Students should be able to:

- explain the causes and symptoms of an obstruction of the urinary tract in cattle and small ruminants, as well as
- point out concrete measures for their

treatment and prophylaxis,

- list the causes, symptoms and treatment of diseases of the urinary bladder – such as bladder paralysis, injuries, bladder inflammation and tumours – in cattle.

Kidney – ruminants L (1h)

Students should be able to:

- explain the causes and symptoms, as well as the prognosis and treatment of the following
- diseases of the kidney:
- chromo-proteinamic nephroses
- amyloidnephrosis
- nephritis
- pyelonephritis

Diseases of the urinary tract – calf L (1h)

Students should be able to:

- explain the causes and symptoms, as well as the prognosis and treatment of the following

- diseases:
- omphalourachitis
- cystitis
- injury and obstruction of the urethra
- nephritis

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Diuretics, anti-diuretics L (2h)

Students should be able to:

- reflect critically on the differences in effect of diuretics,
- derive reasons for the selection of diuretics in emergency application for life-threatening oedema,
- classify individual diuretics according to their fields application,
- assess osmодиuretics and poisonings,
- weigh necessary applications and contraindications (dehydration, potassium loss, etc.).

Institute of Veterinary Pathology (Reinacher, Herden, et al.)

Pathology urinary tract L (4h)

Students should be able to:

- identify the pathological processes and conditions of domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in context to the clinical image,
- explain the etiology and pathogenesis of the alterations as well as make the correct morphological diagnoses and discuss differential diagnoses.

A detailed list of topics is available on StudIP:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical Demonstrations S (6h)

The content of the clinical demonstrations will refer to the patients currently treated at the clinic and can therefore not be given beforehand.

Radiography, urine, blood (Comprehensive Course) (3h)

Students should be able to:

- carry out the preparation and microscopic examination of specimens of urine sediment,
- list and assess the main components of urine sediment (cells, cylinders, crystals),
- list the special features of the urine of different species (horses, dogs, cats),
- carry out and evaluate a measurement of specific gravity (iso-, hypo-, hyperthenuria),
- interpret clinical, laboratory-diagnostic and radiological patient findings and deduce possible differential diagnoses.

Bacteriology urinary tract (Comprehensive Course) (1h)

Students should be able to:

- discuss the epidemiology of infections of the urinary tract,
- explain defence mechanisms of the body to fight infections of the urinary tract,
- explain the most common germs and strategies to combat those.

Physiology kidney (Comprehensive Course) (1h)

Students should be able to:

- explain the water balance and electrolytic secretion of the kidney,
- describe the influence of the kidney on the acid-base metabolism,
- define renal hormone synthesis and describe its influence on other organ systems.

ENDOCRINOLOGY

Summary:

Endocrine disorders, which mainly occur in small animals, are of particular relevance. The most important representatives of these problems are diseases of the thyroid gland, adrenal gland, endocrine pancreas and pituitary gland. Most cases respond well to therapy and a good outcome is common. Knowledge of regulatory pathways of hormone systems is essential to understand the various diagnostic tests employed (stimulatory and suppression tests)

Further details (e.g. reading list) on the individual courses can be found online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

**Clinic for Small Animals
(Internal Medicine and Surgery)
(Kramer, Moritz, Neiger et al.)**

Polyuria / polydipsia L (1h)

Students should be able to:

- discuss the physiology of the body's water metabolism,
- list differential diagnoses and their patho-physiologic mechanisms of PU/PD,
- explain diagnostic steps for the treatment of animals suffering from PU/PD.

Hypothyroidism L (1h)

Students should be able to:

- discuss the physiology of the production of thyroid hormones,
- explain the causes of a hypothyroidism in dogs,
- discuss the epidemiology, clinic and complications of hypothyroidism in dogs,
- carry out diagnostic tests and interpret the results correctly,
- explain the treatment of hypothyroidism.

Hyperthyroidism L (1h)

Students should be able to:

- discuss the physiology of the production of thyroid hormones,
- recognize the causes of feline hyperthyroidism, its complications and clinic,
- induce diagnostic measures and correctly interpret their results,
- list possible therapeutic measures and their advantages and disadvantages.

Hyperadrenocorticism L (1h)

Students should be able to:

- discuss the pathogenesis and pathophysiology of the production of steroid hormones and their potential dysregulation,
- discuss the epidemiology, clinic and complications of canine (and feline) hyperadrenocorticism,
- induce appropriate diagnostic measures and correctly interpret the results in connection with the clinic,
- list possible therapeutic measures for hyperadrenocorticism and monitor them

Hypoadrenocorticism L (1h)

Students should be able to:

- discuss the pathogenesis and pathophysiology of the production of steroid hormones and their potential dysregulation,
- discuss the epidemiology, clinic and complications of canine hypoadrenocorticism,
- list possible causes of hypoadrenocorticism and induce the necessary steps to arrive at a diagnosis.
- discuss the correct treatment during a hypoadrenergic crisis as well as with regard to the long-term consequences.

Diabetes mellitus – dog L (1h)

Students should be able to:

- explain the patho-physiology of the glucose metabolism for the different types of diabetes,
- discuss the clinic and potential complications,
- explain all the diagnostic tests that are necessary for diabetic patients,
- explain how to correctly treat a dog suffering from diabetes mellitus (insulin, diet).

Diabetes mellitus – cat L (1h)

Students should be able to:

- explain the patho-physiology of the glucose metabolism for the different types of diabetes,
- discuss the clinic and potential complications,
- explain all the diagnostic tests that are necessary for diabetic patients,
- explain how to correctly treat a cat suffering from diabetes mellitus (insulin, diet).

Diabetic ketoacidosis – small animals L (1h)

Students should be able to:

- discuss the pathogenesis and pathophysiology of ketoacidosis,
- arrive at a diagnosis of ketoacidosis,
- recognize and list complications,
- discuss how to stabilize and treat an animal suffering from diabetic ketoacidosis to enable a subsequent treatment as a case of normal, uncomplicated diabetes.



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Hypercalcaemia L (1h)

Students should be able to:

- explain the patho-physiology of the calcium metabolism,
- list causes of a hypercalcaemia,
- take the correct diagnostic steps in the case of increased calcium levels,
- discuss the epidemiology, clinic and diagnosis for hyperparathyroidism,
- provide adequate and permanent treatment for increased levels of calcium.

Rare endocrinopathies L (1h)

Students should be able to:

- discuss the epidemiology, diagnosis and treatment of insulinoma,
- discuss the epidemiology, diagnosis and treatment of further adrenal diseases (hyperaldosteronism, pheochromocytom),
- describe the hypo- and hyper-production of growth hormones,
- list other types of endocrinopathies.



Surgery Endocrinology L (1h)

Students should be able to:

- assess surgical diseases of the adrenal gland, pancreas, and the thyroid gland and create a therapeutic plan,
- discuss and define the surgical fundamental principles of adrenal surgery,
- discuss the surgical fundamental principles of thyroid surgery,
- deduce the underlying diseases of the adrenal glands and thyroideae.

Clinic for Horses (Internal Medicine and Surgery) (Fey, Litzke et al.)

Equine Cushing Syndrome (ECS) L (1h)

Students should be able to:

- give the cause of the ECS,
- explain the patho-physiological correlations and special characteristics of the ECS as compared to dogs and humans,
- list typical clinical and laboratory-diagnostic findings,
- name and assess laboratory-diagnostic tests,
- explain therapeutic approaches.

Equine Metabolic Syndrome (EMS) L (1h)

Students should be able to:

- comment on diseases of the equine thyroid,
- explain the difference between obesity and EMS requiring therapy,
- name diagnostic tests to determine a resistance to insulin,
- explain methods of management, feeding, and possible medication for EMS patients.

Clinic for Farm Animals (Internal Medicine and Surgery) (Doll, Reiner et al.)

Bovine ketosis L (1h)

Students should be able to:

- explain the relevance of this metabolic disorder for modern dairy farming,
- name and assess the factors which encourage a development of ketoses,
- list the methods that can be used to diagnose metabolic disorders,
- point out appropriate measures of treatment and prophylaxis.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Pharmacology diabetes mellitus L (2h)

Students should be able to:

- explain the metabolisms of carbohydrate and aliphatic acid, including dysfunctions in the case of insulin insufficiency diabetes (type 1) and disrupted insulin secretion with insulin resistance (type 2),
- explain the regulation of insulin secretion and the effects of insulin on tissue that is sensitive to insulin (muscle, liver, fat),
- give the classification and relevance of diabetes, including the different etiologies of type 1 and type 2,
- assess various possibilities for therapeutic intervention using insulin and oral anti-diabetics,
- explain the varying duration of the effects of insulin, (ultra) rapid-acting insulin analogues, insulin formulations, and long-acting insulin analogues (basal-insulin), including possible unwanted effects and emergency measures in the case of hypoglycaemia.

Institute of Veterinary Pathology (Reinacher, Herden, et al.)

Endocrine pathology L (2h)

Students should be able to:

- identify pathological processes and conditions of domestic animals,
- explain the entities that concern individual organ systems,
- define and classify the diseases and explain them comprehensively in context to the clinical image,
- explain the etiology and pathogenesis of the alterations as well as make the correct morphological diagnoses and discuss differential diagnoses.

A detailed list of topics is available on StudIP:

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Miscellaneous

Clinical Demonstrations

The content of the clinical demonstrations will refer to the patients currently treated at the clinic and can therefore not be given beforehand.

Refresher course in physiology of hormones (Comprehensive Course) (1h)

Students should be able to:

- discuss the normal control circuits of hormone regulation,
- describe influences on hormone production,
- describe important laboratory-diagnostic procedures.

LABORATORY AND SMALL MAMMALIAN PATIENTS

Summary:

Laboratory animals (rodents, lagomorphs, guinea pigs) are commonly used in research. These animals require special attention concerning their keeping and have to be treated in a special manner – in accordance with the animal protection act – also to ensure the conclusiveness of experiments. Usually, examination methods for laboratory animals differ from those used for other animal species. These differences, as well as frequent problems in the keeping of laboratory animals will be discussed. This block will furthermore thoroughly deal with small mammalian patients, an increasingly relevant part of the small animal practice.

Further details (e.g. reading list) on the individual courses can be found online at:

<http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

Clinic for Small Animals (Internal Medicine-Small Mammalian Patients) (Goebbel)

Fractures in small mammals – causes and diagnostics L (1h)

Students should be able to:

- enumerate the causes of fractures of the limbs in small mammal patients,
- specify the essential requirements for the obtaining of radiographic images for precise diagnostics with regard to the regulations for radiation protection,
- assess radiographic images,
- point out possibilities of conservative and surgical treatments of limb fractures.

Surgical treatment of fractures in small mammals L (1h)

Students should be able to:

- point out problems that may arise in the surgical treatment of front- or hind-limbs (especially the tibia fracture),
- explain how these can be prevented respectively treated,
- explain the indications for surgical treatment,
- discuss the administration of analgesics and antibiotics following surgical care.

Infectious diseases in ferrets L (1h)

Students should be able to:

- list the numerous known viral and bacterial diseases in ferrets,
- discuss the symptoms, the diagnosis and possible treatment measures.

Encephalitozoon cuniculi disease in pet rabbits L (1h)

Students should be able to:

- describe the pathogen encephalitozoon cuniculi,
- explain the transmission, pathogenesis and symptoms in pet rabbits,
- give differential diagnoses,
- explain the consequential damages of the kidneys and eyes.

Diabetes mellitus in small mammals L (1h)

Students should be able to:

- explain the etiology, typical symptoms, diagnosis and treatment of the disease,
- describe the differences in treatment according to the different species.

Endocrine disorders in small mammals L (1h)

Students should be able to:

- explain the etiology, symptoms, diagnosis, and forms of treatment, as well as the prognosis for the insulinoma in ferrets,
- describe the cause, symptoms, diagnosis, treatment, and in particular, the effect of the drug
- leuprolidacetat in cases of hyperadrenocorticism in ferrets,
- explain the symptoms and the treatment of hyperoestrogenism in ferrets,
- name the symptoms, diagnosis and treatment of ovarian cysts in guinea pigs,
- name thyroid diseases in the small mammalian patient.

Clinical examination and diagnostics of diseases in small mammalian patients L (1h)

Students should be able to:

- ask most important questions during history taking,
- describe the particularities of the clinical examination,
- give special methods how to palpate and auscultate small mammals,
- prove the importance of radiographic examinations by illustrating the differences in species and parts of the body,
- assess the importance of ultrasound, whereupon the topography of organs is repeated, in the individual body cavities,
- describe the application of the ECG for small mammal patients.

Intensive care of small mammals L (1h)

Students should be able to:

- explain the anatomy of the veins with regard to the administration of fluids, taking into account the differences of the various species, and the intraperitoneal and intraosseous administration of fluids,

- calculate amounts and dosages for the administration of fluid,
- discuss the advantages and disadvantages of manual force-feeding and force-feeding via the feeding tube,
- name preparations for the force-feeding of different species,
- recognize pain and point out the common drugs used for pain therapy,
- explain problems in the administration of antibiotics for small mammals, including the advantages and disadvantages of the different antibiotics.

Anaesthesia for small mammals L (1h)

Students should be able to:

- explain the surgical preparation, injective anaesthesia, inhalative anaesthesia, intubation, and the monitoring of anaesthesia,
- assess the importance of the general examination, the period of feeding restrictions, the pre-medication and the shock prophylaxis and analgesia,
- present a simple sedation,
- explain the advantages and disadvantages of injective anaesthesia, while taking into account the different types of injective methods,
- present the injective narcotics and their antagonists,
- discuss the fields of application as well as the advantages and disadvantages of mere inhalative anaesthesia,
- describe the technical equipment necessary for mere inhalative anaesthesia and carry out the inhalative anaesthesia,
- explain the monitoring of anaesthesia, the surgical preparation as well as the post-surgical care.

Institute of Veterinary Physiology (Schultheiß)

Introduction to laboratory animal science L (1h)

Students should be able to:

- understand the importance of laboratory animal science and classify the subject according to the complex of veterinary medicine.

Ethical principles and the 3R's according to Russell and Burch in laboratory animal science L (1h)

Students should be able to:

- evaluate animal testing ethically and understand the system of the 3R's established by Russell and Burch.

Conventional ways of keeping within systems of keeping laboratory animals L (1h)

Students should be able to:

- identify the components of the conventional systems and understand their relevance for scientific research,
- categorize the systems according to the different barrier levels.

Barrier systems in the keeping of laboratory animals L (1h)

Students should be able to:

- describe the components of IVC systems and isolators,
- explain the relevance of the modern systems for rodents and list their advantages and disadvantages as compared to conventional systems.

The laboratory rat: origin and veterinary principles L (1h)

Students should be able to:

- discuss anatomical similarities,
- and differences as compared to humans and other laboratory animals

from the perspective of laboratory animal science,

- explain the physiological fundamental principles and classify the behavioural patterns of laboratory rats.

The laboratory rat: diagnostics and therapeutic measures L (1h)

Students should be able to:

- name and recognize the most important infectious diseases of laboratory rats,
- explain post-infective therapeutic measures from the perspective of laboratory animal science.

The laboratory mouse: origin and veterinary principles L (1h)

Students should be able to:

- discuss anatomical similarities and differences as compared to humans from the perspective of laboratory animal science,
- explain the physiological fundamental principles and classify the behavioural patterns of laboratory mice.
- explain the different breeding methods and manipulations in order to achieve
- genetically modified mice.

The laboratory mouse: diagnostics and therapeutic measures L (1h)

Students should be able to:

- name and recognize the most important infectious diseases of laboratory mice,
- explain post-infective therapeutic measures from the perspective of laboratory animal science.
- explain the different breeding methods and manipulations in order to achieve
- genetically modified mice.

Sheep as laboratory animals L (1h)

Students should be able to:

- explain the anatomical and physiological features of sheep from the perspective of laboratory animal science,
- explain the differences of the systems of keeping sheep in laboratory animal facilities,
- name and classify the fields of application of sheep in animal testing,
- name the most important infectious diseases of sheep.

Pigs as experimental animals: basic principles L (1h)

Students should be able to:



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- explain the anatomical and physiological features of pigs and mini-pigs from the perspective of laboratory animal science,
- explain the differences of the systems of keeping pigs in laboratory animal facilities,
- explain the differences of pigs and mini-pigs.

Mini-pigs and pigs as laboratory animals: infections and purpose in animal testing L (1h)

Students should be able to:

- name and classify the fields of application of mini-pigs in animal testing,
- name the most important infectious diseases of mini pigs,
- recognize pathological alterations in mini-pigs.

The German animal protection legislation and ethical considerations L (1h)

Students should be able to:

- reflect on the legal principles and integration of the animal protection legislation on a national and international level.

German animal protection legislation and its practical application when applying for licences for animal testing L (1h)

Students should be able to:

- point out the statutory regulations concerning animal testing and the use of animals in teaching,
- apply the statutory principles using administrative regulations.

Applying formally correct for a licence for animal testing on a national level L (1h)

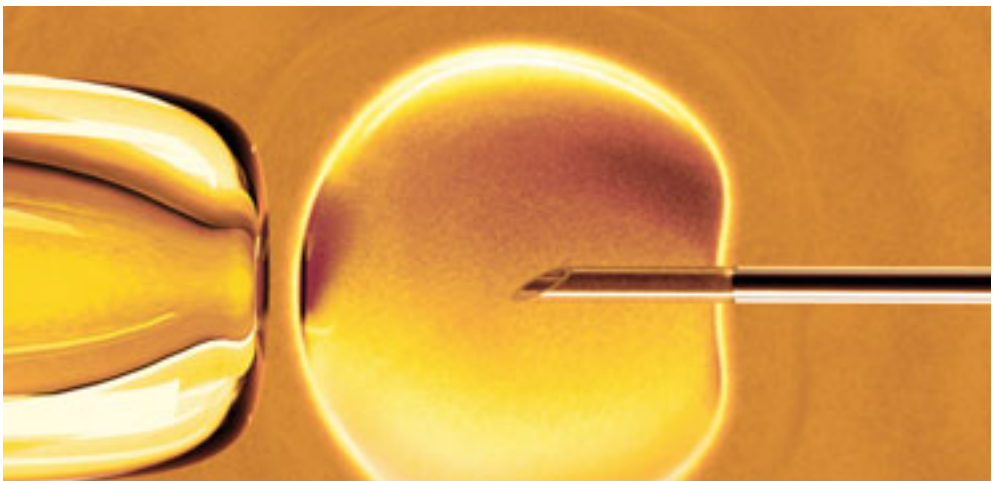
Students should be able to:

- understand the ethical justification and produce such an ethical justification in accordance with the animal protection legislation.

Miscellaneous

Clinical Demonstrations S (2h)

The content of the clinical demonstrations will refer to the patients currently treated at the clinic and can therefore not be given beforehand.



REPRODUCTION

Summary:

This block will deal with the physiology and pathology of the reproductive organs, the mammary gland and the reproductive function, as well as with biotechnological procedures used for domestic mammals. The focus will be on the species cat, dog, pig, sheep, goat, cow and horse. Furthermore, those domestic animals and small mammals that are most common in Germany will be discussed.

Further details (e.g. reading list) on the individual courses can be found online at: <http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

Clinic for Reproduction (Wehrend et al.)

Female reproductive organs L (1h)

Students should be able to:

- explain the function and anatomy of the female sexual organs from a clinical perspective.

Sex determination L (1h)

Students should be able to:

- list the factors of the determination of the sex of domestic mammals and point out their properties and functions (as far as known),
- explain the procedure of male and female sex determination,
- explain the concept of basic femaleness,
- explain the conversion of indifferent predispositions into the respective dimorphic organs or structures existent in the male or female sex,
- give an outline of the mechanisms of sex determination of birds, reptiles and fish,

- list important disruptions of sex determination of domestic mammals and explain their causes.

Female endocrine regulatory circuits L (1h)

Students should be able to:

- explain the basic principles of hormonal effects,
- describe the structure of the regulatory circuit that controls the female sexual functions and the components and factors involved,
- explain the structure of the following hormones and list their properties and most important effects concerning the regulation of the ovarian cycle: GnRH, FSH, LH, Inhibin, Estradiol-17 β , progesterone, PGF2 α , melatonin,
- explain the biosynthesis of sexual steroids.

Cycle – horses L (1h)

Students should be able to:

- describe the cycle of the mare and its regulation, as well as explain possible methods of the diagnostics of the cycle.

Cycle – dog L (1h)

Students should be able to:

- describe the cycle of the bitch and its regulation, as well as explain possible methods of the diagnostics of the cycle.

Cycle – cat L (1h)

Students should be able to:

- describe the cycle of the cat and its regulation, as well as explain possible methods of the diagnostics of the cycle.

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Cycle – swine L (1h)

Students should be able to:

- describe the cycle of the sow and its regulation, as well as explain possible methods of the diagnostics of the cycle.

Cycle – ruminants L (1h)

Students should be able to:

- describe the cycle of the cow, sheep and goat and its regulation, as well as explain possible methods of the diagnostics of the cycle.

Application of hormones – cattle/pigs L (3h)

Students should be able to:

- explain, respectively list, the structure and effects (and, where applicable, the unwanted side-effects) of the following hormones (and, where applicable, their synthetic analogues): GnRH, LH, FSH, hCG, eCG, progesterone, estrogens, PGF2 α ,
- list the fields of application of the hormones mentioned above, respectively active substances with regard to the treatment of fertility disorders in female cattle and pigs,
- discuss the methods and limitations of conventional hormonal treatments of reproductive disorders in cattle and pigs.

Biotechnology female 1+2 L (2h)

Students should be able to:

- explain the basic principles of the biotechnologies mentioned above, as well as discuss the advantages and disadvantages and possible problems of these procedures,
- discuss the possibilities, limitations and risks of modern biotechnologies.

Male endocrine regulatory circuit L (1h)

Students should be able to:

- explain the structure of the regulatory circuit that controls the sexual functions of male domestic mammals,
- list the effects of the hormones involved in the regulatory circuit of male domestic mammals,
- explain the changes in the area of the regulatory circuit during puberty,
- explain seasonal influences on the endocrine system of male mammals.

Application of hormones – horses L (1h)

Students should be able to:

- describe the characteristics of the cyclic regulation of the mare and its impact on the possibilities of manipulation by means of hormone administrations,
- explain the basic principles of the aforementioned applications of hormones in mares and list their indications,
- discuss the relevance, possibilities and risks of the aforementioned therapeutic measures.

Application of hormones – small animals L (1h)

Students should be able to:

- describe the active substances and compounds commonly used in Germany for the treatment of dogs and cats and explain their field of indication and their unwanted side-effects.

Oogenesis and folliculogenesis L (1h)

Students should be able to:

- explain, respectively define, the following terms: oogenesis, folliculogenesis, primordial-/ primary/ secondary/ tertiary-/ Graaf's follicle, recruitment, selection, dominance, ovulation, luteinisation, granulosa cells, pellucid zone, theca, Hohlweg-effect,
- illustrate the process of oogenesis and folliculogenesis,



- explain the mechanisms leading to ovulation,
- list the functions of FSH, LH, estradiol.17 β and inhibin with regard to oogenesis and folliculogenesis,
- describe essential differences between the species with regard to ovarian activity.

Male reproductive physiology L (1h)

Students should be able to:

- explain the aforementioned male reproductive functions respectively processes and describe essential differences between the species.

Biotechnology Male 1 +2 L (2h)

Students should be able to:

- list the “milestones” in the history of the development of instrumental insemination,
- explain the extraction and assessment of ejaculates
- explain the methodology of cryo-preservation of ejaculates,
- describe the types of confectioning of sperm and insemination boxes for the most important domestic species,
- explain the methodology for the preparation of sexed sperm

Diseases of the male reproductive organs 1 + 2 + 3 L (4h)

Students should be able to:

- describe the causes, symptoms, prognosis and treatment for disorders in the area of the penis and prepuce,
- describe the causes, symptoms, prognosis and treatment for the previously discussed disorders in the area of the scrotum, the testes, epididymis and accessory sex glands,
- describe current views on the etiology of cryptorchidism and its different forms,

- explain methods for the diagnosis of cryptorchidism,
- explain how to proceed in of cases of cryptorchidism with regard to the species, age and findings.

Mating infections L (1h)

Students should be able to:

- list the most important mating infections in native domestic animals,
- describe measures for the prevention of mating infections.

Diseases of the vagina, cervix L (1h)

Students should be able to:

- describe the most important diseases of the vagina and cervix and explain the appropriate therapeutic measures.

Suppression of female reproduction L (1h)

Students should be able to:

- list the indications and starting points for the suppression of the female reproductive functions,
- explain the methods and risks of a suppression of the female reproductive functions.

Diseases of the ovary + fallopian tube L (2h)

Students should be able to:

- list clinically significant diseases of the ovary and fallopian tube and explain their
- causes and pathogenesis.

Diseases of the uterus in ruminants and pigs L (1h)

Students should be able to:

- list clinically significant diseases of the uterus in cattle and pigs and explain their causes and pathogenesis,
- develop concepts for the therapy and prophylaxis of clinically significant diseases of the uterus in cattle and pigs.

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Diseases of the uterus – horses L (2h)

Students should be able to:

- describe the most important diseases of the uterus in mares and explain the respective therapeutic measures.

Instrumental insemination L (2h)

Students should be able to:

- describe the theoretical basic principles of the artificial insemination of horses, cattle, pigs, sheep, goats and dogs,
- give a list of the most important legal regulations that result from the animal breeding regulations concerning artificial insemination.

Fertility disorders – small animals L (2h)

Students should be able to:

- describe the diagnostic procedures for the leading symptoms discussed and explain the underlying patho-physiological mechanisms that cause these disorders.

Endocrine regulation of gestation L (1h)

Students should be able to:

- explain the maternal recognition of gestation (if known for the different species),
- outline the most important hormonal alterations associated with gestation with regard to the species and explain their physiological significance (if known).

Birth puerperium – small animals L (3h)

Students should be able to:

- describe the process of a normal birth and the course of puerperium in dogs and cats, as well as the obstetrical examination,
- explain the course of a caesarean section and the resuscitation of pups.

Gestation of ruminants L (1h)

Students should be able to:

- describe significant features of the gestation of cattle, sheep and goat that are specific to the different species,
- explain possible methods of the clinical and hormonal diagnostics of gestation,
- list possibilities of the induction of abortion and birth for cattle, sheep and goat and explain their functions.

Gestation of pigs L (1h)

Students should be able to:

- describe significant features of the gestation of pigs that are specific to the species,
- explain possible methods of the clinical and hormonal diagnostics of gestation,
- list possibilities of the induction of abortion and birth for pigs and explain their functions.

Gestation of horses L (1h)

Students should be able to:

- describe significant features of the gestation of horses that are specific to the species,
- explain possible methods of the clinical and hormonal diagnostics of gestation,
- list possibilities of the induction of abortion and birth for horses and explain their functions.



Gestation of small animals L (1h)

Students should be able to:

- describe significant features of the gestation of dogs and cats that are specific to the different species,
- explain possible methods of the clinical and hormonal diagnostics of gestation,
- list possibilities of the induction of abortion and birth for dogs and cats and explain their functions.

Gestation disorders L (3h)

Students should be able to:

- describe the systematic of gestation disorders and describe the underlying patho-physiological mechanisms.

Dystocia – horses 1 +2 L (2h)

Students should be able to:

- explain the physiological birth process of mares, the detection of possible deviations and their causes, as well as the carrying out of the obstetric examination and conservative obstetrics,
- describe measures to treat dystocia and explain the indication, preparation and carrying out of surgical obstetrics.

Dystocia – swine L (1h)

Students should be able to:

- explain the physiological birth process of pigs, the detection of possible deviations and their causes, as well as the carrying out of the obstetric examination and conservative obstetrics, and explain the indication, preparation and carrying out of surgical obstetrics.

Dystocia – small ruminants L (1h)

Students should be able to:

- explain the physiological birth process of small ruminants, the detection of possible deviations and their causes, as well as the carrying out of the obstetric examination and conservative obstetrics, and explain the indication, preparation and carrying out of surgical obstetrics.

Birth and puerperium L (1h)

Students should be able to:

- explain the significant processes during birth and the underlying control mechanisms,
- explain the processes that happen on the uterine, ovarian and pituitary level during the puerperium.

Dystocia – cattle 1 +2 L (2h)

Students should be able to:

- explain the physiological birth process of cattle, the detection of possible deviations and their causes, as well as the carrying out of the obstetric examination and conservative obstetrics,
- describe measures to treat dystocia and explain the indication, preparation and carrying out of surgical obstetrics.

Puerperium – ruminants L (1h)

Students should be able to:

- describe the course of the puerperium of cattle, sheep and goats and its disruptions and explain the possibilities of veterinary intervention.

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Puerperium – horses L (1h)

Students should be able to:

- describe the course of the equine puerperium and its disruptions and explain the possibilities of veterinary intervention.

Puerperium and diseases of the teats – swine L (1h)

Students should be able to:

- describe the physiological and anatomical characteristics of the puerperium of pigs and explain the pathogenesis of the diseases that are presented,
- describe the diseases of the teats that are presented and explain the possibilities of veterinary intervention.

General neonatology L (2h)

Students should be able to:

- describe the anatomical and physiological principles of the shift from intrauterine to extra uterine life and perform a neonate examination.

Neonatology – small animals L (1h)

Students should be able to:

- describe the physiological and anatomical characteristics of neonatal pups and explain the pathogenesis of the diseases that are presented.

Neonatal foals I L (2h)

Students should be able to:

- explain the characteristics of the adaptation of newborn foals to the environment, and explain the primary care,



- explain the aetiology of Neonatales Atemnotsyndrom, as well as its treatment and correlation with pre-maturity; Lebensschwachesyndrom and equine NMD,
- describe the most common diseases of foals during their first days of life with regard to diagnostics, treatment and prognosis.

Neonatal foals II L (2h)

Students should be able to:

- explain the leading symptoms of the “acute abdomen” in foals and name the diseases that might have caused it,
- describe the differential diagnostics, causes and specific therapeutic measures that apply to the diseases in question,
- meconium obstruction, including conservative and surgical treatment,
- uroperitoneum, including surgical treatment,
- umbilical diseases (omphalitis and its forms and uracheal fistula),
- explain the neonatal septicaemia of foals with regard to aetiology, diagnostics, treatment and prognosis.

Neonatal piglet L (1h)

Students should be able to:

- explain the diseases that are presented and explain the possibilities of veterinary intervention.

Neonatal calf I + II L (3h)

Students should be able to:

- explain the adaptation of the newborn calf to the environment and describe primary care and the diseases of the umbilicus with regard to aetiology, diagnostics, treatment and prognosis.
- describe frequent diseases of calves during the first days of life with regard to diagnostics, treatment and prognosis.

Neonatal lamb L (2h)

Students should be able to:

- describe the most frequent diseases of lambs during the first days of life with regard to diagnostics, treatment and prognosis.

Reproduction specific animal species L (3h)

Students should be able to:

- describe the reproductive cycle, gestation and birth of the animal species discussed and explain the pathogenesis of the diseases that are presented.

Motherless rearing L (1h)

Students should be able to:

- describe motherless rearing of pups and foals.

Diseases of the teats – small animals L (2h)

Students should be able to:

- describe the diseases in question (mammary tumour, mastitis, fibroadenomatosis) and explain the possibilities of veterinary intervention.

Diseases of the udder – horses L (1h)

Students should be able to:

- explain the aetiology, diagnostics and treatment of mastitis in mares and describe further diseases of the udder.

Institute of Pharmacology and Toxicology (Petzinger, Geyer et al.)

Anti-infectives – lincosamides, polypeptid-antibiotics, fusidic acid and phenicoles L (1h)

Students should be able to:

- comment on structure, target, side effects and possible uses.



Anti-infectives – pleuromutilines, lonophores, tuberculostatics, virostatics, current resistance situation L (2h)

Students should be able to:

- comment on the structure, target, side effects and possible uses of anti-infectives, tuberculostatics and virostatics,
- comment on the current resistance situation and its presumable causes.

Institute of Veterinary Pathology
(Reinacher, Herden, et al.)

Pathology reproductive organs I L (3h)

Students should be able to:

- identify the pathological processes and conditions of domestic animals,
- explain the entities relating to the individual organ systems,
- define and classify the diseases and explain them comprehensively in connection with the clinical picture,
- explain the aetiology and pathogenesis of these developments, as well as confirm the correct morphological

diagnoses and discuss differential diagnoses.

A detailed list of topics is available at StudIP:

<https://studip.uni-giessen.de/studip/>

Miscellaneous

Clinical demonstrations S (14h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Animal breeding legislation (Comprehensive Course) (1h)

Students should be able to:

- describe the current EU legislation for the health surveillance and for the running of a semen collection centre and explain the duties of the veterinarian when monitoring a semen collection centre.

LIVESTOCK MANAGEMENT

Summary:

The students will get to know the basic principles concerning livestock management of agricultural livestock (pigs, cattle, small ruminants) and horses. Major emphasis will be placed on the training of the students in systemic thinking, in the sense of integrated supervision and the classification of veterinary measures into process chains. Diseases will be discussed with regard to their economic relevance and their prevention on stock level.

Further details (e.g. reading list) on the individual courses can be found online at: <http://www.uni-giessen.de/cms/fbz/fb10/studium-und-pruefungen/studium/curriculum>

Courses in detail:

Unit for Biomathematics and Data Processing (Failing)

Epidemiology in livestock management L (2h)

Students should be able to:

- explain epidemiological measured values, such as forms of prevalence, incidence and key performance indicators of diagnostic tests,
- consider the calculation of sample size for random samples,
- explain further statistical methods.

Clinic for Reproduction (Wehrend et al.)

Diseases of the teats – small ruminants L (1h)

Students should be able to:

- describe the diseases in question and explain the possibilities of veterinary intervention.

Mastitis – cattle L (2h)

Students should be able to:

- explain the aetiology and the forms of mastitis, as well as their diagnostics.

Application of antibiotics mastitis L (1h)

Students should be able to:

- explain the target-oriented application of antibiotics in the treatment of mastitis with regard to effectivity, consequences for food regulation and practical application.

Injuries of the teats – cattle L (1h)

Students should be able to:

- differentially explain the aetiology and diagnostics of injuries of the teats and describe therapeutic measures, including surgical procedures.

Approaches regarding livestock suffering from fertility disorders L (3h)

Students should be able to:

- explain how to approach the problems in question that occur in the livestock and explain the basic principles of the respective preventative measures,
- explain the following leading symptoms of the livestock, “repeated cycles”, “deficient rutting severity” and “high incidence of placenta retentions”.

Hormonal programmes – cattle L (1h)

Students should be able to:

- explain the hormonal programmes in question.

8TH SEMESTER

Supervision of horse breeding farms L (1h)

Students should be able to:

- explain the duties of the veterinarian concerning the different forms of the supervision of horse breeding farms.

Key performance indicators of fertility – swine L (1h)

Students should be able to:

- explain and interpret the key performance indicators of fertility in question.

Key performance indicators of fertility – cattle L (1h)

Students should be able to:

- explain and interpret the key performance indicators of fertility in question.

The problem of mastitis in livestock L (2h)

Students should be able to:

- explain the causes that may lead to inadequate health conditions of the udders in herds and the respective measures to prevent diseases of the udder.

Clinic for Birds, Reptiles, Amphibians and Fish (Lierz et al.)

Livestock management of poultry L (1h)

Students should be able to:

- describe the organisation, including different husbandry systems of poultry,
- explain the duties of a veterinarian in the supervision of poultry livestock.

Livestock management of poultry L (2h)

Students should be able to:

- describe the most important causes of loss of efficiency that are due to conditions of keeping,
- interpret the key performance figures of a herd,

- explain the prophylactic planning and diagnostic procedures concerning live-stock.

Clinic for Farm Animals (Internal Medicine and Surgery) (Doll, Reiner et al.)

Livestock management of cattle L (5h)

Students should be able to:

- list the production processes in the fields of dairy farming, suckling cow husbandry and
- bull fattening,
- describe the disease complexes that occur in the individual husbandry and production forms, age groups and levels of efficiency,
- describe diagnostic methods for their early detection on livestock level,
- point out appropriate concepts for prophylaxis and treatment.

Veterinary supervision of pigs L (4h)

Students should be able to:

- explain the meaning and process of the veterinary supervision of pigs,
- describe the most important content of the relevant laws and regulations (in particular the directives on the hygienic keeping of pig and the protection of livestock),
- take an appropriate history and interpret the findings of the inspection,
- link industrial and infectious factors and understand their interactive effect,
- name measures for the improving of suboptimal husbandry-, feeding-, hygiene- and management factors.

Miscellaneous

Clinical demonstrations S (4h)

The content of the clinical demonstrations will refer to the patients currently treated in the clinics and thus are unknown in advance.

Basic principles of livestock management

(Comprehensive Course) (2h)

Students should be able to:

- explain the importance of quality assurance systems in veterinary medicine concerning livestock with regard to the quality of foodstuff of animal origin,

- explain the basic rules that define how to create a programme of supervision for the respective stock,
- provide information on future tasks of the veterinarian in the field of treating livestock,
- explain the general economic conditions concerning animal production, the most important business terms as well as the significance of hygiene management and quality assurance systems,
- explain the fundamental principles of the Integrated Livestock Management, including the SWOT-analysis, and point out the possibilities and the relevance of the registration of master and transaction data.



HUSBANDRY AND DISEASES OF ORNAMENTAL AND FARMED FISH AND REPTILES/AMPHIBIANS

Coordinator:
Lierz

Instructors:
Nilz, Heuser, Mutschmann

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
Farmed and ornamental fish:
The most important parasitic, bacterial and viral infectious diseases that occur in ornamental and farmed fish will be explained. The aetiology, pathogenesis, epidemiology, clinic, pathology, diagnosis

and treatment as well as the prophylaxis will be discussed.

Reptiles / amphibians:
The most important parasitic, bacterial and viral infectious diseases that occur in reptiles and amphibians will be explained with regard to their aetiology, pathogenesis, epidemiology, clinic, pathology, diagnosis, treatment and prophylaxis.

Overall aims and objectives:

Farmed /ornamental fish:

Students should be able to:

- describe the most important infectious diseases of ornamental and farmed fish and classify the respective importance of an outbreak of A disease for the individual animal and the stock,
- describe the clinics and pathology of these infectious diseases and distinguish between them,
- give direct and indirect detection methods that are appropriate for the respective pathogens and interpret the results of the examination,



- assess whether, and if so, which therapeutics are suitable for the treatment of the different infectious diseases,
- define and explain the possibilities of prophylaxis for the different infectious diseases.

Reptiles / Amphibians:

Students should be able to:

- describe the most important infectious diseases of reptiles and amphibians and classify them according to importance of an outbreak of the disease for the individual animal and the stock,
- describe the clinics and pathology of these infectious diseases and distinguish between them,
- give direct and indirect detection methods that are appropriate for the respective pathogens and interpret the results of the examination,
- assess whether, and if so, which therapeutics are suitable for the treatment of the different infectious diseases,

- define and explain the possibilities of prophylaxis for the different infectious diseases.

Reading list:

„FISH DISEASE“: Diagnosis and Treatment, Edward J. Noga, Mosby-Year Book, Inc., 367 S., ISBN 8138 2558 X, 2. Auflage, erschienen 2000

BSAVA Manuel of Ornamental Fish, von William H. Wildgoose, 304 S., 2. Auflage, erschienen bei Blackwell Pub Professional, ISBN: 978-0-905214-57-3

Mader, Reptile Medicine and Surgery, W.B. Saunders Company Jun 2007, ISBN-13: 9781416053910

Scheller und Pantchev: Parasitologie bei Schlangen, Echsen und Schildkröten, Chimaïra 2008, ISBN-13: 978-3-89973-472-0

R. Riehl und H. Baensch, „Aquarien Atlas“, Mergus Verlag (verschiedene Bände), z.B. 15. Auflage: (2006), ISBN-13: 978-3882442274

„Fischkrankheiten“, Rudolf W. Hoffmann, Verlag Eugen Ulmer

Sandra Lechleiter und Dirk Willem Kleingeld, „Krankheiten der Koi und anderer Gartenteichfische“, Verlag: Ulmer (Eugen); 3.aktualisierte und erweiterte Auflage (2005), ISBN-13: 978-3800174980

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in “Poultry diseases” in the eleventh semester





DISEASES OF PET BIRDS, WILDFOWL AND POULTRY

Coordinator:
Lierz

Instructors:
Heffels-Redmann, Lierz

Course type:
lecture (1 CHW)

ECTS:
1

Introduction:
Infectious diseases are of particular relevance to poultry, but also pet birds and wildfowl populations. The following as-

pects will be discussed: etiology, pathogenesis, epidemiology, clinic, pathology, diagnostics and treatment with particular attention being paid to the prophylaxis of viral, bacterial, mycotic and parasitic diseases.

Finally, the most important surgical interventions concerning pet birds will be introduced; behavioural disorders of parrots will also be focussed on.

Overall aims and objectives:

Students should be able to:

- list the most important infectious diseases of pet birds, wildfowl and poultry and assess the relevance of an outbreak of disease for the individual animal, the stock, the population as well as for humans,
- describe the clinics and pathology



of these infectious diseases and define them,

- name direct and indirect methods of detection for the respective pathogens and interpret the results of the examination,
- decide whether, and if so which, therapeutic methods are suitable for the treatment of the different infectious diseases,
- define and explain the possibilities of general and specific prophylaxis, in particular in the form of vaccinations, for the different infectious diseases.
- describe and explain the most important surgical interventions concerning pet birds,
- describe the causes of behavioural disorders in parrots.

Reading list:

Siegmann, Neumann: Kompendium der Geflügelkrankheiten, Verlag: Schlütersche, 6. aktualisierte und erweiterte Auflage (2005), ISBN-13: 978-3877067444

Kaleta, Krautwald-Junghanns: Kompendium der Ziervogelkrankheiten, Verlag: Schlütersche, 3. überarbeitete Auflage (2007), ISBN-13: 9783899930221

Pees: Leitsymptome bei Papageien und Sittichen, Verlag: Enke, 1. Auflage, ISBN: 3-8304-1023-9

Chitty und Lierz: BSAVA Manual of Raptors, Pigeons and Passerine Birds, BSAVA Company, ISBN: 978-1-905319046

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Self-assessment:

See questionnaire (available at the Office of the Clinic for Birds, Reptiles, Amphibians and Fish)

Assessment:

an oral exam within the framework of the Veterinary Medical Examination in “Poultry diseases” in the eleventh semester

COMBATING EPIZOOTIC DISEASES AND INFECTIOUS DISEASE EPIDEMIOLOGY

Coordinator:

Baljer, Bauerfeind

Instructors:

Baljer, Bauerfeind, Herbst, Rümenapf, Thiel

Course type:

lecture (3 CHW)

ECTS:

3

Requirements:

Students must have attended the courses in: “Bacteriology and Mycology”, “Virology” and “Parasitology” in 4th and 5th semesters.

Introduction:

This course will deal with the relevance, the objectives, strategies and methods, the organisation and the legal foundations in Germany. Major emphasis will be placed on the structure and function of the official institutions that are involved in animal disease control and those institutions they cooperate with; the German and European Animal Health Laws; as well as the regulations concerning the processing of by-products of animal origin. The general part of the lecture will mainly deal with aspects of epidemics and hygiene concerning animal husbandry; the application of animal vaccines; and the national, intra-community and EU cross-border transport of goods, animals and pathogens. The specific part will specifically centre on the strategies and protective measures for the combating of individual epizootics in Germany. In

order to understand national proportions, EU regulations and other international regulations will be taken into account.

Overall aims and objectives:

Students should be able to:

- name and explain the objectives, strategies and methods of the national animal disease control,
- list epizootics and diseases of animals that are subject to reporting and risk assess with regard to the risk of exposition,
- explain the processes of epizootic legislation,
- list the institutions that are concerned with the control of epizootics and define their respective areas of responsibilities,
- explain the relevant animal health legislations (Animal Diseases Act, animal transport-regulation, vaccine-regulation etc) and explain their aims and content,
- explain the Federal Ordinances issued for the control of specific epizootics and explain their aims and content,
- apply animal health regulations on specific questions (e.g. animal transports, the disposal of animal cadavers, application of vaccines, outbreaks of epizootics),
- discuss and assess the advantages and disadvantages of measures of the epizootics legislation.

Reading list:

Geissler, Rojahn, Stein: Sammlung Tierseuchenrechtlicher Vorschriften. Verlag R. S. Schulz, München.

Bisping: Kompendium der Staatlichen Tierseuchenbekämpfung, Verlag: Hippokrates (1999), ISBN-13: 978-3777314235

Electronic sources:

Relevant information on the following websites:

- www.bmelv.de,
- www.bmg.bund.de
- www.oie.int
- www.vetion.de
- <http://eur-lex.europa.eu>
- www.fli.bund.de

Scripts:

Accredited participants can obtain current lecture notes (selection) from the internet platform Stud.IP. Older documents can be obtained from the students body of lecture notes.

<https://studip.uni-giessen.de/studip/>

Self-assessment:

A questionnaire is available on the homepage of the Institute of Animal Hygiene and Infectious Diseases.

http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/ihyt/Lehre/fragenkataloge

Learning recommendations:

Students are advised to thoroughly re-read their lecture notes with the help of textbooks, legal documents and the questionnaire. A division of the work and joint meetings with fellow students can also be very helpful.

Assessment:

an oral examination (100%) within the framework of the Veterinary Medical Examination in “Combating Epizootic Diseases And Infectious Disease Epidemiology” after the eighth semester

HISTOPATHOLOGY-PATHOLOGICAL-HISTOLOGICAL COURSE

Coordinator:
Reinacher

Instructors:
Henrich, Herden, Huisinga, Kohler, Reinacher

Course type:
practical (2 CHW)

ECTS:
3

Requirements:
Students must have attended the lecture on “General pathology”, the seminar on “General pathology” and the seminar on “Specific pathology”

Introduction:
An explanation of the methods, options and limitations of histopathology; a discussion of selected histopathological specimens; an explanation of aetiology and pathogenesis based upon the histomorphological alterations; and a discussion of possible differential diagnoses. Among others, the following topics / specimens will be discussed: the histopathology of inflammation, the alterations of the cardiovascular system, the lungs, the digestive system, the urinary and sexual organs, the locomotor system, the skin and nervous tissue, as well the histopathology of selected neoplasia.

Overall aims and objectives:

Students should be able to:

- identify histological specimens,
- describe and explain the alterations,
- make histopathological diagnoses and discuss possible differential diagnoses.

A detailed list of specimens is accessible via StudIP.

Reading list:

Dahme/Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke; 6. völlig neu bearb. Auflage (2007), ISBN-13: 978-3830410485

Baumgärtner: Pathohistologie für die Tiermedizin, Verlag: Enke; 1. Auflage (2007), ISBN-13: 978-38304105464

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Scripts:

script provided by the student representatives

Learning recommendations:

Students are advised to improve their histological basic knowledge of the organs and tissues, to examine the specimens during the course, to compare them with the script and text books and complete them. All further questions should be directed at the instructor

Assessment:

an oral and a practical examination within the framework of the Veterinary Medical Examination in "General and Specific pathology, pathological anatomy and histology" in the eleventh semester

FOOD HYGIENE

Coordinator:

Bülte, Eisgruber

Instructors:

Bülte, Eisgruber, Zens

Course type:

lecture (4 CHW)

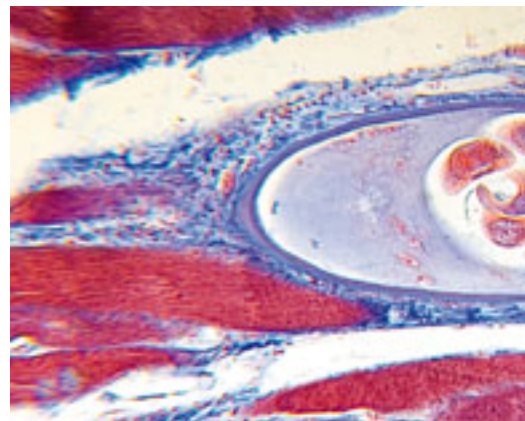
ECTS:

4

Introduction:

The lecture (a total of 56 hours) will serve to:

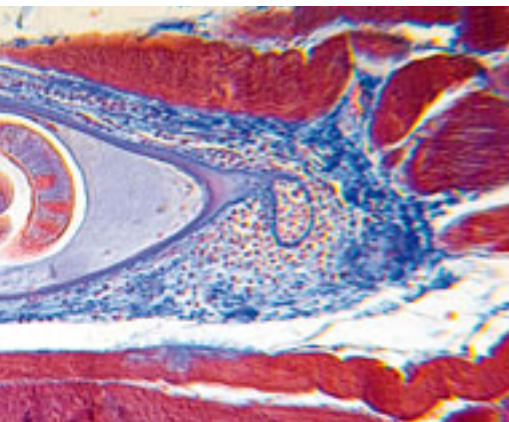
- increase the students' knowledge within the topic of food hygiene in the field of food production (products of animal origin) and its placing on the market
- impart knowledge of the duties of the official veterinarian in the field of food hygiene
- impart knowledge of the legal rules and regulations, respectively the official inspections as well as the placing on the market of foods of animal origin.



Overall aims and objectives:

Students should be able to:

- give an overview of the expertise in food of animal origin (meat products including poultry, as well as eggs, fish, crustaceans and molluscs, mussels and honey),
- give an overview of the horizontal and vertical legal regulations on a national and European level,
- explain classic and modern methods of product manufacturing (including novel/functional food and GMO) and explain the legal requirements,
- point out the criteria of preservability of foods of animal origin,
- describe the possible negative influences (including microbiology, residues and storage pests) and the legal assessment,
- discuss specific micro-organisms with regard to risks for human health,
- convey the legal principles and requirements with regard to food supervision and control,
- explain the legal principles and requirements regarding their placing on the market (including specific forms of marketing) of products.



Reading list:

K. Fehlhaber, J. Kleer, F. Kley (Hrsg.): Handbuch Lebensmittelhygiene (2007), Behr's Verlag,

Horizontal and vertical regulations of the Foodstuff Hygiene Ordinance.

Electronic sources:

- Homepage of the Department of Veterinary Food Science (IFTN)
- Stud.IP JLU Giessen
<https://studip.uni-giessen.de/studip/>

Scripts:

“Handouts / Downloads” for each lecture block are available on the homepage of the IFTN; scripts on food inspection and technology on the homepage of the IFTN

Self-assessment:

questions on the homepage of the IFTN

Learning recommendations:

- preparation and revision of the respective handouts,
- in-depth reading of the relevant scripts / literature.

Assessment:

an oral and a practical examination within the framework of the Veterinary Medical Examination in “Food science, including food hygiene “in the eleventh semester

8TH SEMESTER

FOOD EXAMINATION AND TECHNOLOGY (“FOOD PRACTICAL”)

Coordinator:
Bülte, Eisgruber

Instructors:
Bülte, Eisgruber, Zens (+ assistants)

Course type:
practical (2 CHW)

ECTS:
3

Introduction:
The practical will serve to:

- demonstrate meat production
- demonstrate the official food examination including a legal assessment of the hygienic condition
- carry out a general and specific inspections
- complete a food inspection report

Overall aims and objectives:
Students should be able to:

- explain the legal principles and requirements of official food inspections
- carry out independently (while under supervision) the practical official inspection of food (including the sensory, bacteriological, histological and chemical-physical inspection)
- complete a report within the framework of the legislation of the official food inspection
- give a practical outline of product manufacturing (the group of raw, broiled- and
- cooked sausages)

Reading list:
K. Fehlhaber, J. Kleer, F. Kley (Hrsg.):
Handbuch Lebensmittelhygiene (2007),
Behr's Verlag,

Horizontal and vertical regulations the
Foodstuff Hygiene Ordinance.

Electronic sources:

- Homepage of the Institute of
Veterinary Food Science (IFTN)
- Stud.IP JLU Giessen
<https://studip.uni-giessen.de/studip/>

Scripts:

- “Handouts / downloads” for each lecture block are available on the homepage of the IFTN
- Scripts on food inspection and technology on the homepage of the IFTN.
http://www.uni-giessen.de/cms/fbz/fb10/institute_klinikum/institute/nahrungsmittelkunde/institut

Self-assessment:
Questions on the homepage of the IFTN

Learning recommendations:
preparation and revision of the respective topic; in-depth reading of the relevant scripts /literature

Assessment:
an oral and a practical examination within the framework of the Veterinary Medical Examination in “Food Science, including food hygiene” in the eleventh semester

PATHOLOGICAL-ANATOMICAL DEMONSTRATIONS

Coordinator:
Reinacher

Instructors:
Henrich, Herden, Huisinga, Köhler, Reinacher

Course type:
one hour practical and one hour seminar per week, every two weeks in 2 alternating groups over the period of 2 semesters

ECTS:
1,5

Requirements:
Students must have attended the lecture and the seminar on “General pathology”

Introduction:
The participants of the course will work with material taken from routine autopsies of the institute, archived materials and material of slaughtered animals. The alterations in organs will be discussed in groups with an assistant present. The pathological-anatomical and differential diagnoses will be collected and discussed. Each case will be discussed epically, referring to its possible etiologies, pathogenesis and clinical relevance.

Overall aims and objectives:

Students should be able to:

- produce a forensically applicable organ report. This will include a complete description of the alterations in the organs, the formulation of the pathological-anatomical diagnoses, the differential diagnoses and the epicrisis.

Reading list:

Dahme/Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke; 6. völlig neu bearb. Auflage (2007), ISBN-13: 978-3830410485

McGavin/Zachary: Pathologic Basis of Veterinary Disease, Verlag: Mosby; 4th ed. (2006), ISBN-13: 978-0323028707

respectively the translated version: Pathologie der Haustiere: Allgemeine, spezielle und funktionelle Veterinär-pathologie- mit Zugang zum Elsevier-Portal, Verlag: Elsevier, München (2009), ISBN-13: 978-3437582509 A

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

a final discussion / attestation after the eighth semester, and an oral and a practical examination within the framework of the Veterinary Medical Examination in “General pathology and specific pathological anatomy and histology” in the eleventh semester

FUNCTIONAL PATHOLOGY

Coordinator:
Reinacher

Instructors:
Employees of the Klinikum, Henrich,
Herden, Huisinga, Köhler, Reinacher

Course type:
seminar (1 CHW)

ECTS:
1

Requirements:
Students must have attended the lecture on “General Pathology”, the seminar on “General Pathology” and the seminar on “Specific Pathology”

Introduction:
Case analysis as an integrated course with the participation of clinical or paraclinical facilities.
The students will discuss a clinical case, including its history and symptoms, clinical and laboratory diagnostic findings, its development and patho-morphological alterations. Further topics of discussion will be the differential diagnoses, the aetiology and pathogenesis of the disease and the final epicritic assessment.

Overall aims and objectives:

Students should be able to:

- discuss a clinical case and assign the symptoms to the clinical, patho-morphological and laboratory diagnostic findings.

Reading list:

Dahme/Weiss: Grundriss der speziellen pathologischen Anatomie der Haustiere, Verlag: Enke; 6. völlig neu bearb. Auflage (2007), ISBN-13: 978-3830410485

McGavin/Zachary: Pathologic Basis of Veterinary Disease, Verlag: Mosby; 4th ed. (2006), ISBN-13: 978-0323028707

respectively the translated version: Pathologie der Haustiere: Allgemeine, spezielle und funktionelle Veterinär-pathologie- mit Zugang zum Elsevier-Portal, Verlag: Elsevier, München (2009), ISBN-13: 978-3437582509 A

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

The documents required will be available on StudIP

Assessment:

an oral and a practical examination within the framework of the Veterinary Medical Examination in “General pathology and specific pathological anatomy and histology” in the eleventh semester

FORENSIC VETERINARY MEDICINE, PROFESSIONAL AND ETHICAL LAW

Coordinator:

Fey

Instructors:

Fey, Roscher

Course type:

lecture (1 CHW)

ECTS:

1

Introduction:

- knowledge of the law of obligation and its impact on purchase law
- requirements of due diligence of the veterinarian
- issues of liability that are important for the veterinary practice
- aspects of penal law that may be of importance for the veterinary practice

Overall aims and objectives:

Students should be able to:

- apply their knowledge of those articles that regulate the law of obligation, in particular its impact on purchase law, in case studies,
- list the general and specific requirements of due diligence of the veterinarian and describe the consequences in the case of a breach of these requirements,
- enumerate issues of liability that are important for the veterinary practice and know ways to financially safeguard themselves against possible risks
- explain aspects of penal law that may be of importance for the veterinary practice

Reading list:

Althaus J., Ries, H.P., Schnieder K.-H., Großböling, R. (Hrsg.): Praxishandbuch Tierarztrecht. Schlütersche Verlagsgesellschaft 2006, 1. Auflage (2006), ISBN-13: 978-3899930207

Brennecke D., Münow, F.: Existenzgründung kompakt. Veterinärspiegel Verlag 2008, ISBN: 978-3-86542-012-1

Electronic sources:

see StudIP:

<https://studip.uni-giessen.de/studip/>

Assessment:

a written examination (MCQ) within the framework of the Veterinary Medical Examination in "Forensic veterinary medicine, professional and ethical law" after the eighth semester



9TH / 10TH SEMESTER

Blocks	WEEKS	ECTS
Block 1 Clinic for Horses – Internal Medicine	2	4
Block 2 Clinic for Horses – Surgery	2	4
Block 3-4 Clinic for Small Animals – Internal Medicine	4	8
Block 5-6 Clinic for Small Animals – Surgery	4	8
Block 7-8 Clinic for Reproduction	4	8
Block 9 Clinic for Birds, Reptiles, Amphibians and Fish	2	4
Block 10 Clinic for Farm Animals (ruminants)	2	4
Block 11a Bacteriology and Mycology	1	2
Block 11b Virology	1	2
Block 12a Pathology	1	2
Block 12b Clinic for Farm Animals (swine)	1	2
Practical	WEEKS	ECTS
Slaughterhouse	3	6
Public health	2	4
Food control	2	4
Clinic	16	32



Examinations		ECTS
Partial Exam (oral, during clinical rotation): Internal Medicine (30% Veterinary Medical Examination)		0,5
Partial Exam (oral, during clinical rotation): Surgery and Anaesthesiology (30% Veterinary Medical Examination)		0,5
Partial Exam (oral, during clinical rotation): Reproductive Medicine (30% Veterinary Medical Examination)		0,5
Veterinary Medical Examination: General and Specific Pathology, Pathological Anatomy and Histology		2
Veterinary Medical Examination: Poultry diseases		2
Veterinary Medical Examination: Food Science including food hygiene		2
Veterinary Medical Examination: Meat Hygiene		2
Veterinary Medical Examination: Internal Medicine (50%)		1
Veterinary Medical Examination: Surgery and Anaesthesiology (50%)		1
Veterinary Medical Examination: Reproductive Medicine (50%)		1

Imprint

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