



**University
of Veterinary Medicine
Budapest, Hungary**

Syllabus

2022



CONTENTS

1 ST YEAR.....	3
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Anatomy	4
Anatomy and development of organs	5
Animal welfare.....	6
Biology	7
Biostatistics.....	8
Biophysics.....	11
Botany - lectures	11
Botany - seminars.....	15
Guide to chemistry	17
Histology I . Lectures and practicals	19
Histology ii	20
Informatics.....	21
Veterinary- and food chemistry.....	22
Zoology.....	26
2ND YEAR	27
Agricultural economics.....	28
Anatomy	30
Applied ethology 1+2 (2015/2016)	31
Basics of clinical examination and clinical care.....	32
Biostatistics.....	33
Informatics.....	37
Topographic and applied anatomy.....	37
Veterinary genetics.....	40
Veterinary physiology 1.....	42
Veterinary physiology 2.....	45
Veterinary profession	50
Veterinary virology	51
Veterinary biochemistry	53
3RD YEAR	65
Animal breeding.....	66
Animal nutrition I.....	67
Animal nutrition II.....	74
Veterinary clinical diagnostics	77
Laboratory diagnostics.....	81
Parasitology I.....	82
Pathology a	84
General pathology lectures.....	90
Special pathology 1	91
Veterinary pathophysiology.....	98
Veterinary pharmacology.....	102
Surgery 1.....	106
Veterinary bacteriology	109
Veterinary immunology.....	116
Veterinary pathophysiology.....	119
4TH YEAR	122
Animal hygiene I.....	123
Avian and exotic animals medicine	125
Bee diseases	126
Fish diseases	126
Internal medicine 3.....	128
Internal medicine I.....	130
Internal medicine II	131
Large animal internal medicine	134
Laboratory animal science and bioethics	135
Obstetrics 1	136
Obstetrics and reproduction 1	140
Obstetrics and reproduction 1	140

Obstetrics and reproduction 2	141
Obstetrics and reproduction 2	142
Parasitology	143
Poultry pathology	144
Kórszövevény gyakorlatok /	145
histopathology practicals	145
Special pathology 3	147
Lecture course of surgery II.....	151
Surgery III.....	152
Veterinary toxicology	153
5TH YEAR	154
Animal health economics,	155
management and ethics.....	155
Animal hygiene II.....	156
Epidemiology, infectious diseases I.....	160
Epidemiology, infectious diseases II	163
Food hygiene II lectures	166
Practicals of food hygiene II	167
Forensic veterinary medicine	168
Internal medicine 3	169
Obstetrics 3 . 2017 Fall.....	172
Ophthalmology.....	174
State veterinary medicine.....	174
5 .5TH YEAR	176
11 th semester ltk practical at the department 4 weeks.....	177
Requirements for the 11 th semester at the department for exotic animal and wildlife medicine	177
Herd-health practical in dairy cattle farm	178
Practical in fish farming.....	181
Herd-health practical in pig farm.....	182
Practical in sheep farming.....	186
11 th semester extramural food	188
hygiene practical	188
Farm animal practical in the 11th semester... ..	189
Information on the laboratory diagnostic	191
practical of the 11 th semester.....	191
Requirements of small animal clinical practice	194
in the 11 th term	194
State veterinary medicine practice.....	199

1ST YEAR

ANATOMY

2017/2018 1st Semester

	Lectures	Plenary	Labs
1. 09.11-15.	Introduction: the history of anatomy, Anatomical terminology: planes, directions	Regions of the body	Regions of the body
	Bones of the trunk	Bones of the trunk	
2. 09.18-22.	Bones of the forelimb	Bones of the forelimb	Bones of the trunk
3. 09.25-29.	Bones of the hindlimb	Bones of the hindlimb	Bones of the forelimb
4. 10.02-06.	Neurocranium	Neurocranium	TEST 6 October Bones of the hindlimb
5. 10.09-13.	Viscerocranium	Viscerocranium	TEST 9 October Neurocranium
6. 10.16-20.	General arthology and myology	Basics of the dissection	TEST 19 October Viscerocranium
7. 10.23-27.	Muscles and joints of the forelimb	Muscles and joints of the forelimb	TEST 24 October Muscles and joints of the forelimb
8. 10.30-11.03.	Muscles and joints of the forelimb	Muscles and joints of the forelimb	Muscles and joints of the forelimb
9. 11.06-10.	Muscles and joints of the hindlimb	Muscles and joints of the hindlimb	Retake Test 10 November Muscles and joints of the hindlimb
10. 11.13-17.	Muscles and joints of the hindlimb	Muscles and joints of the hindlimb	Retake Test 13 November Muscles and joints of the hindlimb
11. 11.20-24.	Respiratory and abdominal muscles	Respiratory and abdominal muscles	Respiratory and abdominal muscles
12. 11.27-12.01.	Muscles of the head, neck and trunk	Muscles of the head, neck and trunk	Muscles of the head, neck and trunk
13. 12.04-08.	Statics and dynamics	Demonstration	Practical exam bone
14. 12.11-15.	The meat as food	Demonstration	Practical exam dissection

Prof. Dr. Péter Sótonyi

ANATOMY AND DEVELOPMENT OF ORGANS

2nd Semester 2017/2018

	Lecture	Plenary	Practical
1. 02 . 05 - 09 .	Blood circulation, heart	Blood circulation, heart	Blood circulation
2. 02 . 12 - 16 .	Heart	Heart, pericardium	Blood circulation, heart, pericardium
3. 02 . 19 - 23 .	Aortic arch, Thoracic aorta, V . cava cran . et caud .	Aortic arch, Thoracic aorta, V . cava cran . et caud .	Aortic arch, Thoracic aorta, V . cava cran . et caud ., blood supply of the head and neck
4. 02 . 26 -03 .02 .	Blood supply of the head and neck	Blood supply of the head and neck	Head Blood supply of the head and neck
5. 03 . 05 - 09 .	Blood supply of the hindlimb	Blood supply of the hindlimb	Blood supply of the forelimb
6. 03 . 12 - 16 .	Blood supply of the forelimb	Blood supply of the forelimb	Blood supply of the hindlimb, anatomy of the birds TEST (ca 25 structures)
7. 03 . 19 - 23 .	Oral cavity, tongue, salivary glands, Teeth	Oral cavity, tongue, salivary glands, Teeth	Oral cavity, tongue, salivary glands, teeth, pharynx
8. 03 .26 -30 .	_____	_____	_____
9. 04 .02-06 .	Pharynx, esophagus stomach, intestines of the dog	Pharynx, esophagus, stomach, intestines of the dog	
10. 04 . 09 - 13 .	Abdominal cavity of ruminants and pigs	Abdominal cavity of ruminants and pigs	Esophagus Stomach, intestines of the dog, abdominal cavity of ruminants
11. 04 . 16 – 20 .	Liver, pancreas, spleen and blood supply	Liver, pancreas, spleen and blood supply	Liver, pancreas, spleen and blood supply, abdominal cavity of pigs
12. 04 . 23 – 27 .	Respiratory apparatus	Respiratory apparatus	Respiratory apparatus
13. 04 .30-05 .05	Urinary organs, genital organs (male)	Male genital organs, pelvic blood supply	Urinary and male genital organs
14. 05 . 07 - 11 .	Genital organs (female), pelvic situs,	Urinary and female genital organs,	Female genital organs
15. 05 . 14 - 18 .	peritoneum	peritoneum	TEST (ca 30 structures)

ANIMAL WELFARE**Lectures (2×45 min)**

Technical information Definitions: animal welfare, wellbeing, rights and protection. The concept, goals and task of professional animal protection .
Veterinary task in animal protection . Historical and religious aspects: an overview . The attitude of society to the animal protection
Protection of companion, pet s and animals kept for experimental purposes
Protection of animals kept for farming purposes
Protection of animals during transport
Legal aspects of euthanasia; Legal sanctions in the field of animal welfare
Relationship between animal and environmental protection . Wildlife protection
Normal animal behaviors Physiological needs of animals (hunger, thirst, temperature, safety, reproduction etc .)
Abnormal animal behaviors . The effect of behaviour restriction on animal welfare (cages, keeping chains, crate, boredom, training)
Recognition, prevention and alleviation of animal pain and estimation of the degree of suffering. Relationship between animal abuse and social aggression .
Areas of the human-animal relationship . Problem with the non-competent civil animal protection . Case reports
Critical areas in animal protection (stray-, zoo-, circus-, experimental animals, non-professional breeding)
Animal models in human disease research . Bioethics .
How the animal protection does reflect in the media
How to educate animal protection on from kindergarten to adult education

Practicals (3×45 min)

Interpretation of media articles and events Expertise on fields of animal protection
Shelter or dog pouds? The past, the present and the future of “Illatos street”
Saved wild animals I . (bears, wolves, raccoons) Visiting in Central Europe largest bear refuge, in the Bear Farm Veresegyház
Saved wild animals II . (bears, wolves, raccoons) . Visiting in Budapest ZOO
Circus versus animal protection Visiting in the famous Richter Circus behind the scenes

BIOLOGY

Subject:	Biology
Specialization:	Veterinary medicine
Term of the subject:	I . semester
Number of lectures/semester practicals/semester	Lectures/30
Credit:	2
Prerequisites:	-
Name of Department:	Department of Anatomy and Histology
Responsible teacher (email):	
Teacher(s) take part in teaching:	
Aim of subject:	

Weekly schedule of lectures

1 . Week	Introduction Cytology
2 . Week	Cytology
3 . Week	Cytology
4 . Week	Cytology
5 . Week	Cytology
6 . Week	Cytology
7 . Week	Cell cycle, mitosis, meiosis
8 . Week	The gametes The structure of the avian egg
9 . Week	Sexual cycle, estrus, fertilization Pregnancy, determination of sex
10 . Week	Cleavage, Gastrulation
11 . Week	Differentiation of the germinal disc, Derivatives of the germinal layers
12 . Week	Infolding of the embryo, Migration and implantation
13 . Week	Placenta types

BIOMATHEMATICS

Last change: 23 .02 .2017 17:48

Course	Biomathematics
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	2/2
Credits	3
Lectures	15 lessons/semester
Practical lessons	30 lessons/semester
Specialization	veterinary (English)
Department	Department of Biomathematics and Informatics

Description

The aim of this course is to prepare you for an understanding of the basic statistical methods that are useful in your major field. Concepts are introduced in an intuitive way. The relevance of the procedures is demonstrated by examples selected from a wide area of life sciences . The course uses a common-sense approach to explain basic ideas and methods . Real-life examples show how each idea or method is applied in practice .

Practicals, dates, locations, instructors and their email addresses:

Group 1: Fri. 10:15, H1 - PÁSZTORY-KOVÁCS, Szilvia - Kovacs.Szilvia (at) univet.hu

Group 2: Thu. 14:15, H1 - LANG, Zsolt - lang.zsolt (at) univet.hu

Group 3: Fri. 08:15, H1 - ABONYI-TÓTH, Zsolt - abonyi-toth.zsolt (at) univet.hu

Group 4: Tue. 14:15, H2 - PIROSS, Imre Sándor - sandor.piross (at) gmail.com

Group 5: Fri. 08:15, H2 - PÁSZTORY-KOVÁCS, Szilvia - Kovacs.Szilvia (at) univet.hu

Group 6: Fri. 12:15, H2 - KÖVÉR, Szilvia - Kover.Szilvia (at) univet.hu

Group 7: Tue. 10:15, H1 - PIROSS, Imre Sándor - sandor.piross (at) gmail.com Group 8: Fri.

10:15, H2 - KÖVÉR, Szilvia - Kover.Szilvia (at) univet.hu

Recommended literature:

Wassertheil-Smoller: Biostatistics and Epidemiology . A Primer for Health and Biomedical Professionals, Springer, 1990, 1995, 2004 . (It can be borrowed from the University Library .)

Subject of lectures in detail

1 . week	Introduction . Descriptive and inferential statistics . Population and sample . Data types . Probability theory and statistics . Sample mean, median, lower and upper quartiles, range, variance, standard deviation .
2 . week	Probabilities and statistics. Popper's theory of falsification. Hypothesis testing, H0, H1. Clinical relevance and statistical significance. The p-value. Student's t-test, Mood's median test, Wilcoxon's rank sum test . Components of a statistical test .
3 . week	Probability theory . The notion of probability . Classical probability formula . Elementary and composite events . Relative frequency . Law of large numbers . Conditional probability and independence . Odds, logit, odds ratio and relative risk .

4 . week	Random variables, probability distributions . Discrete and continuous distributions . Density function, histogram, boxplot . Symmetric, skewed, unimodal, bimodal and multimodal distributions . Binomial, Poisson and normal distribution . Central limit theorem . Expected value, population variance and standard deviation . Independence of random variables .
5 . week	Hypothesis tests . One-sample, two-sample, multiple sample tests . Paired sample tests . One-sided and two-sided problems . Type I error, Type II error, power . Parametric tests: t-tests, F-test, Levene test, ANOVA . Nonparametric tests: sign test, Mood's median test, Wilcoxon's signed rank test, Mann-Whitney U-test, Kruskal-Wallis test .
6 . week	Analysis of qualitative data: Chi-square test, Fisher's exact test, goodness of fit test, test of independence, homogeneity test . Binomial test . Multiple testing, BonferroniHolm correction .
7 . week	Applications of probability theory in epidemiology . Theorem of total probability . Diagnostic tests. Prevalence, sensitivity, specificity, positive and negative predictive values . Bayes' theorem . Observed and true prevalence .
8 . week	Estimation. Point estimate, interval estimate. Plug-in estimate. Standard error, confidence interval. Relationship between statistical tests and confidence intervals. Equivalence tests.
9 . week	Correlation, regression . Simple and multiple linear regression . Estimation of parameters . Testing hypotheses on regression . Model diagnostics .
10 . week	Analysis of variance (ANOVA) . One-way ANOVA . Decomposition of variance . Multiway ANOVA . Model diagnostics .
11 . week	Variance-covariance analysis (ANCOVA) . Factors and covariates . Dummy variables . Interactions. Model diagnostics. Confidence bands and prediction bands.
12 . week	Design of experiments . Randomised block design . Multiple testing . Bonferroni-Holm correction . Multiple comparisons . Tukey's test, Dunnett's test . Nonparametric or distribution-free methods .
13 . week	Logistic regression . Odds ratio . Generalised linear model . The method of maximum likelihood .

Subject of practicals in detail

1 . week	R-commander, entering data, data manipulation, descriptive statistics
2 . week	Loading data . Charts .
3 . week	Charts .
4 . week	Binomial and Poisson distribution .
5 . week	Normal distribution .
6 . week	Binomial test, t-test, F-test, Levene test .
7 . week	Midterm .
8 . week	Contingency table, chi-square test, Fisher's exact test .
9 . week	Correlation, linear regression .
10 . week	ANOVA, ANCOVA .

11 . week	ANOVA, ANCOVA .
12 . week	ANOVA, ANCOVA .
13 . week	Midterm .

SAMPLE

BIOPHYSICS

Subject of lectures in detail

1.	Measurements, physical quantities, units, errors of a measurement, error propagation . Macro-transport processes: flow of fluids I. ideal fluids
2.	Flow of fluids II. viscous fluids, viscous drag force, flow in the circulatory system
3.	Micro-transport processes Diffusion, osmosis, transport across membranes, facilitated diffusion, active transport
4.	Sedimentation, ultracentrifugation . Physics and applications of light (electromagnetic waves): geometric optics, light reflection, light refraction, total reflection
5.	Refraction in planparallel slab, refraction on prism, dispersion of light, optical image formation, plane mirror, optical lenses, the ray tracing technique, thin lens equation, thick lenses
6.	The human eye, visual acuity, colour perception, optical defects in vision, the simple magnifier, the compound microscope, wave (or physical) optics, principle of superposition, interference
7.	Huygens-Fresnel principle, light diffraction, resolving power of optical devices, the Abbe criterion, special microscopes
8.	Matter waves, transmission and scanning electron microscopes, the photoelectric effect, light – matter interaction, scattering, absorption, light attenuation in matter
9.	Principle and properties of lasers. Production, properties and effects of X-rays, the X-ray spectra, attenuation of X-rays in matter
10.	Electric properties of living substances: passive and active properties, the formation and properties of the resting membrane potential, Nernst equations, Na-K pump, response to weak stimulus, the action potential and its propagation
11.	Measurement of the membrane potential . Body surface biopotentials: ECG, EEG, the cathode-ray oscilloscope, high frequency heat generation (electric diathermy)
12.	Basics of nuclear physics and nuclear radiations: natural radioactivity, composition of a nucleus, isotopes, binding energy, radioactive decay law, half-time, radio- carbon dating, nuclear reactions, chain reactions, transmission of nuclear radiation through matter
13.	Dosimetric units, biological effects of ionising radiations, basic principles of radiation protection, radiation detectors
14.	The radioactive tracer method and its applications . Modern imaging techniques in medicine: image formation using radioactive isotopes, thermography
15.	Ultrasound and its medical applications, Doppler effect, echoencefalography, X-ray tomography, positron emission tomography (PET), magnetis resonance imaging (MRI)

BOTANY - LECTURES

Course	Botany - Lectures
Language	English
Nature	mandatory
Method of evaluation	semi-final examination

Year/semester	1/2
Credits	2
Lectures	30 lessons/semester
Practical lessons	0 lessons/semester
Specialization	veterinary (English)
Department	Department of Botany

Responsible teacher (email): Dr . Cserhalmi Dániel (Cserhalmi .Daniel@univet .hu)

SAMPLE

Weekly schedule of lectures	
Week	Lectures
1 .	Introduction, importance, nomenclature
2 .	Morphology of vegetative organs
3 .	Morphology of generative organs

4 .	Plant cytology
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Teacher(s) take part in teaching: Dr . Péli Evelin (Peli .Evelin .Ramona@univet .hu), Kutszegi Gergely (Kutszegi .Gergely .Jozsef@univet .hu)

Aim of subject:

General task of our subject is to characterize the Plant Kingdom as the unique living group of ecosystem for production of organic molecules . We would like to give information for students, which can connect to their other subjects. Specific aim of our botany to present the most important and relevant data on poisonous and forage plants including the hay producing grasses .

Mandatory literature: Lecture notes

Recommended literature:

1 . Horváth, Zs . - Vetter, J .: Applied botany for Veterinary Students . SZIE AOTK, Budapest, 2003 . 2 . Frohne, D . - Pfander, H .J .: Poisonous Plants . Manson Publishing Ltd London, UK 2005 .

Note: Our students can practice and study all botanical preparatives (seeds, herbarium sheets, grasses, cereals) in the practical (study) room of the Department (Rottenbiller street 50, floor 1, room 7). **Opening hours:** M-Th: 8-16, Fr: 8-12 .

Subject of lectures in detail

SAMPLE

5 .	Plant histology
6 .	Histology of plant organs
7 .	Physiology and nutrient metabolism
8 .	Secondary metabolites 1 .
9 .	Secondary metabolites 2 .
10 .	Taxonomy 1 .
11 .	Taxonomy 2 .
12 .	Biogeography of Europe
13 .	Botanical questions of food safety, toxicology
14 .	Consultation

SAMPLE

BOTANY - SEMINARS

Course	Botany - Seminars
Language	English
Nature	mandatory
Method of evaluation	signature
Year/semester	1/2
Credits	3
Lectures	0 lessons/semester
Practical lessons	45 lessons/semester
Specialization	veterinary (English)
Department	Department of Botany

Responsible teacher (email): Dr . Cserhalmi Dániel (cserhalmi .daniel@univet .hu)

SAMPLE

Weekly schedule of seminar	
Week	Seminars
1 .	Cereals
2 .	Pulse crops and oil plants
3 .	Forage legumes and fleshy forages

4 .	Poisonous plants containing cardiac glycosides or HCN
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Teacher(s) take part in teaching: Dr . Péli Evelin (Peli .Evelin .Ramona@univet .hu), Kutszegi Gergely (Kutszegi .Gergely .Jozsef@univet .hu)

Aim of subject:

The general task of the subject to explain the Plant Kingdom related to the veterinarian science . Students can study about the major crop and poisonous plants, their constructing cells and tissues, nutrients and secondary metabolites and their major physiological processes as well . The subject also deals with grassland habitats as it's a major source of forage .

Mandatory literature: Lecture slides

Recommended literature:

1 . Horváth, Zs . - Vetter, J .: Applied botany for Veterinary Students . SZIE AOTK, Budapest, 2003 . 2 . Frohne, D . - Pfander, H .J .: Poisonous Plants . Manson Publishing Ltd London, UK 2005 .

Note: Our students can practice and study all botanical preparatives (seeds, herbarium sheets, grasses, cereals) in the practical (study) room of the Department (Rottenbiller street 50, floor 1, room 7). **Opening hours:** M-Th: 8-16, Fr: 8-12 .

Subject of practicals in detail

5 .	Poisonous plants affecting the CNS
6 .	Poisonous plants with complex and other effects (lungs, digestive tract, liver, photosensitization) 1 .
7 .	Poisonous plants with other effects (carcinogenic, blood, mineral metabolism, nitrate cell division) 2 .
8 .	Poisonous garden and indoor plants
9 .	Medicinal plants
10 .	Grasslands
11 .	Botanical hay analysis
12 .	Visiting the the botanical garden 'Füvészkert'
13 .	Analysis of stomach/rumen contents
14 .	Retake week

GUIDE TO CHEMISTRY

for Students of Veterinary Faculty

2017/2018 winter term

TEACHING STAFF

Dr . Zoltán VINCZE Associate Professor; Head of Department

Dr . Péter NEMES Professor

Dr . Pál SCH EIB ER Professor Emeritus

Dr . Tamás R . VARG A Associate Professor Dr .

Mihály V . PILIP ECZ* Lecturer

*Correspondent teacher for the English-groups .

The subject of **Chemistry** contains overall 30 lectures and 30 laboratory practicals in Winter-term . Participation in the **laboratory practicals** is **compulsory** and the attendance will be **recorded each** time . In case of more than **three** absences the lab course will not be acknowledged . Participation in the **lectures** is also **compulsory** the attendance will be checked regularly . Students having more than **three uncertified** missed lectures **do not** receive a **signature** in Chemistry, and they are **not** entitled to sit the end-of-term examination in December-January .

TEXTBOOKS AND LAB MANUAL

Any recent Chemistry textbooks of college or higher level can be used (e .g . Raymond Chang: Chemistry, McGraw-Hill Inc ., 1991; ISBN 0-07-010518-9) . The use of **Chemistry Laboratory Manual** is prescribed because this Manual serves as the laboratory protocol, as well . It can be purchased for **2,000 HUF** at the first laboratory practical. The free electronic (pdf) version of the lecture slides can be downloaded from the **Intranet** after username/password login.

PARTICIPATION IN THE LABORATORY TRAINING

The duration of each practical is 2×45 min ., and they will be held without breaks:

Monday, 8:15 - 9:45 for groups **5, 6**

Monday, 10:15 - 11:45 for groups **3, 4**

Monday, 14:15 - 15:45 for groups **7, 8**

Tuesday, 10:15 – 11:45 for groups **1, 2** **Tuesday, 15:15 – 16:15** for groups **9, 10**

at the Student Laboratory (ground floor, room No. 8) of the Department. The individual workplace of students in the Laboratory is optional but it **should be kept** during both Terms . Participation in **laboratory exercises** will be **not** allowed **without** a **lab coat**, **Manual** and **safety goggles** (provided in the lab) . In case of missed lab exercise(s) due to **documented** illness or serious family issue, the student has to take **make up lab(s)** the last week (**Dec . 11 -15**) of Winter-term 2017 .

PREPARATION FOR LAB EXERCISES

The goal of laboratory practices is to perform experiments and demonstrations in the laboratory, which will provide empirical evidence for the factual knowledge obtained from the **theoretical lectures** . A thorough theoretical preparedness is needed for a successful practical laboratory work . Before the chemistry lab class it is important to review the relevant chapters of the lecture(s)/ textbook(s) of chemistry, and to study the extensions found in the Manual . Supervisors **might check** the preparedness and work of the students during

the lab exercises . In case of **unsatisfactory** preparedness the given practical will **not** be **accepted**, therefore it should be **repeated** in the same week **or** as a make up lab .

Each laboratory experiment should be done **individually** (except for demo-, and group-experiments) and should be **started** right after the introduction. The **observations** and **experimental data** should be **instantly** documented after the given experiment on the odd pages of the Manual. However, writing the **reaction equations** and **calculations** in the Manual, **before** (at home) the given lab practical is **highly** recommended . At the end of the practical, the students have to **clean** the used lab-tools and **set back** the reagents to their original place . Before leaving the laboratory students have to get a valid **signature** of attendance from a supervisor in the Manual .

For the **make-up lab** last week one should fill (copy) and **learn** the missed lab(s) in the Manual and (s)he will be asked few short, theoretical questions from the missed lab(s) . If they are properly answered then one can get the valid signature(s) for the missed lab(s) .

REQUIREMENTS

1 . Midterm Tests. During the term all students are obliged to perform **two** written **tests** (60 min ./ test), whose subject includes the **topics** of the **laboratory exercises** and the **related lectures** .

Test 1: Nov . 07, 7:00 Chemical calculations (stoichiometry) (15 points)

Test 2: Nov . 28, 7:00 pH calculations (15 points)

The tests **cannot** be later upgraded . **Only** those students who **missed** the midterm test(s) due to documented illness are obliged to write a **make-up test(s)** on December 12th at 13:15 . The make-up test(s) topics include the subjects of the missed test(s) . The results of any test will be announced within **3 working days** from the writing date . Smartphones, **graphic** calculators, netbooks, tablets and other **text storage** electronic devices are **not allowed** to use during the tests/exams . Cheating, plagiarism or use the above mentioned devices are **not** tolerated (**0** point), and the incidence will be promptly reported to Department of Student Affairs.

2 . Titrations. The submitted results of two titrations (i . e . analytical determination of mass-concentrations of NaOH and FeSO₄) in exercises No . 10 - 11 will be evaluated with 0 - 5 points/ titration (0 - 10 points overall) .

3 . End-of-term Examination. The Winter-term has to be closed with a 120 min . **written examination** with **100** points, which includes **all** subjects of lectures **and** laboratory exercises (**General-**, and **Inorganic** Chemistry) **except** calculations .

The **Chemistry exams** will be held on: **December 19th 2017, January 3rd, 17th, and 30th 2018** from **14:00** at **Chemistry Lecture Hall** .

The **grade** will be determined by the **sum** of points from the **midterm-**, and **lab tests**, and **examination** (**140** points overall) as follows:

Points	Grade
0 - 69	unsatisfactory (1)
70 – 87	pass (2)
88 – 104	fair (3)
105 – 122	good (4)
123 - 140	excellent (5)

To help the study **consultations** will be organized according to the agreement with the students . The consultation is not a simple repetition of the lectures but it can give help to understand the difficult parts of the subject and guidelines in preparation for the midterm tests. The exact date of these sessions will be announced in time .

SCHEDULE OF LECTURES AND PRACTICALS OF WINTER-TERM 2017

Week	Lecture	Practical
Sept . 11 – 15	Introduction Inorganic chemistry . Periodic table Atomic Structure, Atom models Basic principles of wave mechanics	Lab I: Introduction
Sept . 18 – 22	Molecular orbitals . Exeptions to the octet rule . Electronegativity . Polar covalent bonding . Molecular geometry . Intermolecular attractions	Lab II: Basic laboratory techniques 1
Sept . 25 – 29	Reaction equations . Hydrogen . Halogens . Covalent bond . Halo compounds . Oxygen, oxides, oxyacids	Lab III: Basic laboratory techniques 2
Oct . 02 – 06	Sulfur and S-compounds . Nitrogen and N- compounds . Phoshorus and P-compounds . Carbon, silicon, and their compounds . Metals and their compounds .Complexes .	Lab IV: Inorganic chemistry 1
Oct . 09 – 13	States of Matter	Lab V: Inorganic chemistry 2
Oct . 16 – 20	Solutions	Lab VI: Inorganic chemistry 3
Oct . 23 – 27*	Reaction kinetics . Homogenous and heterogeneous equilibria	Lab VII: Rate of chemical reactions;
Oct . 31 – Nov . 04*	Acid-base equilibria	Seminar 1 (no manual work)
Nov . 07 – 11	Buffers. Hydrolysis of salts	Lab VIII: Chemical equilibria
Nov . 14 – 18	Chemical thermodyn . 1st law . Enropy . Spontaneous proc . Gibbs free energy, 2nd law, chem . Thermodyn . And equilibria	Lab IX: Acid-base equilibrium .
Nov . 21 – 25	Electrochemistry	Lab X: Titration I. (acidialkalimetry)
Nov . 28 – Dec . 02	Colloids	Lab XI: Titration II: (redoximetry)
Dec . 05 – 09	Colloids . Methods of Chromatography I .	Lab XII: Preparation and properties of colloids
Dec . 12 – 16	Methods of Chromatography II .	Lab XIII: Make-up lab

HISTOLOGY I. LECTURES AND PRACTICALS

First semester, 2016/2017

Ist year

Week	Lecture	Practical
09 .12 .-09 .16	Introduction . History of histology	Introduction
09 .19 .-09 .23	Histotechnics . Electron microscope	The light microscope
09 .26-09 .30	Epithelial tissues I	Special microscopes

10 .03 .-10 .07	Epithelial tissues I	Microtechnics
10 .10 .-10 .14	Epithelial tissues II .	Electron microscope
10 .17 .-10 .21	Connective tissues I .	Surface epithelia
10 .24 .-10 .28	Connective tissues II .	Glandular epithelia
10 .31 .-11 .04	Supportive tissues	Connective tissues I .
11 .07 .-11 .11	Osteogenesis	Connective tissues II .
11 .14 .-11 .18	Muscle tissues	Supportive tissues
11 .21 .-11 .25	Neural tissue I .	Muscle tissues
11 .28 .-12 .02	Neural tissue II .	Neural tissue
12 .05 .-12 .09	Blood . Hematopoiesis	Blood cells
12 .12 .-12 .16	Blood vessels	Catch-up practical

Budapest, 2016-09-08

*Prof. Katalin Halasy***HISTOLOGY II.****Subject of lectures in detail**

Week	Lecture
03 .-07 . February	General Histology of Organs, Lymphatic organs
10 .-14 . February	Digestive system
17 .-21 . February	Digestive system
24-28 . February	Digestive system
03 .-07 . March	Respiratory organs
10 .-14 . March	Urinary Organs
17 .-21 . March	Male genital organs
24 .-28 . March	Female genital organs
31 .-04 . April	Endocrin organs
07 .-11 . April	Central nervous system
14 .-18 . April	-----
21 .-25 . April	Sensory organs
28 .-02 . May	Outer integument (skin)
05 .-09 . May	Mammary gland . Avian organs I .
12 .-16 . May	Avian Organs II .

Subject of practicals in detail

Week	Practical
03 .-07 . February	-----
10 .-14 . February	Immune system I .
17 .-21 . February	Immune system II .
24-28 . February	Digestive system
03 .-07 . March	Digestive system
10 .-14 . March	Digestive system
17 .-21 . March	Digestive system
24 .-28 . March	Respiratory organs, Urinary Organs
31 .-04 . April	Male genital organs
07 .-11 . April	Female genital organs
14 .-18 . April	-----
21 .-25 . April	Endocrin organs, Central nervous system
28 .-02 . May	Sensory organs
05 .-09 . May	Skin, Mammary gland, Avian Organs
12 .-16 . May	Catch-up practical

INFORMATICS

Subject of lectures in detail

1 . week	Introduction, word processing
2 . week	Word processing
3 . week:	Word processing
4 . week	Word processing, Zotero
5 . week	Presentations
6 . week	Spreadsheets
7 . week	Spreadsheet editor vs . statistical program
8 . week	Advanced Excel functions
9 . week	Advanced Excelm functions - Viruses, worms, social engineering
10 . week	Viruses, worms, social engineering
11 . week	Viruses, worms, social engineering
12 . week	Graphics
13 . week	Graphics

14 . week	Graphics
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Subject of practicals in detail

1 . week	Windows
2 . week	Word
3 . week	Word
4 . week	Word
5 . week	Word
6 . week	Word test
7 . week	PowerPoint
8 . week	Excel
9 . week	Excel
10 . week	Excel
11 . week	Excel
12 . week	Excel
13 . week	Excel
14 . week	Excel test
15 . week	Re-take

VETERINARY- AND FOOD CHEMISTRY
SPRING-TERM 2017/18

LECTURES

Topics of the lectures (Thursday 8¹⁵ - 9⁰⁰ and Friday 8¹⁵ - 10⁰⁰ for groups 1-6; Monday 14¹⁵ – 16⁰⁰ and Wednesday 9¹⁵ – 10⁰⁰ for groups 7-10) are given as follows:

February 5 – 9	Aliphatic and aromatic hydrocarbons .
February 12 – 16	Alkyl halides, Aryl halides . Aliphatic alcohols .
February 19 – 23	Phenols, aromatic alcohols, quinones . Ethers . Aliphatic amines .
February 26 – March 2	Amines and other N-comp . Aliphatic and aromatic carbonyl comp .
March 5 – 9	Carboxylic acids and derivatives . Carbonic acid derivatives . Stereoisomerism .
March 12 – 16	Steroids, terpenes, carotenoids, heterocycles, alkaloids .
March 19 – 23	Nucleic acids . Carbohydrates .
March 26 – 30	Spring break
April 2 – April 6	Amino acids, peptids, proteins .

April 9 – 13	Biomaterials in medicine .
April 16 – 20	Food Additives: Thickening Agents, Gel Builders, Stabilizers .
April 23 – 27	Food Additives: Preservatives, Antioxidants .
April 30 – May 4	Chemistry of Color Food Colors .
May 7 – 11	Aroma Substances, Flavor Enhancers, Sweeteners .
May 14 – 18	Analytical Methods in Food Chemistry . Food Contamination .

Participation in the **lectures** is also **compulsory** the attendance will be checked (random) . Students having more than **three uncertified** missed lectures **do not** receive a **signature** in VETERINARY- AND FOOD CHEMISTRY, and they are **not** entitled to sit the end-of-term examination in May/June . The electronic (pdf) version of the **lecture** slides can be downloaded from the the **Intranet** after username/password login. Recommended textbooks for the Spring-term:

R. C. Atkins, F. A. Carey: ORGANIC CHEMISTRY, International Edition (McGraw- Hill Publishing, Company, 1990, ISBN 0-07-100667-2)

H.-D. Belitz, W. Grosch, P. Schieberle: FOOD CHEMISTRY, 4th Edition (Springer-Verlag Berlin Heidelberg 2009, ISBN 978-3-540-69933-0)

Laboratory Exercises

Exercise 1:	February 6 - 8	Acidi-Alkalimetry, Complexometry .
Exercise 2:	February 13 – 15	Potentiometric titration
Exercise 3:	February 20 - 22	Organic Chemistry Practice 1
Exercise 4:	February 27 - March 1	Organic Chemistry Practice 2
Exercise 5:	March 6 – 8	Organic Chemistry Practice 3
Exercise 6:	March 13 – 14	Seminar I .
Exercise 7:	March 20-22	Organic Chemistry Practice 4
	<i>March 26 – 30</i>	<i>Spring break</i>
Exercise 8:	April 3 – 5	Organic Chemistry Practice 5
Exercise 9:	April 10 – 12	Organic Chemistry Practice 6
Exercise 10:	April 17- 19	Organic Chemistry Practice 7
Exercise 11:	April 24, 26	Chromatography
Exercise 12:	May 2 - 4	Seminar II .
Exercise 13:	May 8 - 10	Isolation of Caffeine.
Exercise 14:	May 17, 17	Make-up labs

Laboratory manual is *Dr. P. Scheiber, Dr. P. Nemes, Dr. T.R. Varga, Dr. Z. Vincze, and Dr. M.V. Pilipecz: Veterinary and Food Chemistry Laboratory Manual* . Its use is prescribed; this manual serves as the laboratory protocol, as well. It can be purchased for 1,500 HUF in the first week of the semester.

The laboratory exercises (2x45 min .) will be held without breaks for groups of:

7, 8	on	Tuesday,	8:15 – 9:45
5, 6	on	Tuesday,	14:15 – 15:45
3, 4	on	Tuesday,	16:15 – 17:45
1, 2	on	Thursday,	10:15 – 11:45

in Student Laboratory (HALLGATOI LABOR) of Chemistry Department (No. 8 at ground floor in bldg . C) .

WORK IN THE LABORATORY

1 . Participation on each **laboratory practical** is **compulsory** and the attendance will be **recorded each** time . Students who are unable to take the laboratory exercise(s) are obliged to give a satisfactory oral review of the subject(s) missed during their **excused** absence (**make-up lab**) . Students who missed more than three labs, have to re-take entire Veterinary and Food Chemistry course (with a new, **unfilled** Lab Manual) from February, 2019 .*

For the make-up lab (Exercise 14) one should fill (copy and learn) all the missed lab(s) in the Manual and (s)he will be asked a few short questions from the missed lab . If they are properly answered then one can get the valid signature(s) for the missed lab(s) . Note: the exam is not allowed with a missed lab exercise(s) .

2 . **A thorough theoretical preparation is required to a successful laboratory work!** Therefore, a precise study of the related section of the laboratory manual and the thematically relevant chapters of the lecture **prior** each laboratory exercise is a **must** . The preparedness of students **can be checked** at any time during the lab course and an **unsatisfactory** result will be considered as a **missed** lab exercise .

3 . Wearing an **apron** (lab coat) and **safety goggles** is compulsory in the laboratory. At the first exercise every student has to choose a permanent place at one of the lab desks . The laboratory experiments should be done **individually** (except group-experiments) . The observations, experimental data, and answers to the questions should be documented instantly in the Manual in the course of the laboratory exercises . However, it is highly advisable to write the reaction equations in the Manual prior the given lab (at home). The right-hand pages of the Manual are left for that purpose. At the end of the exercise the students have to **clean** the glass vessels and other tools and set back the reagents' flasks of to their place. Before leaving the laboratory students have to get a valid **signature** in the Manual from the supervisor .

In order to help the students' work **consultations** can be organized . Dates of the consultations will be announced later, as agreed with the students . The consultation is not a simple repetition of the given subject but it can assist to its better understanding .

REQUIREMENTS

Midterm Test

A **midterm test** (45 min .) should be written in the spring-term on

March 22, 7:15 Chemistry of functional groups (**20** points)

Students who **missed** the midterm test due to illness (the medical certificate must be shown to *Dr. M. V. Pilipecz* within **7 days** after recovery) will have **one** chance to write **make-up** test on **May 15, at 18:00** . Further possibilities for the retake will be **not** given . The results of tests will be known for the students in 3 days from the writing date . Smartphones, graphic calculators, netbooks, tablets and other text storage electronic devices are not allowed to use during the tests/ exams . Cheating, plagiarism or use the above mentioned devices are not tolerated (0 point), and the incidence will be promptly reported to Department of Student Affairs. The written test is evaluated on a 0-20 point scale and these points will be added to the final exam's points.

* Since it has financial consequence therefore, please contact with *Mr Péter Lessi* at Department of Student Affairs.

EXAMINATION

At the end of the spring-term the students have to **write** an end-of-term **examination**, which comprises **all subjects** of **lectures** and **laboratory exercises** of the spring-term . Duration of the exam is **120** minutes and it is evaluated on a **100** point grading system . In the exam there are no calculation exercises therefore **only** the use of an approved periodic table and ballpoint pen (with blue- or black ink) are allowed . Cheating or plagiarism in any form is **not tolerated** (**0** point), and the incidence will be promptly reported to Department of Student Affairs.

The final **grade** of the terms will be determined by the **sum** of points from the **midterm test** and the **Veterinary and Food Chemistry exam** ($20 + 100 = 120$ points = 100 %), as follows:

0 – 59	(0 – 49 %)	<i>unsatisfactory (1)</i>
60 – 74	(50 – 62 %)	<i>pass (2)</i>
75 – 89	(63 – 74 %)	<i>fair (3)</i>
90 – 104	(75 – 87 %)	<i>good (4)</i>
105 – 120	(88 – 100 %)	<i>excellent (5)</i>

The **Veterinary and Food Chemistry exams** will be held on

May 23nd **May 30th** **June 13th** **June 27th** from **14:00** at **Chemistry Lecture Hall** .

Please, be there 10 minutes *before* the exam at 13:50 .

Budapest, February 1, 2018 .

Dr. Zoltán Vincze, Head of Dp

SAMPLE

ZOOLOGY

Subject:	Zoology
Specialization:	Veterinary medicine
Term of the subject:	I . semester
Number of lectures/semester practicals/semester	Lectures/30
Credit:	2
Prerequisites:	-
Name of Department:	Department of Anatomy and Histology
Responsible teacher (email):	Dr . Sándor Hornok (Hornok .Sandor@aotk .szie .hu)
Teacher(s) take part in teaching:	Dr . Róbert Farkas, Dr . Gábor Földvári
Aim of subject:	to prepare students for parasitology and other subjects
Weekly schedule of lectures	
1 . Week	Introduction . General zootaxonomy . Major taxa of Kingdom Animalia .
2 . Week	Protozoa („Sarcocystidophora”, Apicomplexa, Ciliophora, Microspora)
3 . Week	Porifera, Myxozoa, Cnidaria, Platyhelminthes
4 . Week	Nematoda, Annelida, Mollusca
5 . Week	Vertebrata I . („Pisces”, Amphibia)
6 . Week	Vertebrata II . (Reptilia, Aves)
7 . Week	Vertebrata III . (Mammalia)
8 . Week	Arthropoda I . (Myriapoda, Chelicerata)
9 . Week	Arthropoda II . (Hexapoda I .)
10 . Week	Arthropoda III . (Hexapoda II .) Echinodermata Microevolution
11 . Week	Macroevolution, speciation . Evolution of infectious agents
12 . Week	Basic terms in ecology . Population ecology
13 . Week	Community, ecosystem, biosphere
14 . Week	Ethology
15 . Week	Consultation for exam
Recommended literature	
Obligatory:	lecture notes, Power Point presentations of lectures on the website of the department
Recommended:	
Type and method of exam:	
Written exam .	
Note(s):	

2ND YEAR

SAMPLE

AGRICULTURAL ECONOMICS

Subject:		Agricultural Economics
Specialization:		Veterinary medicine
Term of the subject:		3
Number of lectures/semester practicals/semester		Lectures/30
Credit:		2
Prerequisites:		-
Place of lectures/ semesters, practicals		Surgery lecture-hall, Thursday 8 .15-9 .45
Name of Department:		Department of State Veterinary Medicine and Agricultural Economics
Responsible teacher (email):		Dr. Ózsvári László (ozsvari.laszlo@aotk.szie.hu)
Teacher(s) take part in teaching:		
Aim of subject:		To gain information about the major indices and mechanisms of the agricultural economy, especially the animal breeding from the view of veterinarians
Week	Weekly schedule of lectures	Name of teacher
1 . (IX . 10 .)	General introduction . Introducing the economic way of thinking . Resources	Dr. László Ózsvári
2 . (IX . 17 .)	Production possibilities, opportunity cost, economic growth	Dr. László Ózsvári
3 . (IX . 24 .)	Agricultural market demand and supply	Dr. László Ózsvári
4 . (X . 01 .)	Agricultural markets in action . Consumer choice theory	Dr. László Ózsvári
5 . (X . 8 .)	Price elasticity of demand and supply .	Dr. László Ózsvári
6 . (X . 15 .)	Agricultural yield and production costs	Dr. László Ózsvári
7 . (X . 22 .)	Farm budget and business analysis	Dr. László Ózsvári
8 . (X . 29 .)	Economic aspects of food of animal origin	Dr. László Ózsvári
9 . (XI . 05 .)	Main economic aspects of forage crops	Dr. László Ózsvári
10 . (XI . 12 .)	Main economic aspects of milk production	Dr. László Ózsvári
11 . (XI . 19 .)	Main economic aspects of the beef sector	Dr. László Ózsvári
12 . (XI . 26 .)	Main economic aspects of the poultry sector	Dr. László Ózsvári
13 . (XII . 03 .)	Main economic aspects of the swine sector	Dr. László Ózsvári
14 . (XII . 10 .)	Main economic aspects of the sheep and goat sector	Dr. László Ózsvári
15 . (XII . 17 .)	Basics of macroeconomics	Dr. László Ózsvári

Recommended literature	
Obligatory:	Subject matters given by the lecturers .
Recommended:	Tucker, I .: Economics for Today . Thomson-South-Western, 2005
Type and method of exam:	
Written exam .	
Grading scheme:	
≤60% - fail (1) 71-80% - passing (2) 61-70% - satisfactory (3) 81-90% - good (4) 91-100% - excellent (5)	
Note(s):	
The subject is prerequisite for the Animal Health Economics, management and ethics	

SAMPLE

ANATOMY

2017/2018 3rd Semester

	Lectures	Plenary	Labs
1. 09 . 11-15 .	Lymphatic system	Lymphatic system	Semester Information
2. 09 .18-22 .	The neuron principle: morphological basis of neural function . The development of the nervous system	Lymphatic system	Lymphatic system
3. 09 .25-29 .	Brachial plexus	Brachial plexus	Brachial plexus
4. 10 .02-06 .	Lumbosacral plexus	Lumbosacral plexus	Lumbosacral plexus
5. 10 .09-13 .	Cranial nerves	Cranial nerves	Cranial nerves
6. 10 .16-20 .	Cranial nerves	Cranial nerves	Cranial nerves
7. 10 .23-27 .	Cranial nerves	Cranial nerves	Cranial nerves
8. 10 .30-11 .03 .	Cranial nerves	Cranial nerves	Cranial nerves
9. 11 .06-10 .	Autonomous nervous system	Autonomous nervous system	Autonomous nervous system
10. 11 .13- 17 .	Brain	Brain	Dissection of final topics I .
11. 11 .20- 24 .	Brain	Brain	Dissection of final topics II .
12. 11 .27- 12 .01 .	Brain	Brain	Brain
13. 12 .04- 08 .	Tracts and blood supply of the spinal cord, Visual organ	Meninges and blood supply of the CNS, circulation of the CSF	Dissection of final topics III .
14. 12 .11- 15 .	Hoof, mammary gland	Hoof, mammary gland	Dissection of final topics IV .

Prof. Dr. Péter Sótonyi

APPLIED ETHOLOGY 1+2 (2015/2016)

1st semester (Applied Ethology 1)

Subject of lectures in detail

Date	Theme of the lecture
September 11	Introduction to the discipline: Veterinary Applied Ethology . Short history and objectives . Ethical aspects of animal production
September 18	Behaviour genetics, evolution and domestication . Behaviour and physiology .
September 25	Motivation and the organisation of behaviour . General characteristics of innate behaviour. Learning and cognition, modifications of innate behaviour.
October 2	Social and reproductive behaviour .
October 9	Abnormal behaviour, stress and welfare . Human-animal relations .
October 16	General characteristics of behaviour of sheep . Connection between behaviour and housing .
October 23	National public holiday .
October 30	Behavioural traits of the cattle . I . General characteristics .
November 6	Behavioural traits of the cattle II. Influence of the management technology on the behaviour of dairy cattle . Abnormal behaviour of cattle .
November 13	Behavioural traits of the pig
November 20	Connection between management technologies and behaviour of the pigs . Behavioural disorders of pigs .
November 27	Behavioural traits of the domestic fowl . Correlation between behavioural requirements and housing and nutrition in poultry production (I)
December 4	Correlation between behavioural requirements and housing and nutrition in poultry production (II)
December 11	Behavioural traits of the domestic rabbit . Correlation between behavioural requirements and housing and nutrition .
December 18	General characteristics of behaviour of goat . Connection between behaviour and housing .

2nd semester (Applied Ethology 2)

Subject of lectures in detail

Date	Lecturer	Theme of the lecture
February 11	A . Adorján	Behavioural traits of the dog I .
February 18	A . Adorján	Behavioural traits of the dog II .
February 25	A . Adorján	Behavioural traits of the dog III .
March 3	A . Adorján	Behavioural traits of the dog IV .
March 10	A . Adorján	Behavioural traits of the cat I .

March 17	A . Adorjan	Behavioural traits of the cat II .
March 31	A . Adorjan	Behavioural traits of the cat III .
April 7	A . Adorjan	Behavioural traits of the cat IV .
April 14	A . Adorjan	The role of the ethology in the everyday small animal practice . Practical aspects .
April 21	V . Jurkovich	Efficient livestock handling
April 28	E . Losonczi	Behavioural traits of the horse I . Basics
May 5	E . Losonczi	Behavioural traits of the horse II . Time budget, locomotion, communication .
May 12	E . Losonczi	Behavioural traits of the horse III . Social and reproductive behaviour .
May 19	E . Losonczi	Behavioural traits of the horse IV . Abnormal behaviour and horse welfare .

BASICS OF CLINICAL EXAMINATION AND CLINICAL CARE

Information about the subject and its requirements

(This document and further teaching materials for the subject can be found on the students' website of the Department and Clinic of Internal Medicine:

To approach this homepage go to the homesite of the department (Department and Clinic of Internal Medicine) at <http://www.univet.hu> , then find the menu 'Download page for lecture notes and teaching materials' (left bar), username: imedlecturenotes, password: belgyo

Title of subject: Basics of clinical examination and clinical care

Credit: 1

Teaching hours: 15 hours/term

Term: 3

Language: English

There will be one entry in the study record books (black books) signed by Dr . Vörös, Károly

Prerequisites:

- first semester (*small credit*) exam in Zoology
- second semester (*small credit*) exam in Anatomy
- successful completion of Physiology during the 2nd term, practical grade

Responsible teacher for education of the subject: Dr. Éva Balogh (Balogh.Eva@aotk.szie.hu), chief clinician, Department and Clinic of Internal Medicine .

Objective of training: To supply veterinary students with the basics of clinical practice during the core curriculum .

Types of teaching:

- 2×1 .5-hour plenary workshops (small animal and large animal) at the beginning of term 3: - Hungarian 2nd year: Monday, 08 . September from 14 .15 to 17 .00 p .m . - English 2nd year: Monday, 15 . September from 14 .15 to 17 .00 p .m .

small animal topics: Dr. Balogh Éva (Balogh.Eva@aotk.szie.hu), large animal topics: Dr . Kutasi Orsolya (Kutasi .Orsolya@aotk .szie .hu)

Location: Lecture Hall of Internal Medicine (Building “O”)

Attendance at plenary workshops is compulsory and it is a prerequisite for performing the subject . Students who are not able to attend the workshops for reasons beyond their control are required to attend subsequent training and take a preliminary written test on the material of the plenary workshops before they can start their clinical practice. To do this, please contact Dr. Balogh Évia via email .

- 2 clinical tours (1 small animal and 1 large animal) at SZIE ÁOTK clinics, (for those who are volunteer for this tour) . Further details will be sent later .

Clinical teachers in charge of the tours:

Small Animal Clinic: Dr. Balogh Éva(Balogh.Eva@aotk.szie.hu)

Large Animal Clinic: Dr . Kutasi Orsolya (Kutasi .Orsolya@aotk .szie .hu), Dr . Bakos Zoltán (Bakos .Zoltan@aotk .szie .hu)

Transportation to Üllő:

The Large Animal Clinic (Location: Üllő, Dóra major) can be approached by buses organized by the Secretariat of Education of the Faculty . The schedule of the bus service can be seen on the information board at the student entrance of the Lecture room of Internal Medicine („Building „O”).

Subject outline:

- Introduction to and practical demonstration of work safety regulations .
- Fire- and property protection regulations relating to students during their work at the clinics .
- Rules of handling domestic animals with special regard to the risk of biting and scratching, and the duties in case of such accidents (administrative rules) .
- Restraining animals for patient examination and for common medical interventions .
- Taking clinical basic values: body temperature, pulse rate, respiratory rate .

Grading:

Small credit exam (with grades: accepted, excellent, not accepted) .

Accepted: certified participation in the plenary workshops.

Excellent: certified participation in the plenary workshops and taking part in both clinical tours and passing a written test based on the material of plenary workshops with at least 80% result in the exam period on exam days offered by the Department of Internal Medicine (the test includes large and small animal questions) .

No excellent grade can be reached for those students who do not attend the plenary workshops on 15 .09 .2014 . (see above) .

Teaching materials:

Lecture notes of the plenary workshops in Acrobat Reader (PDF) format is found on the home page of the Department of Internal Medicine .

Budapest, 2014 . 08 . 28 .

*Dr. Éva Balogh chief clinician
responsible teacher for the subject*

BIOMATHEMATICS

Last change: 23 .02 .2017 17:48

Course	Biomathematics
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	2/2
Credits	3
Lectures	15 lessons/semester
Practical lessons	30 lessons/semester
Specialization	veterinary (English)
Department	<u>Department of Biomathematics and Informatics</u>

Description

The aim of this course is to prepare you for an understanding of the basic statistical methods that are useful in your major field. Concepts are introduced in an intuitive way. The relevance of the procedures is demonstrated by examples selected from a wide area of life sciences . The course uses a common-sense approach to explain basic ideas and methods . Real-life examples show how each idea or method is applied in practice .

Practicals, dates, locations, instructors and their email addresses:

Group 1: Fri. 10:15, H1 - PÁSZTORY-KOVÁCS, Szilvia - Kovacs.Szilvia (at) univet.hu

Group 2: Thu. 14:15, H1 - LANG, Zsolt - lang.zsolt (at) univet.hu

Group 3: Fri. 08:15, H1 - ABONYI-TÓTH, Zsolt - abonyi-toth.zsolt (at) univet.hu

Group 4: Tue. 14:15, H2 - PIROSS, Imre Sándor - sandor.piross (at) gmail.com

Group 5: Fri. 08:15, H2 - PÁSZTORY-KOVÁCS, Szilvia - Kovacs.Szilvia (at) univet.hu

Group 6: Fri. 12:15, H2 - KÖVÉR, Szilvia - Kover.Szilvia (at) univet.hu

Group 7: Tue. 10:15, H1 - PIROSS, Imre Sándor - sandor.piross (at) gmail.com Group 8: Fri.

10:15, H2 - KÖVÉR, Szilvia - Kover.Szilvia (at) univet.hu

Recommended literature:

Wassertheil-Smoller: Biostatistics and Epidemiology . A Primer for Health and Biomedical Professionals, Springer, 1990, 1995, 2004 . (It can be borrowed from the University Library .)

Subject of lectures in detail

1 . week	Introduction . Descriptive and inferential statistics . Population and sample . Data types . Probability theory and statistics . Sample mean, median, lower and upper quartiles, range, variance, standard deviation .
2 . week	Probabilities and statistics. Popper's theory of falsification. Hypothesis testing, H0, H1. Clinical relevance and statistical significance. The p-value. Student's t-test, Mood's median test, Wilcoxon's rank sum test . Components of a statistical test .
3 . week	Probability theory . The notion of probability . Classical probability formula . Elementary and composite events . Relative frequency . Law of large numbers . Conditional probability and independence . Odds, logit, odds ratio and relative risk .

4 . week	Random variables, probability distributions . Discrete and continuous distributions . Density function, histogram, boxplot . Symmetric, skewed, unimodal, bimodal and multimodal distributions . Binomial, Poisson and normal distribution . Central limit theorem . Expected value, population variance and standard deviation . Independence of random variables .
5 . week	Hypothesis tests . One-sample, two-sample, multiple sample tests . Paired sample tests . One-sided and two-sided problems . Type I error, Type II error, power . Parametric tests: t-tests, F-test, Levene test, ANOVA . Nonparametric tests: sign test, Mood's median test, Wilcoxon's signed rank test, Mann-Whitney U-test, Kruskal-Wallis test .
6 . week	Analysis of qualitative data: Chi-square test, Fisher's exact test, goodness of fit test, test of independence, homogeneity test . Binomial test . Multiple testing, Bonferroni-Holm correction .
7 . week	Applications of probability theory in epidemiology . Theorem of total probability . Diagnostic tests. Prevalence, sensitivity, specificity, positive and negative predictive values . Bayes' theorem . Observed and true prevalence .
8 . week	Estimation . Point estimate, interval estimate . Plug-in estimate . Standard error, confidence interval. Relationship between statistical tests and confidence intervals. Equivalence tests .
9 . week	Correlation, regression . Simple and multiple linear regression . Estimation of parameters . Testing hypotheses on regression . Model diagnostics .
10 . week	Analysis of variance (ANOVA) . One-way ANOVA . Decomposition of variance . Multiway ANOVA . Model diagnostics .
11 . week	Variance-covariance analysis (ANCOVA) . Factors and covariates . Dummy variables . Interactions. Model diagnostics. Confidence bands and prediction bands.
12 . week	Design of experiments . Randomised block design . Multiple testing . Bonferroni-Holm correction . Multiple comparisons . Tukey's test, Dunnett's test . Nonparametric or distribution-free methods .
13 . week	Logistic regression . Odds ratio . Generalised linear model . The method of maximum likelihood .

Subject of practicals in detail

1 . week	R-commander, entering data, data manipulation, descriptive statistics
2 . week	Loading data . Charts .
3 . week	Charts .
4 . week	Binomial and Poisson distribution .
5 . week	Normal distribution .
6 . week	Binomial test, t-test, F-test, Levene test .
7 . week	Midterm .
8 . week	Contingency table, chi-square test, Fisher's exact test .
9 . week	Correlation, linear regression .
10 . week	ANOVA, ANCOVA .
11 . week	ANOVA, ANCOVA .

12 . week	ANOVA, ANCOVA .
13 . week	Midterm .

SAMPLE

INFORMATICS

Subject of lectures in detail Subject of

1 . week	ntroduction, word processing
2. week	Word processing
3. week	Word processing
4. week	Word processing, Zotero
5. week	Presentations
6. week	Spreadsheets
7 . week	Spreadsheet editor vs . statistical program
8 . week	Advanced Excel functions
9. week	Advanced Excelm functions - Viruses, worms, social engineering
10 . week	Viruses, worms, social engineering
11. week	Viruses, worms, social engineering
12. week	Graphics
13 . week	Graphics
14 . week	Graphics

practicals in detail

1 . week	Windows
2 . week	Word
3 . week	Word
4 . week	Word
5 . week	Word
6 . week	Word test
7 . week	PowerPoint
8 . week	Excel
9 . week	Excel
10 . week	Excel
11 . week	Excel
12 . week	Excel
13 . week	Excel
14 . week	Excel test
15 . week	Re-take

TOPOGRAPHIC AND APPLIED ANATOMY

Lectures / Plenary pract . (15 h)

	Wed 1-2PM (45')	Fri 3-5 PM (90')
1	11/02 horse- extremities	13/02 xxx
2	18/02 horse- extremities	20/02 horse- extremities, head
3	25/02 horse-head – plenary	27/02 horse-head, thorax
4	03/03 birds, rabbit - plenary	05/03 horse-abdomen
5	10/03 Ru/Ca-abdomen, thorax	12/03 Ru/Ca-abdomen, head
6	17/03 Ru/Ca-head	19/03 Ru - plenary
7	24/03 Ru/Ca-head, extr .	26/03 Ru/Ca-extremities

Practicals (30 h)

	Group 5+6 Tuesday 9-11AM	Group 3+4 Tuesday 2-4PM	Group 1+2 Friday 10-12AM
1	Xxx		Xxx
2	Xxx		Xxx
3	Xxx		27/02 horse-extr . (Kerepesi)
4	02/03 horse-extr . (Kerepesi)		05/03 birds, rabbit (anatomy)
5	09/03 birds, rabbit (anatomy)		12/03 horse-head (Kerepesi)
6	16/03 horse-head (Kerepesi)		19/03 abdomen, thorax (Kerepesi)
7	23/03 abdomen, thorax (Kerepesi)		26/03 ruminants (anatomy)
8	30/03 ruminants (anatomy)		Xxx
9	Xxx		Xxx
10	13/04 horse (Kerepesi)		16/04 horse (Kerepesi)
11	20/04 dog (anatomy)		23/04 dog (anatomy)
12	27/04 dog (alive)		30/04 dog (alive)
13	04/05 horse: catch-up (Kerepesi)		07/05 horse:catch-up (Kerepesi)
14	11/05 dog: catch-up		14/05 dog: catch-up
Sat!, 15/05 optional trip to the field station in Üllő (Ru/Eq)			

Kerepesi – stables at Kerepesi út 7 (other side of Keleti pu .)

Practical tasks for the exam in the subject

“Topographic and Applied Anatomy”

Five of the following structures have to be determined / localized in the living horse and dog, respectively:

Horse

- | | |
|---|---|
| <p>1 . Foramen infraorbitale</p> <p>2 . Foramen supraorbitale</p> <p>3 . Foramen mentale</p> <p>4 . Foramen mandibulae</p> <p>5 . Nasal opening of the nasolacrimal duct</p> <p>6 . Lingual process</p> <p>7 . Lymphnodes of the head</p> <p>8 . Salivary glands</p> <p>9 . Facial nerve</p> <p>10 Age “determination”</p> <p>11 . Borders of the paranasal sinuses</p> <p>12 . Pulse-taking</p> <p>13 . Guttural pouch</p> <p>14 . Wing of atlas</p> <p>15 . Thyroid cartilage</p> <p>16 . Thyroid gland</p> <p>17 . iv .-injection-sites</p> <p>18 . Heart</p> <p>19 . Caudoventral border of the lung</p> <p>20 . Site for the liver-biopsy</p> <p>21 . Ostium ileocaecale</p> <p>22 . Small intestine</p> <p>23 . Flexura pelvina</p> <p>24 . Xiphoid process</p> <p>25 .</p> | <p>34 . Spine of the scapula</p> <p>35 . Injection sites into the coffin joint</p> <p>36 . Injection sites into the pastern joint</p> <p>37 . Injection sites into the fetlock joint</p> <p>38 . Injection sites into the carpal joint</p> <p>39 . Injection sites into the elbow joint</p> <p>40 . Inj . sites into the shoulder joint</p> <p>41 . Inj . sites into the digital sheath</p> <p>42 . Inj . sites into the carpal sheath</p> <p>43 . Injection sites into the tarsal joint</p> <p>44 . Injection sites into the stifle joint</p> <p>45 . M . interosseus medius</p> <p>46 . M . flex . dig . supf . - forelimb</p> <p>47 . M . flex . dig . supf . - hindlimb</p> <p>48 . M . flex . dig . prof . - forelimb</p> <p>49 . M . flex . dig . prof . - hindlimb</p> <p>50 . Accessory ligament of the deep digital flexor</p> <p>51 . M . ext . dig . com . /longus</p> <p>52 . M . ext . carpi rad .</p> <p>53 . M . biceps brachii</p> <p>54 . Lacertus fibrosus</p> <p>55 . M . tibialis cran .</p> <p>56 . Patellar ligaments</p> <p>57 . Subiliac lymphnode</p> <p>58 . Trochanter major</p> <p>59 . Tuber coxae</p> <p>60 . Tuber ischiadicum</p> <p>61 . N . digit . palm .-block</p> <p>62 . High digital block</p> <p>63 . Distal metacarpal-block</p> <p>64 . Proximal metacarpal-block</p> <p>65 . N . medianus-block</p> <p>66 . N . ulnaris-block</p> <p>67 . N . tibialis-block</p> <p>68 . N . fibularis-block</p> |
|---|---|

Dog

- 1 . anulus inguinalis
- 2 . bladder
- 3 . canalis femoralis
- 4 . cardiac borders
- 5 . cardiac dullness
- 6 . carpus, puncture, tendons
- 7 . elbow (nerves, vessels)
- 8 . epidural anaesthesia
- 9 . fibula

- 10 . forearm skeleton, ligaments
11. hindlimb nerveblocks: fibularis, tibialis
- 12 . humerus, n . ulnaris, n . radialis
- 13 . kidneys
- 14 . large intestines
- 15 . laryngeal cartilages and the hyoid skeleton
- 16 . liver
- 17 . lung borders
- 18 . lymphnodes
- 19 . glands/lymphnodes of the head-neck region
20. m. ulnaris lateralis, m. flexor carpi ulnaris, digital flexors
- 21 . navel
- 22 nerve blocks: mentalis, infraorbitalis, alveolaris mandibularis, lingualis
- 23 . nerve blocks: radialis, ulnaris, medianus
- 24 . ovaries, uterus, vagina
- 25 . palpable features of the cervical vertebrae
- 26 . pelvis, trochanter
- 27 . retropharyngeal lymphnodes, thyroid, m . sternocephalicus, m . sternothyroideus, m . sternohyoideus
- 28 . salivary glands and the lymphnodes of the head-neck region
- 29 . shoulder joint, m . infraspinatus, m . deltoideus, m . biceps humeri
- 30 . small intestines
- 31 . spleen
32. stifle
- 33 . stomach
34. superficial cervical lymphnodes, scapula, v. jugularis externa
35. superficial muscles of the thigh
- 36 . trachea, esophagus, m . sternocephalicus, m . sternothyroideus, m . sternohyoideus 37 . xiphoid process, navel

VETERINARY GENETICS

Subject:	Veterinary Genetics
Specialization:	Veterinarian
Term of the subject:	2 nd year 2 nd semester (the 4 th semester in spring)
Number of lectures/semester practicals/semester	30 lectures/semester and 30 labs/semester
Credit:	3
Prerequisites:	successful examinations in Biomathematics, Botany .
Name of Department:	Department for Animal Breeding, Nutrition and Laboratory animal science Division for Animal Breeding and Genetics
Responsible teacher (email):	Assoc . Prof . dr . habil . András Gáspárdy (gaspardy .andras@univet .hu)

Teacher(s) take part in teaching:	dr . habil . András Gáspárdy, Prof . László Zöldág, Dr . habil . Ákos Maróti-Agóts, Dr. Petra Zenke, Dr. Boglárka Vincze and László Szabára
Aim of subject:	COURSE CONTENT: This subject, putting a special emphasis on Mendelian, immuno-, clinical (hereditary diseases), population and molecular genetics, furthermore biotechnology and preservation of genetic resources . The methods of breeding value evaluation, selection, breeding improvement, and breeding systems are also synthesized, using the classical and up to date scientific knowledge of Mendelian, population and molecular genetics .
Weekly schedule of lectures	
1 . week	Introduction: Domestication of species, evolutionary consequences
2 . week	Fundamentals of Mendelian, cyto- and molecular genetics
3 . week	Hereditary diseases and abnormalities (monogenes, mutations: gene diagnosis, prevention, polygenic inheritance: threshold value)
4 . week	Mendelian exceptions (expressivity, penetrance, allelic polymorphism, immunogenetics, lethal genes, epigenetics, epistasis, pleiotropy, recombination)
5 . week	Mendelian exceptions (linkage, sex linked, XL, ZL, uniparental inheritance and monogenes, major genes, mutations)
6 . week	Biotechnology in animal breeding (AI, ET, MOET, EMT)
7 . week	Biotechnology in animal breeding (cloning, transgenesis, GMO, CRISPR)
8 . week	Holiday
9 . week	Qualitative population genetics: gene and genotype frequencies
10 . week	Quantitative population genetics: heritability, repeatability, correlation, regression
11 . week	Traits, breeding value and estimation methods

12 . week	Selection (methods, types, forms, selection index, MAS, efficiency)
13 . week	Breeding systems and methods: pure-breeding, crossbreeding, heterosis
14 . week	Preservation and conservation of genetic diversity and resources, endangered breeds
15 . week	Technology of animal production, concept of type, basics of conformation judging
Recommended literature	
Obligatory:	Zöldág, L. - Gáspárdy, A. – Maróti-Agóts, Á. – Buleca, J. – Seregi, J. – Matiuti, M. (2008): Veterinary genetics and animal breeding (ed . Zöldág László) . A/3 Printing Ltd ., Budapest, ISBN 978-963-88110-0-4 .
Recommended:	
Type and method of exam:	
Exam within the exam period which consists of two (practical and theoretical) parts. At first, students are controlled by a questionnaire on computer (according to their rapid answers to basic figures, definitions, associations and calculations) as a threshold to enter into the theoretical part. The performance from 60% is successful. And then, they choose three questions, and after a preparation time they answer these orally . All the three questions should be answered (a single unknown question leads to failure) . All questions are published in advance . In case of failed exam, students with at least 80% performance in computer test do not need to repeat the practical part .	
Note(s):	
Responsible tutor of the class is Assistant Professor Dr . Boglárka Vincze (vincze .boglarka@univet .hu) . The teacher responsible for the subject (Dr . András Gáspárdy) gives through the up-to-date materials of the lectures and practical to the class representative on the course of the semester (however, these are also available at http://univet .hu/en/students/courses/veterinary-genetics/download/7695#) . The question lists for the practical as well as for the theoretical part of the exam are preliminary brought out (gat .univet .hu , and on the Institutional homepage: http://univet .hu/en/students/ courses/veterinary-genetics/exam-info , respectively) . Teaching starts on the first week (05. February 2018.) Altogether three absences from the practical are allowed, but the re-take of them is compulsory . The presence is controlled on every occasion . On the course of a re-take student have to account for the knowledge of the missed practical by the lecturer who kept the practical/lab before exam period . Please, appear on the Zoo-lab in suitable shoes, on the genetic-lab in white coat .	

VETERINARY PHYSIOLOGY 1

Description, learning outcome

As one of the biological sciences Physiology is the study of the normal functions of the body . It describes and interprets spatial and temporal processes occurring in cells and tissues of the body . To describe these processes Physiology applies the quantitative and qualitative experimental methods used in Physics, Chemistry, Biophysics, and Biochemistry .

The course emphasizes those aspects of Physiology essential for the further study of veterinary science and for veterinary practice . As Physiology is a general subject we teach those topics that are of relevance to veterinary practice in detail to allow students to get an inside view of the fields under research . During the Physiology practical courses our aim is to prepare students for the manual work that is an essential part of the veterinary practice . Apart from gaining manual experience we hope that students will perceive the connection between theory and practice and sense the beauty of physiological research .

Detailed schedule (2×2 lectures per week)		
1 . week	Introduction	Inner environment, blood
2 . week	Inner environment, blood	Inner environment, blood
3 . week	Inner environment, blood	Inner environment, blood
4 . week	Midterm test	Immunophysiogogy; musclephysiology
5 . week	Immunophysiogogy; musclephysiology	Immunophysiogogy; musclephysiology
6 . week	Immunophysiogogy; musclephysiology	Cardiovascular system
7 . week	Midterm test	Cardiovascular system
8 . week	Cardiovascular system	Cardiovascular system
9 . week	Cardiovascular system	Cardiovascular system
10 . week	Midterm test	Kidney physiology
11 . week	Kidney physiology	Kidney physiology
12 . week	Kidney physiology	Kidney physiology
13 . week	Midterm test	Respiration
14 . week	Respiration	Make-up midterms

Assessment

At the end of the first semester students receive a grade based on their points collected. The next table shows the grades as a function of collected points .

0 % - 50 % not accepted

above 50 % accepted top

10 % excellent

Not fulfilling the laboratory requirements will result in a “not accepted” grade.

Practical courses (3×45 minutes/every second week)

<p>There are 5 labs in each semester . Each of the labs should be successfully completed . At the beginning of each lab there is an entrance test which consists of 10 questions . Five questions ask about the lab manual while another 5 ask about standard data . No fraction of a point can be given for the tests . The lab is successfully completed when the student actively participates the lab, the instructor does not notice serious deficiency in theoretical knowledge, and the entrance test has at least 7 good answers .</p>	
Detailed lab schedule	<p>Lab 1: Hematology I . Lab 2: Hematology II . Lab 3: Muscle physiology Lab 4: Heart function Lab 5: Respiration and excretion</p>
Literature	
Required literature	Lecture notes available in PDF format
	Gyórfy A., Rónai Zs.: Physiology practical course. Available electronically .
	Gyórfy A., Rónai Zs.: Standard data. Available electronically.
Recommended literature	Cunnigham J . G . (2007): Textbook of Veterinary Physiology . Philadelphia: W . B . Saunders
	Sjaastad O . V ., Hove K ., Sand O . (2010): Physiology of Domestic Animals . Oslo: Scandinavian Veterinary Press
	Swenson M . J . (2004): Dukes' Physiology of Domestic Animals . Ithaca, London: Cornell University Press

VETERINARY PHYSIOLOGY 2

Description, learning outcome

As one of the biological sciences Physiology is the study of the normal functions of the body . It describes and interprets spatial and temporal processes occurring in cells and tissues of the body . To describe these processes Physiology applies the quantitative and qualitative experimental methods used in Physics, Chemistry, Biophysics, and Biochemistry .

The course emphasizes those aspects of Physiology essential for the further study of veterinary science and for veterinary practice . As Physiology is a general subject we teach those topics that are of relevance to veterinary practice in detail to allow students to get an inside view of the fields under research . During the Physiology practical courses our aim is to prepare students for the manual work that is an essential part of the veterinary practice . Apart from gaining manual experience we hope that students will perceive the connection between theory and practice and sense the beauty of physiological research .

Detailed schedule (2×2 lectures per week)		
1 . week	Physiology of digestion	Physiology of digestion
2 . week	Physiology of digestion	Physiology of digestion
3 . week	Physiology of digestion	Endocrinology
4 . week	Midterm test	Endocrinology
5 . week	Endocrinology	Endocrinology
6 . week	No lecture	Endocrinology
7 . week	Midterm test	Reproduction
8 . week	Reproduction	Reproduction
9 . week	Reproduction	Reproduction
10 . week	No lecture	No lecture
11 . week	Midterm test	Neurophysiology
12 . week	Neurophysiology	Neurophysiology
13 . week	Neurophysiology	Neurophysiology
14 . week	Midterm test	Bones and minerals
15 . week	Bones and minerals	Make-up midterms

Assessment

The written final exam is evaluated on the regular scale of 1 to 5.

0-50 points	1 (elégtelen)
51-60 points	2 (elégséges)
61-70 points	3 (közepes)
71-80 points	4 (jó)
81-100 points	5 (jeles)

Practical courses (3×45 minutes/every second week)

<p>There are 5 labs in each semester . Each of the labs should be successfully completed . At the beginning of each lab there is an entrance test which consists of 10 questions . Five questions ask about the lab manual while another 5 ask about standard data . No fraction of a point can be given for the tests . The lab is successfully completed when the student actively participates the lab, the instructor does not notice serious deficiency in theoretical knowledge, and the entrance test has at least 7 good answers .</p>	
Detailed lab schedule	<p>Lab 6: Nervous system Lab 7: Sensory functions Lab 8: Digestion Lab 9: Endocrinology Lab 10: Cardiovascular regulation</p>
Literature	
Required literature	Lecture notes available in PDF format
	Gyórfy A., Rónai Zs.: Physiology practical course. Available electronically .
	Gyórfy A., Rónai Zs.: Standard data. Available electronically.
Recommended literature	Cunningham J . G . (2007): Textbook of Veterinary Physiology . Philadelphia: W . B . Saunders
	Sjaastad O . V ., Hove K ., Sand O . (2010): Physiology of Domestic Animals . Oslo: Scandinavian Veterinary Press
	Swenson M . J . (2004): Dukes' Physiology of Domestic Animals . Ithaca, London: Cornell University Press

SAMPLE

Schedule

- The structure and organization of Hungarian animal health system
- Tasks and duties of a state veterinarian
- Activity of the Hungarian Veterinary Chamber
- Opportunities for veterinarians in a village, small- and large city
- Specialisation according to animal species (cattle, swine, poultry, dog, cat, horse, exotic animals)
- The Organization of Hungarian Veterinarians and Animal Health in the neighbouring countries
- The role of veterinarians in food hygiene
- Opportunities as pharmaceutical representative
- Public – health related tasks of a veterinarian
- Food production in the 21st century

Invited Lecturers

Dr . Abonyi Tamás Dr . Boros István Dr . Búza László Dr . Horn Péter Dr . Krajcsovics László Dr . Loráskó Gábor Dr . Móre Attila Dr . Sikó Barabási Sándor Dr . Süth Miklós Dr . Tóth Tamás Dr . Vass Péter

VETERINARY PROFESSION

Responsible teacher	Dr . Péter Sótonyi, D .V .M ., Ph .D, Professor, Head of Anatomy Department
Aim of the subject	To give an overview to the second year students about the different veterinary activities, how colourful the veterinary profession is and what our expectancies can be regarding finding a job with this field.
Place in the curriculum	3rd semester
Number of lectures	15 hours lectures (15 x 45 minutes)
Credit	1
Condition of semester completion	attendance at lectures
Type of exam	written exam on a 3-grade scale

SAMPLE

VETERINARY VIROLOGY

Subject of lectures in detail			
	Virology lectures, 2nd semester, 2015/2016	Date	Lecturer
1	Place and significance of viruses in the biosphere, evolution of viruses.	08 .02	TB
2	Propagation of viruses I . (Inoculation of embryonated eggs, experimental infection of laboratory animals) .	08 .02	TB
3	Propagation of viruses II . (Production of cell cultures .)	09 .02	TB
4	Concentration and purification of viruses.	15 .02	TB
5	Morphology of viruses .	15 .02	TB
6	General characteristics and purification of viral nucleic acid. Methods of nucleic acid investigation I .	16 .02	TB
7	Methods of nucleic acid investigation II .	22 .02	TB
8	Viral proteins, their role and methods of their investigation . Viral lipids and carbohydrates .	22 .02	TB
9	General features of virus multiplication .	23 .02	PF
10	Transcription, translation and nucleic acid replication of DNA viruses .	29 .02	TB
11	Transcription, translation and nucleic acid replication of RNA viruses .	29 .02	TB
12	Mutation of viruses and its role in virus evolution .	01 .03	TB
13	Viral interactions (recombination, complementation, phenotypic mixing, interference, virus exaltation) .	05 .03	TB
14	Virus-host cell interactions, viral oncogenicity, cytopathic effects and plaque formation .	05 .03	TB
15	General features of viral infection (infection routes, factors influencing the virus - host interactions); types of viral infections (acute, latent, tolerated, persisting and slow infections) .	07 .03	TB
16	Laboratory diagnosis of viral infections (collection and transport of samples) .	07 .03	PF
17	Direct demonstration of virus infections I (virus isolation and identification).	08 .03	PF
18	Direct demonstration of virus infections II (detection of viral antigens and viral nucleic acid) .	29 .03	PF
19	Titration of viruses (infective titer, hemagglutinating titer) .	04 .04	PF
20	Detection and titration of antiviral antibodies (serumneutralization, hemagglutination inhibition) .	04 .04	PF

21	Antiviral medicines, interferons, interferon inducers and immune sera in therapy .	05 .04	TB
22	Immunization against viral diseases, types of viral vaccines .	11 .04	TB
23	Papillomaviridae, Polyomaviridae, Adenoviridae .	11 .04	TB
24	Herpesviridae .	12 .04	TB
25	Poxviridae .	18 .04	TB
26	Asfarviridae, Hepadnaviridae, Parvoviridae, Circoviridae .	18 .04	TB
27	Reoviridae, Birnaviridae .	19 .04	TB
28	Picornaviridae, Caliciviridae .	25 .04	TB
29	Togaviridae, Flaviviridae .	25 .04	TB
30	Nidovirales (Coronaviridae, Arteriviridae .)	26 .04	TB
31	Orthomyxoviridae .	02 .05	TB
32	Paramyxoviridae .	02 .05	TB
33	Rhabdoviridae, Filoviridae .	03 .05	TB
34	Bunyaviridae, Arenaviridae, Bornaviridae .	09 .05	TB
35	Retroviridae .	09 .05	TB
36	Bacteriophages .	10 .05	TB
37	Viroids, prions .	17 .05	TB

Subject of practicals in detail

1st practical	(22-25 . February 2016 .) Virus isolation from diagnostic samples (inoculation of embryonated eggs, and cell cultures)
2nd practical	(7-10 March 2016.) Virus-induced cytopathic effects and plaque-formation on cell cultures
3rd practical	(18-21 April 2016 .) Direct diagnosis of viral infections using molecular methods I. (virus nucleic acid purification, polymerase chain reaction)
4th practical	(2-5 May 2016 .) Direct diagnosis of viral infections using molecular methods II . (agarose gel electrophoresis), indirect diagnosis of viral infections I . (virus neutralisation test)
5th practical	(9-12 May 2016 .) Indirect diagnosis of viral infections II . (evaluation of virus neutralisation, haemagglutination inhibition)
Re-take practicals	at discussed dates .

Group-change at practicals is not possible, please, sign up to that group at the start of the semester, with which you can complete all five practical lessons!

The practicals start with a short test: 12 questions of the actual practical's handout. Please, prepare for the lessons! You must collect 30 out of 60 points to get signature in the black book at the end of the semester.

Handouts can be downloaded, password: see in Neptun among the information of the course.

Attending the practicals is compulsory, absence should be remedied. Remedy can happen on the same week by joining an other group or attending the extra practical on the last week of the semester.

Absence from only 1 practical (and its re-take) is acceptable. After 2 missed practicals the re-take is not possible and the course will not be signed in the black book.

Without sufficient knowledge of the subjects' theoretical background, attendance at practicals is not accepted. Students can sit to the examination after attending the lectures and all practicals.

VETERINARY BIOCHEMISTRY

DIVISION OF BIOCHEMISTRY STAFF:

Dr . Zsuzsanna Neogrády, PhD (Neogrady .Zsuzsanna@aotk .szie .hu)

Associate professor, head of Division

- Biochemistry lectures and practicals in Hungarian, English and German
- Pathobiochemistry in Hungarian, English and German (elective course)

Dr . Gábor Mátis, PhD (Matis .Gabor@aotk .szie .hu)

Senior lecturer

- Biochemistry lectures and practicals in Hungarian, English and German
- Pathobiochemistry in Hungarian, English and German (elective course)

Anna Kulcsár (Kulcsar .Anna@aotk .szie .hu)

Research fellow, PhD student

- Biochemistry practicals in Hungarian and English

Dr . Janka Petrilla (Petrilla .Janka@aotk .szie .hu)

Research fellow

- Biochemistry practicals in Hungarian and English

Júlia Sepródi (Seprodi .Julia@aotk .szie .hu)

Secretary

Márta Tolnainé Hinka

Assistant

Veterinary Biochemistry is taught during two semesters, in the following theoretical and practical class time:

Biochemistry 1 . 30 lectures (1×2 hours/week)
 15 practicals (5×3 hours)

Biochemistry 2 . 60 lectures (2×2 hours/week)
 18 practicals (6×3 hours)

Special requirements only for students exempted from Biochemistry 1 . and for the additional exam "Biochemistry of ruminants and vitamins" can be seen in *italics* on page 9 and 10 .

GENERAL INFORMATION ON LECTURES:

According to 5/2007 circular letter of the Dean, attendance to lectures is obligatory. Each student is allowed to miss maximum 3 lecture hours per semester. The absence (for any other educational reason) has to be certified by the instructor of the student. Absence due to proven (medical certificates) long-term hospitalization is considered as certified. Certifications have to be passed to the secretary of the Division until the end of the

semester . The Department of Physiology and Biochemistry verifies the attendance to lectures on a random basis.

Weekly schedule of lectures	
BIOCHEMISTRY 1 .	
1 . week	Introduction . Internal environment, homeostasis . Isotonia, isoionia .
2 . week	Isohydria. Buffer systems. Structure of the biological membranes.
3 . week	Transports across the biological membranes . General characteristics of proteins .
4 . week	Classification and structure of proteinogenic amino acids. Peptide bond. Structure of proteins . Denaturation and renaturation of proteins .
5 . week	Classification of proteins. Collagen, elastin, keratin. Characterization of enzymes. Mechanism of enzyme action . Reversibility of enzymatic reactions .
6 . week	Factors influencing the velocity of enzymatic reactions. Regulation of enzyme activities . Zymogens, isoenzymes .
7 . week	Nomenclature, classification and cellular localization of enzymes. Molecular biology. Structure of nucleotides .
8 . week	De novo synthesis and degradation of purine nucleotides . De novo synthesis and of pyrimidine nucleotides .
9 . week	Degradation of pyrimidine nucleotides . Salvage pathways of nucleotide metabolism . Synthesis and degradation of deoxyribonucleotides .
10 . week	Structure and function of DNA . Replication of DNA in prokaryotes and eukaryotes .
11 . week	Mutations, repair mechanisms . Transcription and its regulation in prokaryotes .
12 . week	Transcription and its regulation in eukaryotes. Influencing of gene expression. Epigenetic regulatory mechanisms .
13 . week	Translation . Structure of the ribosomes . Activation of amino acids . Initiation of the translation .
14 . week	Elongation and termination of the translation. Posttranslational modifications and transport of proteins .
15 . week	Recombinant DNA technology and biotechnology .
BIOCHEMISTRY 2 .	
1 . week	General introduction to the intermediary metabolism . Oxidative degradation of fuel molecules: anabolism and catabolism . Conservation of metabolic energy in the cell: high energy phosphates . Metabolism of creatine .
2 . week	Carbohydrates: role, classification: monosaccharides, oligosaccharides, homo- and heteropolysaccharides . Glycogen metabolism: Cori cycle, glycogenolysis, cAMP and cascade reaction of glycogen degradation, glycogenesis .
3 . week	Glycolysis and gluconeogenesis. Pasteur effect, the oxidation of pyruvate to acetyl CoA . Citric acid cycle .

4 . week	Respiratory chain, oxidative phosphorylation . The pentose phosphate pathway . The blood sugar and its regulation . Metabolism of other monosaccharides: fructose, galactose .
5 . week	Amino acid metabolism: transamination, oxidative deamination . Glucogenic, ketogenic, essential, non-essential amino acids. Detoxification of ammonia: urea cycle, ammonium ion formation . Decarboxylation of amino acids, most important peptides .
6 . week	Structure of heme . Porphyrine metabolism: synthesis and degradation . Hemoglobin, Myoglobin, Catalase, Peroxidase, Cytochromes . Iron metabolism . Role and chemical structure of lipids . Absorption and transport of lipids .
7 . week	Lipolysis, degradation of fatty acids: beta-oxidation (even-, odd-carbon and unsaturated fatty acids) . Degradation of glycerol, biosynthesis of oxaloacetate, ketogenesis, ketolysis .
8 . week	Synthesis of fatty acids: even-carbon, odd-carbon, unsaturated fatty acids . Synthesis of glycerol . Biosynthesis of fats (lipids) . Lipoids: phosphoglycerides, sphingolipids, steroids: cholesterol, bile acids . Carotenoids .
9 . week	Role of the liver: intermediary metabolism, secretion, detoxification: synthesis, oxidation, reduction, hydrolysis, conjugation . Biochemistry of muscle (striated, red, white and cardiac muscle), muscle proteins, muscle contraction . Biochemistry of brain and adipose tissue .
10 . week	Carbohydrate metabolism of ruminants: Production and absorption of volatile fatty acids . Metabolism of the volatile fatty acids in the ruminants' tissues . Metabolism of nitrogen-containing compounds in ruminants . Lipid metabolism of ruminants . Ketosis of the ruminants . Biochemistry of milk production .
11 . week	Introduction of vitamins . Biochemistry of retinol (vitamin A) and calciferol (vitamin D) .
12 . week	Biochemistry of tocopherol (vitamin E), phyloquinon (vitamin K), essential fatty acids and thiamine (vitamin B1) .
13 . week	Biochemistry of riboflavin (vitamin B2), niacinamide (vitamin B3), pantothenic acid (vitamin B5) and pyridoxine (vitamin B6) .
14 . week	Biochemistry of biotin (vitamin B7), folic acid (vitamin B9) and cobalamin (vitamin B12) .
15 . week	Biochemistry of ascorbic acid (vitamin C) and lipotropic factors (choline, inositol) .

GENERAL INFORMATION ON THE PRACTICALS:

The timetable for the practicals is set by the Secretariat for International Study Programs (**max . 15** students) . Students must be on time; otherwise it is prohibited to take part in the lab for technical reasons . Each lab lasts 3×45 minutes . (For technical reasons there can be no pauses or breaks during the lab, so that each lab lasts for **2 hours 15 min .** altogether .)

The laboratory courses are held in the **Students' laboratory on the 1st floor** of the Department .

The students are required to take with them:

- the **Laboratory Manual**, which should be downloaded from the homepage of the Department (http://biochemvet.hu/?page_id=346&lang=en)
- **white coats**, because some of the used reagents and chemicals may damage the clothing .

At the end of the lab the **students have to tidy up after the work** . The used pipettes and reagent tubes should be washed with tap water and put into the collector pot . Any accident occurred during the lab (e . g . breakage

of any glass instruments) must be reported to the instructor immediately, in order to prevent any personal injuries .

Qualification system:

Lab work will be qualified by the followings:

- **Short written test** at the beginning of the lab, regarding the theoretical and practical essence of the experiments and the appropriate theoretical subject-material . On certain practicals the appropriate **chemical structures**, in connection with the lab topic, will be also asked in the test . For the structure list, see the lab manual for each lab course on the webpage .
- **Short oral examination** at the end of the lab, concerning the results of the lab work, which have to be registered also into the manual .

If a student proves to be unprepared in the course of the lab, the instructor may mandate him or her to repeat the lab another time . Every student will get points for their actual work at the end of the lab. These points can be between one and five (with one point it is not accepted, the lab has to be repeated with another group or at the additional course at the end of the semester) . Results of successful labs (2-5 points) cannot be modified.

In the 1 . semester (Veterinary Biochemistry 1 .) 5 labs are held, and the students have to collect **at least 15 points (60%)** . In the 2 . semester (Veterinary Biochemistry 2 .) semester 6 labs are held, and the students have to collect **at least 18 points (60%)** .

Registration of taking part in other group:

To change the group for the whole semester, permission should be asked from **Dr . Janka Petrilla** within one week after enrolling.

If there are **acceptable reasons**, the student might carry out his/her lab with another group . **In this case the student should write an email to**

biochem@univet .hu

until the working day before the wanted lab **till 2 .00 p .m** . Permission may or may not be granted depending on the headcount of the group, and the number of students asks to join . Since the capacity of the practical room is rather limited, there is only a limited possibility of changing the group . Without any permission it is not possible to join a different group.

The student **may miss only 2 labs in the semester**, but these **must be also made up** with another group or at the additional course . (The student misses a lab if he/she does not accomplish the practical with his/her own group or with another group .) The terms of the additional courses will be found on the homepage of the Dept . and on the billboard at the entrance of the building . But we suggest for the students to take part on the regular labs because of the optimal time-table and loading! If the student misses the additional course, or he/she does not accomplish it successfully (get 1 or 0 point), means that his/her semester is not accomplished, the semester cannot be accepted, there is no additional possibility for retake the lab . If the student misses 3 or more labs in the semester, he/she is not allowed to take part on the additional course and the semester cannot be accepted .

Topics of the practicals: Biochemistry 1

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- 1 . Examination of the biological oxidation
 - 2 . Blood sugar level and its regulation
 - 3 . Examination of haemoglobin and its degradation products
 - 4 . Examination of lipids
 - 5 . The determination of vitamins
- Biochemistry 2 ∴**
- 6 . Examination of some biochemical parameters of the blood plasma
 - 7 . Examination of proteins
 - 8 . General properties of the enzymes, enzyme activity

9 . Examinations of enzymes of digestion

10 . The most important reactions of amino acids 11 . Examination of nucleic acids

REQUIREMENTS SYSTEM OF BIOCHEMISTRY 1 .:

Requirements of the acceptance of the semester:

- Fulfilling the requirements of the **theoretical part of Biochemistry 1 .:**
 - Regular visiting of the lectures (no more than 3 unjustified absences can be accepted).
 - Completion of 60% (18 points) of the maximal scores (30 points) on the written midterm test or midterm retake . If midterm retake is failed, the semester can be accepted if the student gets min . 18 points (60%) on the end-term examination at the end of the semester .
- Fulfilling the requirements of the **practical part of Biochemistry 1 .:**
 - Successful performance of all laboratory courses .
 - Completion of 60% (15 points) of the maximal scores (25 points) in the laboratory courses .

If the written midterm test (or the midterm retake or the end-term examination) has not been completed, but the requirements of the practical part of Biochemistry 1. have been fulfilled, the semester is not accepted; however, only the midterm has to be repeated during a later semester . If the requirements of the practical part of Biochemistry 1. have not been fulfilled, but the written midterm test (or the midterm retake or the end-term examination) has been completed successfully, the semester is not accepted; however, only the practical part has to be repeated during a later semester .

It means that the **theoretical (lectures, midterm) and practical (laboratory practicals) parts of Biochemistry 1 . can be completed independently from each others** . But please note that Biochemistry 1 . labs and midterm will be held only in the spring semester of each academic year .

General remarks about the midterm (Biochemistry 1 .):

The date of the **midterm** and the topics included in the test is published on the homepage of the Department . The midterm is accepted if the student completes **60% (18 points)** of the maximal scores (**30 points**) . If the midterm is failed, there is a second possibility to retake it . The date of the **midterm retake** is published on the beginning of the semester . The curriculum and requirements of the midterm retake are the same as the first midterm. **Tests are on display** in a limited interval . The date and time of display are announced with results . No further possibility is given to see the tests . If the midterm retake is failed, there is an extra possibility to get the semester accepted: an **oral or written end-term examination** has to be taken from each topic of the semester . The type (oral or written) and date of the examination is determined by the Department . The result of the examination is scored and can be accepted if min . 18 points (60%) has been reached . Please note that no more than 22 points can be earned on the end-term examination since this is a special opportunity to fulfill the requirements of the course. If the student misses the midterm, the midterm retake or the end-term examination by any reason, he/she has no more extra opportunity to retake .

If the student passed the midterm, it is possible to try to improve it on the midterm retake, but in this case the semester will be evaluated based on the points of the retake . The result of successful midterm or midterm retake cannot be modified on end-term examination.

On the midterm (and midterm retake, or end-term examination) no tools can be used except a pen taken by the student . The test must be written with blue or black pen, if the test is written with any other color, or with pencil, it will not be evaluated . (In case the student draws the chemical structures with pencil first, they have to be rewritten with pen before submission.) For the request of the room supervisor the student has to be able identify himself/herself by student card or ID . In any case of violation of the rules of midterm, the test is taken away from the student and is evaluated as "*not accepted*" .

Evaluation system at the end of the Biochemistry 1 . course:

At the end of the Biochemistry 1 . course, students will be evaluated by a **practical course grade** (3 credits) if all requirements of Biochemistry 1. are fulfilled. The grade is evaluated after summation of the points completed on practicals and on the midterm (or midterm retake, or end-term examination) as follows:

51 – 55 points:	excellent (5)
45 – 50 points:	good (4)
40 – 44 points:	medium (3)
33 – 39 points:	satisfactory (2)
0 – 32 points:	unsatisfactory (1)

REQUIREMENTS SYSTEM OF BIOCHEMISTRY 2 .:**Attending the Biochemistry 2 . course:**

Biochemistry 2 . lectures and laboratory practicals can be visited and the Biochemistry 2 . midterm can be written even without having Biochemistry 1 . accepted . It means that **completing the requirements of Biochemistry 1 . is not a prerequisite of registering and attending for the Biochemistry 2 . course .** However, **attending the Biochemistry final exam is only possible after successful completion of all requirements of both Biochemistry 1 . and 2 . courses .** **Requirements of the acceptance of the semester:**

- Fulfilling the requirements of the **theoretical part of Biochemistry 2 .:**
 - Regular visiting of the lectures (no more than 3 unjustified absences can be accepted).
 - Completion of 60% (18 points) of the maximal scores (30 points) on the written midterm test or midterm retake . If midterm retake is failed, the semester can be accepted if the student gets min . 18 points (60%) on the end-term examination at the end of the semester .
- Fulfilling the requirements of the **practical part of Biochemistry 2 .:**
 - Successful performance of all laboratory courses .
 - Completion of 60% (18 points) of the maximal scores (30 points) in the laboratory courses .

If the written midterm test (or the midterm retake or the end-term examination) has not been completed, but the requirements of the practical part of Biochemistry 2. have been fulfilled, the semester is not accepted; however, only the midterm has to be repeated during a later semester . If the requirements of the practical part of Biochemistry 2. have not been fulfilled, but the written midterm test (or the midterm retake or the end-term examination) has been completed successfully, the semester is not accepted; however, only the practical part has to be repeated during a later semester .

It means that the **theoretical (lectures, midterm) and practical (laboratory practicals) parts of Biochemistry 2 . can be completed independently from each others .** But please note that Biochemistry 2 . labs and midterm will be held only in the fall semester of each academic year . It should be also regarded that **attending the Biochemistry final exam is only possible after successful completion of all requirements of both Biochemistry 1 . and 2 . courses .**

General remarks on the Biochemistry 2 . midterm:

The rules of the midterm and retake of the midterm are the same as for Biochemistry 1 .

Evaluation system at the end of the Biochemistry 2 . course:

Upon acceptance of the Biochemistry 2 . semester, a signature is being given . Studying Biochemistry ends with a **final examination** (5 credits) . **Requirements of taking part on the final exam are the successful**

completion of all requirements of both Biochemistry 1 . and 2 . courses and completion of Chemistry 2 . exam .

GENERAL REMARKS ON THE FINAL EXAM:

Studying Biochemistry ends with a **final examination** (5 credits) . **Requirements of taking part on the final exam are the successful completion of all requirements of both Biochemistry 1. and 2. courses and completion of Chemistry 2 . exam .**

The grade of the final exam on Biochemistry will be evaluated based on four partial grades as follows:

- **Practical course grade:** determined based on the sum of the points completed on the **practicals and midterm of Biochemistry 2 .** as follows:

55 – 60 points: excellent (5)

49 – 54 points: good (4)

43 – 48 points: medium (3)

36 – 42 points: satisfactory (2)

- Grade of the **Written part of the exam**
- **Oral exam:** grades given for the two topics

The grade of the final exam will be determined by the examiner based on the 4 partial grades (practical course grade, grade of the written part of the exam, grades given for the two topics of the oral exam). The grade of the final exam is not calculated automatically as a mean of the partial grades .

Written part of the exam:

In the May/June exam period at least 4 dates will be provided for the written part of the exam . The dates will be determined after consultation with the students and will be announced during the semester . At least 2 dates will be provided in the August/September exam period . Two dates will be offered in the autumn and the spring semester as well as in the winter exam period for inactive students . Altogether 4 chances are given for inactive students to try the written part of the exam during the inactive year .

Registration for the written part of the exam is possible only via the Neptun system. After registration for the exam the student can modify or delete the date in the Neptun system until the working day before exam till 10 .00 a .m .

The following topics will be included in the written part of the exam:

- Millieu enterieur, general factors of homeostasis. Isovolemia, isotonia, isoionia, isohydria. Buffer systems .
- Structure of the biological membranes . Transports across the biological membranes .
- Classification and structure of proteinogenic amino acids.
- General characteristics of proteins .
- Peptide bond. Structure of proteins. Denaturation and renaturation of proteins. Classification of proteins . Collagen, elastin, keratin .
- Characterization of enzymes . Mechanism of enzyme action . Reversibility of enzymatic reactions .
- The velocity of enzymatic reactions and factors influencing it. Regulation of enzyme activities. Zymogens, isoenzymes. Nomenclature, classification and cellular localization of enzymes.
- Structure of nucleotides . Structure and function of DNA .
- Replication of DNA in prokaryotes and eukaryotes . Mutations, repair mechanisms .
- Transcription and its regulation in prokaryotes and eukaryotes. Influence on gene expression. Epigenetic regulatory mechanisms .

- Structure of the ribosomes . Activation of amino acids . Initiation, elongation and termination of the translation. Posttranslational modifications and transport of proteins.
- Theoretical background of recombinant DNA technology .
- Chemistry of carbohydrates (monosaccharides, oligosaccharides, homo- and heteropolysaccharides) .
- Biochemical role and structure of lipids .
- Biochemistry of glycerol phosphatides and sphingolipids .

In addition to the listed topics the main **chemical structures** will be also asked in the written part of the exam . For the structure list, see the webpage of the Dept .

The structure of the written part of the exam:

1 . **Simple choice: 40 points** (1 point/question) 2 .

Chemical structures:

Recognize structures: 10 structures **10 points** (1 point each)

The rules of the written part of the exam are the same as the rules of the midterm . Students have 75 minutes to work on it . The written part of the exam is accepted if the student completes **60%** (30 points) of the maximal scores (50 points) . The results of the written part of the exam will be found on the homepage of the Dept . and on the billboard at the entrance of the building not later than the first working day after the exam. The written part of the exam is on display in a limited interval. The date and time of display are announced with results .

No further possibility is given to see the tests . **Evaluation of the written part of the exam:**

- 50 points: excellent (5)
- 40 – 44 points: good (4)
- 35 – 39 points: medium (3)
- 30 – 34 points: satisfactory (2)
- 0 – 29 points: unsatisfactory (1)

The student can register for the oral exam if the written part of the exam is succeeded . If the written part of the exam is failed or the student does not appear on the exam (after valid registration), the student misses one chance for the written part of the exam and he/she can register for a next date in the exam period . Every failed written part of the exam reduces the number of chances for the written part of the exam . In one exam period the student has max . 2 chances (and max . 2 additional chance in the Aug ./Sept . exam period) to complete the written part of the exam .

The grade of a successful written part of the exam can be included in the final grade in any of the following exam periods . If the student passed the written part of the exam, it is possible to retake it once on a next date, but in this case the final grade will be evaluated based on the grade of the retake of the written exam . Retake of a successful written exam does not reduce the number of chance for the written part of the exam. After successful oral exam, the written part of the exam cannot be repeated .

Students exempted from Biochemistry 1. are exempted from the written part of the exam.

Oral exam:

The oral exam can be completed only after a successful written part of the exam, not earlier than the second working day after the written part (there has to be at least one working day between the written and oral exams). After consultation with the students, certain exam dates will be provided by the Dept . for oral exams . Registration for the oral exam is possible only in the Neptun system . The oral exams start at 8 .00 a .m . on the announced exam days . No tools can be used on the oral exam . The oral exam can be completed only if the student has the “black book” with him/her . The examinees draw one paper sheet with two topics . The students have at least 30 min . to prepare . Then the examinee reports orally about his/her competence regarding the given topics . The goal of the exam is not only to check the lexical knowledge, but to make sure that the

student understands the interrelationships between certain topics and he/she can apply his/her knowledge in the future studies as well . Hence, the knowledge of the student can be checked with further questions concerning all topics of Biochemistry 2 . and 1 . as well (*also for students exempted from Biochemistry 1*) .

Students, attending additional exam “Biochemistry of ruminants and vitamins”, can be also asked concerning topics closely related to ruminants and vitamins, such as the basics of the intermediary metabolism and composition of macromolecules. Therefore, it is advised for these students to visit the lectures of the intermediary metabolism topics as well.

If the grade of any oral topics is “unsatisfactory (1)”, the final grade will be “unsatisfactory (1)” independently of the other partial grades . In this case the student has to retake only the oral exam, the result of the written part and the practical course grade will be included in the final grade of the next exam as well .

The student has 2 chances to take the oral exam in the May/June exam period, and 2 additional chances in the Aug ./Sept . exam period . Unsuccessful oral exam can be retaken not earlier than the third day following the unsuccessful exam . If the oral exam is succeeded, there is an opportunity to try to improve the final grade once if the student retakes the oral exam.

Topic list of the oral exam:

Topic group I .:	
1 .	<ul style="list-style-type: none"> • Oxidative degradation of fuel molecules . • Biochemistry of high energy phosphate compounds . <i>Structure, biochemical function.</i> • Metabolism of creatine . <i>Structure, synthesis, biochemical function.</i> • Thioester bond .
2 .	<ul style="list-style-type: none"> • Glycogenesis, glycogenolysis . <i>Steps, location, importance. Regulation, signal pathways of glucagon/adrenaline and insulin.</i>
3 .	<ul style="list-style-type: none"> • Glycolysis . <i>Steps, types, location, regulation, energy balance, importance.</i> • The Pasteur effect and Cori cycle.
4 .	<ul style="list-style-type: none"> • Gluconeogenesis . <i>Steps, entry of different substrates, location, regulation, energy balance, importance.</i>
5 .	<ul style="list-style-type: none"> • Oxidation of pyruvate to acetyl~CoA . <i>Steps, necessary cofactors, importance.</i> • Glycerol phosphate shuttle .
6 .	<ul style="list-style-type: none"> • Citric acid cycle . <i>Steps, location, regulation, energy balance, importance.</i>
7 .	<ul style="list-style-type: none"> • Respiratory chain, oxidative phosphorylation . <i>Structure, steps, location, energy balance, importance. P/O proportion, uncoupling factors.</i>
8 .	<ul style="list-style-type: none"> • The pentose phosphate pathway . <i>Steps of oxidative and non-oxidative phase, location, regulation, importance.</i>
9 .	<ul style="list-style-type: none"> • Blood sugar level and its regulation . <i>Physiological values of blood sugar level. Hormonal regulation of blood sugar level, intracellular regulatory mechanisms, signaling pathways. Transporters of glucose circulation.</i>
10 .	<ul style="list-style-type: none"> • Metabolism of fructose and galactose . <i>Synthesis and degradation of fructose. Synthesis of galactose, its entry in the synthesis of lactose and mucopolysaccharides, galactolysis.</i> • Biochemistry of milk production . <i>The components of milk. Synthesis of lactose, milk proteins and milk fat.</i>
11 .	<ul style="list-style-type: none"> • Oxidative deamination of amino acids . <i>Oxidative deamination of L- and D-amino acids.</i> • Fate of the nitrogen-free carbon chain of amino acids . <i>Glucogenic and ketogenic amino acids .</i> • Transamination of amino acids . <i>Transamination reactions in general, AST, ALT. Production of Schiff-base and the mechanism of transamination.</i>

12	<ul style="list-style-type: none"> • Essential and non-essential amino acids . • Decarboxylation of amino acids . Biogenic amines and their degradation . • Biochemistry of glutathione, gamma-glutamyl cycle . Carnosine and anserine .
13	<ul style="list-style-type: none"> • Detoxification of ammonia. <i>Urea cycle (steps, location, regulation, energy balance, importance). Alternative detoxification pathways.</i>
14	<ul style="list-style-type: none"> • Synthesis and degradation of purine nucleotides . <i>De novo synthesis, degradation, resynthesis, metabolism of deoxyribonucleotides.</i>
15	<ul style="list-style-type: none"> • Synthesis and degradation of pyrimidine nucleotides . <i>De novo synthesis, degradation, resynthesis, metabolism of deoxyribonucleotides.</i>
16	<ul style="list-style-type: none"> • Structure and biochemical role of haemoglobin . • Synthesis of haemoglobin . <i>Steps, location, regulation, importance.</i>
17	<ul style="list-style-type: none"> • Degradation of porphyrines . • Myoglobin, cytochromes, catalase, peroxidase . • Iron metabolism .

18	<ul style="list-style-type: none"> • Absorbtion and circulation of lipids in the organism . • Lipolysis . <i>Steps, location, regulation, importance .</i> • Lipogenesis . <i>Steps, location, regulation, importance.</i>
19	<ul style="list-style-type: none"> • Degradation of fatty acids: beta-oxidation . <i>Transport of fatty acids into the mitochondrial matrix. Steps of beta-oxidation of fatty acids with even carbon atoms. Location, regulation, energy balance, importance. Specificities of beta-oxidation of unsaturated fatty acids and fatty acids with odd carbon atoms.</i>
20	<ul style="list-style-type: none"> • Synthesis of fatty acids . <i>Transport of acetyl~CoA to the cytoplasm. Steps of synthesis of fatty acids with even carbon atoms. Location, regulation, importance. Specificities of synthesis of unsaturated fatty acids and fatty acids with odd carbon atoms.</i>
21	<ul style="list-style-type: none"> • Ketogenesis, ketolysis . <i>Steps, location, energy balance, importance. Biochemical function of ketone bodies.</i>
22	<ul style="list-style-type: none"> • Biochemistry of cholesterol . <i>Structure, synthesis (steps, location, regulation, importance) and biochemical function of cholesterol .</i> • Biochemistry of bile acids . <i>Synthesis, circulation and biochemical function of bile acids.</i>
23	<ul style="list-style-type: none"> • Carbohydrate metabolism of ruminants . <i>Degradation of carbohydrates in the rumen, production, absorption and metabolism of volatile fatty acids in the organism.</i>
24	<ul style="list-style-type: none"> • Metabolism of nitrogen-containing compounds in ruminants . <i>Production and absorption of ammonia in the rumen. NPN agents, bypass proteins. Bacterial protein production in the rumen. Ruminohepatic nitrogen-circulation.</i>
25	<ul style="list-style-type: none"> • Biochemical background of ketosis in ruminants. <i>Connection between gluconeogenesis and ketogenesis. Development and features of ketosis.</i> • Lipid metabolism in ruminants . <i>Synthesis and degradation of lipids in the rumen. Characteristics of lipid metabolism of ruminants .</i>
26	<ul style="list-style-type: none"> • Central role of the liver in the intermediary metabolism . <i>Carbohydrate and lipid metabolism, metabolism of nitrogen-containing compounds. Secretion activity of the liver.</i>
27	<ul style="list-style-type: none"> • Detoxification activity of the liver. <i>Different detoxification processes: synthesis, hydrolysis, oxidation, reduction, conjugation. Operation of cytochrome P450 enzyme system.</i>

28	<ul style="list-style-type: none"> • Biochemistry of the muscles . <i>Mechanism of muscle contraction. Metabolism of muscles, types of muscle fibres.</i> • Biochemistry of adipose tissue, kidneys and brain .
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Topic group II .:	
1 .	Vitamins in general . Antivitamins . Vitamin antagonists .
2 .	Structure and metabolism of β -carotene and derivatives of retinol (vitamin A) .
3 .	Biochemical role and deficiency of retinol (vitamin A). Toxicity of vitamin A (hypervitaminosis) .
4 .	Structure and metabolism of calciferol (vitamin D) . Conversion of provitamin to calciferol .
5 .	Biochemical role and deficiency of calciferol (vitamin D). Toxicity of vitamin D (hypervitaminosis) .
6 .	Structure, metabolism and deficiency of tocoferol (vitamin E).
7 .	Biochemical role of tocoferol (vitamin E) . Oxidative stress, free radicals, antioxidants .
8 .	Structure and metabolism of phyloquinon (vitamin K) .
9 .	Biochemical role and deficiency of phyloquinon (vitamin K).
10	Biochemistry of essential fatty acids .
11	Structure and metabolism of thiamine (vitamin B1) .
12	Biochemical role and deficiency of thiamine (vitamin B1).
13	Structure and metabolism of riboflavin (vitamin B2).
14	Biochemical role and deficiency of riboflavin (vitamin B2).
15	Structure and metabolism of niacinamide (vitamin B3) .
16	Biochemical role and deficiency of niacinamide (vitamin B3).
17	Structure and metabolism of pantothenic acid (vitamin B5), synthesis of HS~CoA .
18	Biochemical role and deficiency of pantothenic acid (vitamin B5).
19	Structure and metabolism of pyridoxine (vitamin B6) .
20	Biochemical role and deficiency of pyridoxine (vitamin B6).
21	Structure, metabolism, biochemical role and deficiency of biotine (vitamin H).
22	Structure and metabolism of folic acid (vitamin B9) .

23	Biochemical role and deficiency of folic acid (vitamin B9).
24	Structure and metabolism of cobalamin (vitamin B12) .
25	Biochemical role and deficiency of cobalamin (vitamin B12).
26	Structure, synthesis and metabolism of ascorbic acid (vitamin C) .
27	Biochemical role and deficiency of ascorbic acid (vitamin C).
28	Biochemistry of lipotropic factors (choline, inositol) .

VETERINARY BIOCHEMISTRY COMPETITION:

At the end of the 2 . semester the traditional Veterinary Biochemistry competition is organized by the Department . The date of the competition (usually on the last week of the semester) will be published at the beginning of the semester . The competition is a written test, the material of the competition is the whole theoretical and practical curriculum of Veterinary Biochemistry with a particular emphasis on the connections and high-level application of them . The participation on the competition is voluntary, the tests are written anonym with a code word . A paper with name and code word is placed in a closed envelop by the student .

The announcement of results will take place until the first day of the exam period, where the envelopes containing the name of the best students will be opened in public and the students with the best results will be prized . In addition, students complete at least 70% on the competition are exempted from the written part of the exam with “excellent (5)” grade .

SAMPLE

3RD YEAR

SAMPLE

ANIMAL BREEDING

Subject	Animal Breeding
Specialization	Veterinary
Term of the subject	3 rd year 1 st semester (the 5 th semester in fall)
Number of lectures/semester practicals/semester	45 lectures/semester and 30 practicals/semester
Credit	5
Prerequisites	exam on Veterinary Genetics and extramural farm practice
Name of Department	Department for Animal Breeding, Nutrition and Laboratory animal science . Division of Animal Breeding and Genetics
Responsible teacher (email)	dr . habil . András Gáspárdy (gaspardy .andras@univet .hu)
Teacher(s) take part in teaching	dr . habil . András Gáspárdy, Prof . László Zöldág, dr . habil . Ákos Maróti-Agóts, Ph.D. Boglárka Vincze, Ph.D. Petra Zenke, László Szabára
Aim of subject	Husbandry guidelines for farm livestock, major hen species and pet (dog and cat) animals . An introduction to the characterization and utilization of main domestic animal species. To develop a basic understanding of specific purpose of animals under given cultural, economical and geographical condition .
Weekly schedule of lectures	
1 . week	Horse breeding introduction, Horse colour inheritance and genotyping
2 . week	Use of horses, traits, Breeding value estimation, horse breeding methods, improvement
3 . week	Horse breeds (warm blooded, cold blooded, ponies, types) and asses, Horse reproduction, genetic diseases
4 . week	Cattle breeding introduction, Dairy traits
5 . week	Breeding value estimation of dairy cattle, Beef cattle traits
6 . week	Breeding value estimation of beef cattle, Cattle reproduction and genetic diseases
7 . week	Methods of cattle breeding, Sheep and goat introduction
8 . week	Sheep and goat traits, Sheep and goat reproduction and genetic disease
9 . week	Sheep and goat breeding methods, Sheep and goat breeds
10 . week	Pig introduction, pig traits and breeding value estimation
11 . week	Pig breeds and breeding methods, Pig reproduction and genetic diseases
12 . week	Dog breeding, Dog reproduction and genetic diseases
13 . week	Cat breeding, Cat reproduction and genetic diseases
14 . week	Hen breeding (broiler production), Hen breeding (egg production)
15 . week	Turkey and pigeon breeding, Ducks and goose breeding

Recommended literature	
Obligatory	Zöldág, L. - Gáspárdy, A. – Maróti-Agóts, Á. – Buleca, J. – Seregi, J. – Matiuti, M. (2008): Veterinary genetics and animal breeding (ed . Zöldág László) . A/3 Printing Ltd ., Budapest, ISBN 978-963-88110-0-4 .
Recommended	
Type and method of exam:	
Exam within the exam period which consists of two (practical and theoretical) parts. At first, students are controlled by a questionnaire on computer (according to their rapid answers to basic figures, breeds, tools, wool samples and age determination) as a threshold to enter into the theoretical part . The performance from 60% is successful . And then, they choose four questions, and after a preparation time they answer these orally. All the four questions should be answered (a single unknown question leads to failure) . All questions are published in advance . In case of failed exam, students with at least 80% performance in computer test do not need to repeat the practical part .	
Note(s):	
<p>A preliminary summer farm practical (in the subject together with subject Animal Nutrition) is compulsory . A summer report, as well as a diary describing the daily activities shall be prepared and handed in by the beginning of the actual semester . Submission of them is a prerequisite for attendance of the subject and for exam on it .</p> <p>Responsible tutor of the class is Dr . Boglárka Vincze (vincze .boglarka@univet .hu), veterinarian . The teacher responsible for the subject (Dr . Gáspárdy András) gives through the up-to-date materials of the lectures and practical to the class representative on the course of the semester . The question lists for the practical as well as for the theoretical part of the exam are preliminary brought out (GAT.univet.hu, and on the Institutional homepage: www.univet.hu, respectively) . Three absences from the practical are allowed, but the re-take of them is compulsory . The presence is controlled on every occasion . On the course of a re-take student have to account for the knowledge of the missed practical by the lecturer who kept the practical/lab still during the semester .</p>	

ANIMAL NUTRITION I.

TOPICS OF THE LECTURES AND PRACTICALS, RULES, EXAM INFORMATION 2017 .

Duration of the semester	11 September - 15 December, 2017 (14 weeks) .	
Place of the subject	5 th semester (3 rd year) .	
Number of hours, lecture halls	Lectures: 2 hours/week (28 hours/semester), lecture hall: Béla TORMAY . Practicals: 2 hours/week (28 hours/semester), lecture hall: N/3 .	
	Topics of the lectures	Topics of the practicals
1 . week 11-15 Sept .	Introduction, chemical compounds of feeds (proximate analysis), fibre fractions (NDF, ADF, ADL) . Mr. István HULLÁR associate professor	Definition and classification of feedstuffs, mineral and vitamin supplements, manufactured feeds . Mr. András BERSÉNYI assistant professor
2 . week 18-22 Sept .	Generally about vitamins, fat soluble vitamins . Mr . Sándor György FEKETE full professor	Cereal grains and grain legumes . Mrs . Orsolya KUTASI-KORBACSKA assciate professor

3 . wee 25-29 Sept .	Energetic evaluation of feeds . Mr. István HULLÁR associate professor	Hay and haymaking, meadow hay, alfalfa hay . Ms. Nikoletta HETÉNYI DVM lecturer
4 . week 2-6 Okt .	Water soluble vitamins Mr . Sándor György FEKETE full professor	Pasture grasses, and harvested green forages . Straws, roots and tubers . Mrs. Éva CENKVÁRI senior research fellow
5 . week 9-13 Okt .	Regulation of the feed intake, nutrients' digestibility . Mr. István HULLÁR associate professor	Silage making . Maize silage . Mrs . Orsolya KUTASI-KORBACSKA associate professor
6 . week 16-20 Okt .	Earth alkali alkalinity, cation-anion balance (CAB), macrominerals . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Energetic evaluation of feeds . I . (monogastric animals) . By-products of starch industry and fruit processing . Mr. István HULLÁR associate professor
7 . week 23-27 Okt .	Homeostasis of minerals, control of mineral supply, microminerals . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Energetic evaluation of feeds . II . (ruminants) . Distillery and brewery byproducts . Ms. Nikoletta HETÉNYI DVM lecturer
8 . week 23 Okt .03 Nov .	Protein evaluation systems (monogastric animals + ruminants) . Mrs. Éva CENKVÁRI senior research fellow	Control of the mineral supply, calculation of the Cation-Anion Balance (CAB) Mr. András BERSÉNYI assistant professor
9 . week 06-10 Nov .	Microflora and -fauna in rumen and in gut . Interaction between the intestinal flora and feed: eubiosis, dysbiosis. Microbiology and mycology of feedstuffs. Mrs. Hedvig FÉBEL invited private professor	Nutrients' digestibility . By-products of sugar industry . Mr. István HULLÁR associate professor
10 . week 13-17 Nov .	Animal nutrition and food safety . Mr . Sándor György FEKETE full professor	Protein evaluation of feeds . I . (monogastric animals) . Milling byproducts of cereal grains . Mr. István HULLÁR associate professor
11 . week 20-24 Nov .	Growth promoters, nutraceuticals . Ms. Nikoletta HETÉNYI DVM lecturer	Protein evaluation of feeds . II . (ruminants) . Use of NPN (Non Protein Nitrogen) supplementation, Urea Fermentation Potential (UFP) . Antioxidants, amino acid and enzyme supplements . Mr. István HULLÁR associate professor
12 . week 27 Nov . -01 Dec .	Immunological aspects of animal nutrition . Mrs . Orsolya KUTASI-KORBACSKA associate professor	The Fill Unit System (UE), Substitution Number (SN), Index of Nutritional Quality (INQ) . Oilseed meals (solvent extracted) . Mr. András BERSÉNYI assistant professor
13 . week 04-08 Dec	Relationship between feeding and reproduction . Mr. András BERSÉNYI assistant professor	Feed sampling, feed microscopy . Feedstuffs of animal origin (fish meal, milk products) . Mrs. Éva CENKVÁRI senior research fellow

14 . week 11-15 Dec	Antinutritive substances in feeds, and antimetabolites . Deterioration of feeds (rancidity), warranty and guarantees . Microbial deterioration of feeds, mycotoxins . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Guidelines and rules for ration formulation . Ration formulation by computer . Mr. András BERSÉNYI assistant professor
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FURTHER INFORMATION

Attendance at lectures and practicals Lectures

According to the decision of the Faculty Council (14 November, 2006) attendances at lectures are also obligatory .

The acceptable numbers of uncertified absences are maximum 3 per semester. With more than three (3) recorded absences your semester is NOT going to be accepted for that subject, thus it has to be re-taken during a later semester for an additional fee in order to sit for the exam .

Absences because of clinical practices or research activity connected to the diploma thesis are not treated as uncertified absences, but these must be verified on the official certificate by the teacher or the tutor .

Practicals

The Department registers the attendance at the beginning of each single practical by using the official group assignment provided by the Student's Secretariat.

With more than 4 recorded absences your semester is NOT going to be accepted for that subject, thus it has to be re-taken during a later semester for an additional fee in order to sit for the exam . One practical per semester can be missed without any consequence . In case of more absences, the student has give an account of the subject of missed practical within 2 weeks at the lecturer of the topic . According to these no more than 4 missed practicals will be accepted from which accounts of 3 have to be given .

Group assignment

The Department uses the official group assignment provided by the Student's Secretariat. You can attend the lab you are registered for only. Due to efficiency and size of the groups it is not possible to attend any additional lab (including labs of different courses/years).

A permanent change to assignment may be requested but has to be approved by both the Department and the Secretariat .

Upon preliminary request the student might be allowed to switch exceptionally to a group other than registered in. Such a request, however, must be sent to the effected tutor at the latest one working day before the practical, until 12 pm (noon). Such a request should affect ONE practical only and will be evaluated on a case-by-case basis .

Contact person:

Mr. András BERSÉNYI assistant professor (Building J. 3rd floor, room 309; Phone: +361 478 4291 or from inside the University phone extension: 8643; e-mail: bersenyi .andras@univet .hu) . Should you have questions feel free to contact him . You are kindly requested NOT to address the head-ofdepartment or his secretary with teaching-related issues, unless you did not receive satisfactory answers to your inquiries by your contact person .

The “Animal Nutrition 1” exam

Exam period: 18-22 December, 2017, and 2 January-2 February, 2018 . **Prerequisites of**

the “Animal Nutrition 1” exam:

- handing in the nutritional summer report according to schedule;
- acceptance of the semester (lectures: absences above 3 are certified, practicals: accounts of the subjects of missed practicals above 1 were given) .

Possible forms of the “Animal Nutrition 1” exam

Written exam (test)

There is only 1 written exam possibility (test) within the whole exam period . The date of that will be determined according to the discussion with the students’ representative .

Registration for the written test from “Animal Nutrition 1”: according to the agreement made with the students’ representative the given date and the number of places will be set up, after that students can register themselves via NEPTUN .

The form of written test from “Animal Nutrition 1”: it is a simple choice test, which consists max . 80 questions . The net time for the test takes 60 minutes . Scoring of the test is as follows .

Mark	%
excellent (5)	90-100
good (4)	80- 89
fair (3)	70- 79
passing (2)	60- 69
failure (1)	0- 59

Please note that every year new tests will be compiled, consequently knowing the questions of the previous test does not guarantee the passing .

Oral exam

Those who

- do not want to do the exam in written form or
- cannot take part on the test or
- fail on the test, will get oral exam dates via NEPTUN.

Registration for the oral exam from “Animal Nutrition 1”: it can be done for the given exam dates via NEPTUN. Exam dates will be published through the NEPTUN shortly after the beginning of each academic semester .

Each and every exam organized by the Department will may come with an individual deadline for registration in the NEPTUN, therefore we strongly recommend students to verify that deadline at least one week prior to the exam, since it is not possible to make any changes once the registration period has been closed .

The form of oral exam from “Animal Nutrition 1”: each student gets 1-1 question from the following 3 question groups .

Fundamentals of animal nutrition .

Vitamins, minerals .

The oral exam from feedstuffs involves the identification of feed as well. Feeds to be identified will be available in the Student Center one week before the onset of the exam period .

Questions of the oral exam from “Animal Nutrition 1” (at the same time topics for the written test as well):

Fundamentals of animal nutrition	
1 .	Chemical analysis of feeds . I . Proximate analysis .
2 .	Chemical analysis of feeds . II . Fibre fractions (NDF, ADF, ADL) .
3 .	Energetic Evaluation of Feeds . I . Conception (GE, DE, ME, NEm, NEI, NEg, q-, k-, and i-values) .

4.	Energetic Evaluation of Feeds II . Monogastric animals (energy types, reasons of their use in different species).
5.	Energetic Evaluation of Feeds . III . Ruminants (energy types, reasons of their use in different species).
6.	Regulation of the feed intake, and the importance of its knowledge .
7.	The Fill Unit System (UE), Substitution Number (SN), Index of Nutritional Quality (INQ), and the importance of their knowledge .
8.	Nutrients' digestibility (definitions, methods for assessment).
9.	Protein evaluation systems . I . Monogastric animals .
10.	Protein evaluation systems . II . Ruminants (RDP, UDP, MP, MPN, MPE) .
11.	Microbiology and mycology of feedstuffs.
12.	Deterioration of feeds (rancidity), warranty and guarantees .
13.	Microbial deterioration of feeds, mycotoxins .
14.	Microflora and -fauna in rumen and in gut.

15.	Interaction between the intestinal flora and feed: eubiosis, dysbiosis.
16.	Antinutritive substances in feeds (classification, effects on animals), antimetabolites.
17.	Growth promoters, pro- and prebiotics (groups, mode of action, tendency of their use in the future) .
18.	Nutriceuticals .
19.	Animal nutrition and food safety (HACCP, BSE, dioxin, etc .) .
20.	Immunological aspects of animal nutrition .
21.	Relationships between feeding and reproduction .
Vitamins, minerals	
1.	Homeostasis of minerals, control of mineral supply .
2.	Earth alkali alkalinity, cation-anion balance of rations (FAA, AA, dUA, CAB), fields of practical application.
3.	Ca, P and Mg (biological functions, deficiency syndromes, requirements, their sources, control of supply) .
4.	S, Na, K and Cl (biological functions, deficiency syndromes, requirements, their sources, control of supply).
5.	Fe, Zn, Cu and Mn (biological functions, deficiency syndromes, requirements, their sources, control of supply).
6.	F, I, Co, Ni, Cr, Mo, Si (biological functions, deficiency syndromes, requirements, their sources, control of supply).

7.	Generally about vitamins (nutrition and diseases, recommendations, stability, role of rumen and gut flora, exploration of deficiencies, newly developed functions).
8.	Vit. A, beta-carotene and other carotinoids (biological functions, deficiency syndromes, requirements, their sources, control of supply) . .
9.	Vit . D and E, Se (biological functions, deficiency syndromes, requirements, their sources, control of supply).
10.	Vit . K and C (biological functions, deficiency syndromes, requirements, their sources, control of supply).
11.	Vit . B1, B2 and B6 (biological functions, deficiency syndromes, requirements, their sources, control of supply).
12.	Vit, B12, niacin and pantothenic acid (biological functions, deficiency syndromes, requirements, their sources, control of supply).
13.	Biotin, folic acid and cholin (biological functions, deficiency syndromes, requirements, their sources, control of supply).
Feedstuffs	
1.	Cereal grains (list, their approximate nutrient content) .
2.	Corn, wheat .
3.	Barley, oats .
4.	Grain legumes (list, their approximate nutrient content) .
5.	Oilseed (solvent) meals (list, their approximate nutrient content) .
6.	Full fat soybean, extracted soybean meal .
7.	Extracted sunflower meal, extracted rapeseed meal.
8.	Wheat bran, wheat germ .
9.	By-products of starch industry and fruit processing .
10.	By-products of sugar industry .
11.	Distillery and brewery by-products .
12.	Roots and tubers .
13.	Feedstuffs of animal origin (fish meal, milk products).
14.	Pasture grasses, and harvested green forages .
15.	Making silages .
16.	Maize silage (nutrient content, its use in animal nutrition) .
17.	Alfalfa hay .
18.	Meadow hay, wheat straw .
19.	Antioxidants, amino acid and enzyme supplements .
20.	Mineral and vitamin supplements .
21.	Use of NPN (Non Protein Nitrogen) supplementation, Urea Fermentation Potential (UFP) .
22.	Manufactured feeds .

Preparation for the “Animal Nutrition 1” exam

There are no prescribed textbooks . Any exam in “Animal Nutrition 1” will be based on the information given during lectures, and practicals. For preparations first of all your own notes, and the handouts of lectures and practicals are recommended . For further reading see the books listed below .

RECOMMENDED LITERATURE

FEKETE, S . Gy . (Ed .), 2008: Veterinary Nutrition and Dietetics . Fac . Vet . Sci .,Szent István Univ ., Budapest .

KELLEMS, R . O ., CHURCH, D . C .: Livestock Feeds and Feeding . Prentice Hall, Upper Saddle River, New Jersey, 5th Edition, 2002 .

Extra exam possibility for inactive students during the semester (out of the regular exam period)

Inactive students can get only one exam possibility during the semester (out of the exam period) even if they have more missing exams (e .g . “Animal Nutrition 1”, or “Calculation Test”, or “Animal Nutrition 2”) . The exams remained above that one can be done in the regular exam period only .

These students will be examined according to the actual question lists .

Extra exam possibilities for “older” active students

Those who are active but should have passed the animal nutrition exam(s) earlier, are allowed to be examined from 1 December 2017 only (see the the exam rules of the university) according to the actual question lists .

Rules valid for the former German students

Those German students who have already passed the exam “Futtermittelkunde” will be exempted from studying the feeds again, which means that they

- will be exempted from those parts of the practicals which deal with feeds, consequently
- neither the test nor the oral exam made from “Animal Nutrition 1” consist the topic “feedstuffs”.

ANIMAL NUTRITION I.

TOPICS OF THE LECTURES AND PRACTICALS, RULES, EXAM INFORMATION
2017 .

Duration of the semester	5 February – 18 May, 2018 .	
Place of the subject	6 th semester (3 rd year) .	
Number of hours, lecture halls	Lectures: 3 hours/week, places: Tormay (on Mondays) and Hetzel (on Tuesdays) lecture halls . Practicals: 2 hours/week, place: Dept . of Obstetrics .	
Class representative	Thomas JUHÁSZ-DÓRA (e-mail: szie2015freshers@gmail .com) .	
	Topics of the lectures	Topics of the practicals
1 . week 05-09 Feb . .	Digestive physiology of swine, piglet weaning systems . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Overview of the main subjects from the previous semester . Mr. István HULLÁR associate professor
2 . week 12-16 Feb .	Feeding and nutrition of healthy rabbits . The Most Important Nutritional Troubles of Rabbit .	ummary of the calculations I . Mr. István HULLÁR associate professor
3 . wee 19-23 Feb .	Fattening of pigs, Feeding breeding gilts, sows and barrows . Special questions of swine nutrition . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Feeding practice of rabbits Ms. Nikoletta HETÉNYI lecturer
4 . week 26 Feb . -2 Mar	Feeding and nutrition of healthy dogs and cats . (2 hours) Mrs . Orsolya KUTASI-KORBACSKA associate professor Non-infectious abortions . (1 hour) Mr . Sándor György FEKETE full professor	Feeding practice of swine . Mrs . Orsolya KUTASI-KORBACSKA associate professor
5 . week 05-09 Mar .	Nutrition and dietetics of horses . Mrs . Orsolya KUTASI-KORBACSKA associate professor	Commercial diets for dogs and cats . Mr. András BERSÉNYI assistant professor
6 . week 12-16 Mar .	Applied digestive physiology of ruminants . Compounds having advantageous effects on rumen function and metabolism . Feeding and nutrition of dairy calves . Mrs. Hedvig FÉBEL invited private professor	Feeding practice of horses Mrs . Orsolya KUTASI-KORBACSKA associate professor

7 . week 19-23 Mar	Beef heifer rearing systems, nutrition of dairy cows . Fattening of beefs, nutritional extension service (The most important metabolic troubles of periparturient dairy cow, and their prevention; Measurement of the milk urea level, its role in the herd diagnosis, practical applications; herd and individual diagnosis based on milk and urinary keton bodies in dairy cattle, ketonuric index) . Mr. András BERSÉNYI assistant professor	Feeding practice of grazing ruminants . Mrs. Éva CENKVÁRI senior researcher
8 . week 26-30 Mar	SPRING HOLIDAY	SPRING HOLIDAY
9 . week 2-6 Apr .	Dairy heifer rearing systems, nutrition of dairy cows and dry cows . Mrs. Éva CENKVÁRI senior researcher	Feeding practice of beef cattle . Mr. András BERSÉNYI assistant professor
10 . week 9-13 Apr . .	Dog and cat dietetics . I . Mr . Sándor György FEKETE full professor	Feeding practice of dairy cows I .: the basal diet + milking concentrate system . Mrs. Éva CENKVÁRI senior researcher
11 . week 16-20 Apr	Dog and cat dietetics II . Mr . Sándor György FEKETE full professor	Feeding practice of dairy cows II .: total mixed ration . Mrs. Éva CENKVÁRI senior researcher
12 . week 23-27 Apr	Digestive physiology of poultries and its nutritional consequences . Nutrition of meat producing poultries: broiler chicks, roasting ducks . Mr. István HULLÁR associate professor	Clinical dietetics of dogs and cats . Mr. András BERSÉNYI assistant professor
13 . week 30 Apr . -4 May	I . Nutrition of meat producing poultries: roasting geese, young meat geese, turkey hybrids . I . Nutrition of meat producing poultries: production of ducks' and geese' liver . Mr. István HULLÁR associate professor	Summary of the calculations . II . Mr. István HULLÁR associate professor
14 . week 7-11 May	III . Nutrition of egg producing poultries: chicken hybrids kept for egg production, breeding ducks, breeding turkeys, breeding geese . The most important metabolic troubles of poultry . Mr. István HULLÁR associate professor	Feeding practice of meat and liver producing poultries . Mr. István HULLÁR associate professor
15 . week 14-18 May	Nutrition of sheep and goats . The most important metabolic troubles of sheep and goats . Mrs . Éva CENKVÁRI senior researcher	Feeding practice of egg producing poultries . Dr. István HULLÁR associate professor

Attendance of classes

According to the university rules attendance at classes is obligatory. More than 30% of absence from an academic subject in a term results in an automatic exclusion from the semester, while the reason for being not present is irrelevant (*Students' Guide*, p. 6.).

According to that the acceptable number of uncertified absences from lectures is maximum 3 per semester . Above this level the Department of Animal Nutrition will refuse to recognise the semester and will not sign the student's black book . Absences because of clinical practices or research activities connected to the diploma thesis are not treated as uncertified absences, but these must be verified on the official certificate by the teacher or the tutor.

One absence from the practicals is acceptable without proof . In case of further absences, subjects of the practicals must be recited within 2 weeks at the lecturer of topic . No more than 4 missed practicals will be accepted from which 3 must be recited .

On behalf of the Dept. Anim. Nutr. the contact person is Dr. András BERSÉNYI assistant professor (Building J . 3rd floor, room 309; phone: +361 478 4291 or (on the area of the university) phone extension: 8643; e-mail: bersenyi .andras@univet .hu) .

Budapest, 5 February, 2018

István HULLÁR, assoc. professor head of Dept. Anim. Nutr.

SAMPLE

VETERINARY CLINICAL DIAGNOSTICS

Large Animal Practical Lessons 2017/2018, Semester 2

Thursday A: Groups 1-2-3-4 B: Groups 5-6-7-8

Duration of the practical lessons is 3×45 minutes .

The practicals start at 8 .30 AM for Groups 1-2 and 5-6, and at 11 .00 AM for Groups 3-4 and 7-8 at the Equine Clinic, Üllő, Dóra major.

	Topic	Group/Date	Lecturer
Pract . No . 1	Handling and restraining large animals . Safety regulations . Taking the signalment . Determining the basic clinical values. Studying different histories. Examination of the lymph nodes and the mucous membranes .	A: 22 February	
		B:15 February	
Pract . No . 2	Examination of the nose and the paranasal sinuses . Examination of the guttural pouch . Inducing cough in healthy and sick animals . Examination of the larynx and the trachea . Auscultation of the thorax . Percussion of the thorax, determination of the caudal lung border . Demonstration of respiratory endoscopy and thoracic ultrasonography .	A: 08 March	
		B: 01 March	
Pract . No . 3	Examination of the cardiovascular system . Demonstration of electrocardiography, evaluation of electrocardiograms . Demonstration of echocardiography in the horse .	A: 12 April	
		B: 22 March	
Pract . No . 4	Examination of the gastrointestinal system . Rectal examination . Demonstration of gastroscopy and abdominal ultrasonography .	A: 26 April	
		B: 19 April	
Pract . No . 5	Examination of the skin . Examination of the nervous and the musculoskeletal system . Clinical examination of patients .	A: 10 May	
		B: 03 May	
	Making up of missed practical lessons . Consultations . Strictly by appointment .	A: 14-18 May	
		B: 17 May	

Every practical starts with a short oral or written exam about the subject of the actual practical material . The group cannot be changed . Students should wear a coat during the practicals . A thermometer and a stethoscope from the first lesson, a pleximeter and a percussion hammer from the second practical are required for each student . Attendance at the practical lessons is obligatory; only 1 missed practical can be made up during the last week, only by appointment .

Budapest, 10 January 2018

VETERINARY CLINICAL INTERNAL DIAGNOSTICS

Practical lessons of small animals 2017/18 II . term .

Thursday 1; 5 . gr . 8 .15-11 .00

A:1-2-3-4 groups

B: 5-6-7-8 groups

2; 6 gr . 11 .15-14 .00

3; 7 gr . 14,15-17,00

4; 8 gr . 17 .15-20 .00

Date	Teacher	Subject
02/15 A 02/22 B	MÁ/ BÉ/FF	Handling and restraining of dogs and cats . Safety regulations . Taking the signalment, nationale . Determining the basic clinical values. Studying different histories, anamnesis.
03/01 A 03/08 B	AZS/PR/SÁ	Examination of the mucous membranes and the lymph nodes of dogs and cats . Examination of the respiratory system of small animals: Examination of the nose and the nasal cavities . Inducing cough in healthy and sick animals . Examination of the larynx and the trachea . Auscultation over the larynx, trachea and thorax of healthy and sick animals . Percussion of the thorax .
03/22 A 04/12 B	MF/ VK/KG	Examination of the cardiovascular system of healthy and sick dogs and cats. Evaluating the findings of the ECG examination.
04/19 A 04/26 B	VZS/SÁ/ (AZS)	Examination of the urinary system of the small animals . Examination of the gastrointestinal system of dogs and cats . Examination of the locomotor system of healthy and sick dogs and cats .
05/03 A 05/10 B	SÁ/MÁ	Examination of the nervous system of small animals Examination of the skin Practicing the clinical examination of dogs and cats .
05/17 A 05/14- 18 B	SÁ	Replacement of the missing practices .Consultations . Appointment is necessary

Teachers: MF - Ferenc Manczur VK -Vörös Károly
SÁ - Ágnes Sterczer MÁ -Ákos Máthé
VZS -Zsuzsanna Vizi AZS -Zsófia Aradi
PR -Psader Roland BÉ -Balogh Éva

The practical lessons take place in the teaching unit of the obstetrical department, building M

The attendance at the practical lessons is obligatory . Can not be changed the group! A making up for a missed practical lesson is only possible in a case of special situation and appointment is necessary . The students should wear a coat in every practice . A thermometer and a phonendoscope from the first lesson, a plessimeter and a percussion hammer from the second practice are required for each student . Every practical starts with a short oral or written exam from the subject of the actual practical material .

Budapest, January 15 . 2017 .

Dr. Ágnes Sterczer
associate professor

VETERINARY CLINICAL INTERNAL DIAGNOSTICS

Lectures 2017/18 Semester 2

Tuesday, 8 .15-9 .00

Wednesday, 8 .15-10 .00

Topic	Teacher	Hours	Date
The aim and methods of the clinical examination of different organs .	Sterczer, Á.	1	06 . February .

The different types of diagnoses. Documenting the results of the clinical examinations . Signalement (Nationale) .	Sterczer, Á.	2	07 . February
How to take the history (anamnesis), parts of the history . Parts of the status praesens . General impression .	Sterczer, Á.	1	13 . February
Basic clinical data . Examination of the lymph nodes and mucous membranes .	Sterczer, Á.	2	14 . February
Examination of the respiratory system I .: upper airways .	Sterczer, Á.	1	20 . February
Examination of the respiratory system II: pharynx, larynx . Inspection and palpation of the thorax . Respiratory movement, respiration . Dyspnoe .	Sterczer, Á.	2	21 . February
Examination of the respiratory system III . Examination of the respiratory system by auscultation .	Psader, R .	1	27 . February
Examination of the thorax by percussion . Respiratory endoscopy	Vörös, K . Psáder, R	1 1	28 . February
Examination of the lymph nodes, mucous membranes and respiratory system in large animals .	Bakos, Z .	1	06 . March
Examination of the respiratory system in large animals . Examination of the cardiovascular system I .	Bakos, Z . Manczur, F	1 1	07 . March
Examination of the cardiovascular system II .	Vörös, K .	1	13 . March
Examination of the cardiovascular system III Examination of the cardiovascular system IV .	Vörös, K . Manczur, F .	1 1	14 . March
Blood pressure measurement	Manczur, F .	1	20 . March
Electrocardiography Diagnostic ultrasound (principles and methods) . Echocardiography	Manczur F . Vörös, K .	1 1	21 . March
Examination of the cardiovascular system in large animals	Bakos, Z	1	03 . April
Introduction into the examination of the digestive system . Examination of the canine and feline digestive system	Sterczer Á	1	10 . April
Examination of the digestive system of ruminants . Examination of the digestive system of the swine .	Abonyi, T .	2	11 . April
Examination of the digestive system of the horse	Bakos, Z .	1	17 . April
Ultrasonography of the abdominal organs . Gastrointestinal endoscopy	Manczur, F Psader, R	1 1	18 . April

Examination of the urinary system .	Manczur, F	1	24 . April
Examination of the genital organs, the hormonal glands and the spleen	Vizi, Zs	1	25 . April
Examination of the locomotor system	Balogh É	1	
Examination of the nervous system I .	Máthé Á.	2	02 . May
Examination of the nervous system II .	Máthé Á.	1	08 . May
Examination of the nervous systemIII	Máthé, Á.	2	09 . May
Examination of the nervous system of the horse	Bakos, Z .	1	15 . May
Examination of the skin	Tarpataki, N	2	16 . May

Budapest, 04 . January 2018

Dr. Sterczer Ágnes
associate professor

SAMPLE

LABORATORY DIAGNOSTICS

Subject:	Laboratory Diagnostics
Specialization:	veterinary
Term of the subject:	3 rd year, 5 th semester
Number of lectures/semester practicals/semester	30 hours practicals
Credit:	2
Prerequisites:	“Anatomy 3 . completed .” AND “Histology 2 . completed .” AND “Physiology 2 . completed .” AND “Biochemistry 2 . completed .”
Place of lectures/ semesters, practicals	Building O – the practical room of the Department of Pathophysiology and Oncology
Name of Department:	Department of Pathophysiology and Oncology
Responsible teacher (email):	Dr . Péter Vajdovich (Vajdovich .peter@aotk .szie .hu)
Teacher(s) take part in teaching:	Dr . Krisztina Kungl (contact person for students: Kungl . krisztina@aotk .szie .hu), dr . Bálint Tóth, dr . Péter Vajdovich
Aim of subject:	To provide general knowledge about laboratory methods, and parameter specific knowledge: when a parameter should be requested, what lab method is used to determine the given parameter, what is the reference range, interpretation of abnormal results, causes of bias
Weekly schedule of practicals (the order is not final, the detailed schedule is found in another document!) Name of teacher – all practicals are held by all teachers according to the group split	
1 . week	Isovolaemia, isoosmosis: PCV, ion concentrations
2 . week	Isohydria: acid-base balance, blood gas analysis
3 . week	Haemostasis tests
4 . week	Examinations on metabolic disorders
5 . week	Evaluation of red blood cells
6 . week	Evaluation of inflammation and white blood cells
7 . week	Examination of the body cavity fluids and the cerebrospinal fluid
8 . week	Examination of ruminal fluid
9 . week	Examination of the intestinal function and the exocrine pancreas
10 . week	Examination of the liver 1 .
11 . week	Examination of the liver 2 .
12 . week	Examination of the kidney function

13 . week	Urinalysis
14 . week	Examination of endocrine disorders
15 . week	Retakes of practicals
Recommended literature	
Obligatory:	Lecture notes in the folder available for students on the web site of the department/faculty . Elizabeth Villiers (Editor), Laura Blackwood (Editor) .BSAVA Manual of Canine and Feline Clinical Pathology, 2nd Edition . ISBN: 978-0-905214-79-5 . 464 pages, April 2005
Recommended:	Veterinary Haematology and Clinical Chemistry, Mary Anna Thrall, Glade Weiser, Robin Allison, Terry W . Campbell, John Wiley & Sons, 2012 .
Type and method of exam:	
<p>Prerequisite: attendance on the practicals (max . 3 absences, which must be retaken), submission of all essays, positive result on both midterms (these are written essays) .</p> <p>Type of exam: oral/practical</p> <p>Method of exam: 1 question is drawn, if the question involves quick tests, these should be performed . The following should be presented about each involved parameter: when should it be assessed, what lab method is used to test it, what is the average normal range and the unit of measurement, which pathological conditions cause abnormal results, what are the most frequent biases/misinterpretations .</p>	
Grading scheme:	
<p>excellent: 86-100%</p> <p>good: 76-85%</p> <p>satisfactory: 66-75%</p> <p>passing: 51-66% failed: 0-50%</p>	
Note(s):	
<p>All other important info (e .g . retakes, materials) can be found in the GENERAL INFO SHEET for Laboratory diagnostics on the department website and will be distributed through the year representative . To the practicals students must come prepared from the material of the given day . Oral or written questioning occurs on every practical .</p> <p>It is not possible to change the date of the midterms (the dates were adjusted with the students secretariat) .</p>	

PARASITOLOGY I.

2017/2018 Second Semester

Programme of lectures	
05 Febr	Introduction to parasitology . Taxonomy of Protozoa . „SARCOMASTIGOPHORA”
06 Febr	Tropical trypanosomoses, dourine

12 Febr	Leishmaniosis . Giardiosis . Bovine and avian trichomonosis
13 Febr	Histomonosis . Amoeboses
19 Febr	APICOMPLEXA. Eimeriidae: coccidiosis of the chicken
20 Febr	Control of chicken coccidiosis, coccidiosis of other birds
26 Febr	Coccidiosis of the horse, cattle, small ruminants, rabbit, pig, carnivores
27 Febr	Cryptosporidiosis
05 March	Toxoplasmosis . Neosporosis
06 March	Hammondiosis . Besnoitiosis . Sarcocystiosis I .
12 March	Sarcocystiosis II . Klossiellosis . Hepatozoonosis . Malaria . Haemoproteosis . Leucocytozoonosis
13 March	Babesiosis
19 March	Theileriosis . Cytauxzoonosis . MICROSPORA: encephalitozoonosis . CILIOPHORA: balantidiosis . Blastocystiosis
20 March	Summarizing review of protozoa
03 April	Introduction to veterinary entomology . Lice
09 April	Fleas.Bugs. Darkling beetle. Mosquitoes. Blackflies. Biting midges. Sandflies
10 April	Horse- and deerflies. Tsetse flies. Forest flies
16 April	Muscoid flies
17 April	Myiasis-causing fly species. Traumatic myiasis
21 April	Hypodermosis . Gasterophilosis . Oestrosis . Mange mites I .
23 Apr	Mange mites II .
24 Apr	Demodectic mites
07 May	Soft and hard ticks
08 May	Cheyletiella, red and other mites . The tongue worm
14 May	Control of arthropods
15 May	Summarizing review of arthropods infesting domestic animals

Programme of practicals

05 Febr . – 09 Febr .	Basic terms . Diagnostic techniques in protozoology
12 Febr . – 16 Febr .	Trypanosomosis, leishmaniosis, giardiosis, trichomonosis, histomonosis (T)
19 Febr . – 23 Febr .	Investigation of coccidia, coccidiosis of chicken, goose (T)

26 Febr . – 02 March .	Coccidiosis of cattle, rabbit, pig and carnivores (T)
05 March – 09 March .	Cryptosporidiosis, toxoplasmosis, besnoitiosis of cattle, sarcocystiosis (T)
12 March – 16 March .	Hepatozoonosis of dog, babesiosis, theileriosis, encephalitozoonosis (T)
19 March – 23 March .	Practical examination
26 March . – 29 March	Eastern Holidays
03 Apr . – 06 Apr .	Examination for arthropods of veterinary importance. Lice, fleas (T)
09 Apr . – 13 Apr .	Bugs, beetle, horse- and deerflies, tsetse flies, forest flies, the sheep ked (T)
16 Apr . – 20 Apr .	Mosquitoes, blackflies, biting midges, sandflies, muscoid flies, traumatic and other myiasis (T)
23 Apr . – 27 Apr .	Mange (T)
30 Apr . – 04 May .	Demodectic mites, soft and hard ticks and other mites (T)
07 May – 11 May	Practical examination
14 May – 18 May	Summarizing review of protozoa and arthropods

T= written test of the practical

Budapest, 5 February 2018

Róbert Farkas

curator

PATHOLOGY A

Program of the General Pathology practicals 2017

5th semester (30 hours / small group practicals 2×45 minutes per week) **Major aim**

of the practicals:

- Exercising the dissection technique of different species.
- Diagnostic work, recognizing postmortem changes .
- Describing normal and pathologic changes of the organs .

Semifinal exam questions on General Veterinary Pathology

- | | |
|-----|--|
| 1 . | Objective, task and investigation methods of pathology |
|-----|--|

- Methods of collection and submission different specimens for laboratory investigations, sending samples to a laboratory .

2 .	Disease
WEEK TOPIC	
1 . week	(no practical)
2 . week	General knowledge about the dissection . (Safety in the dissection room . Tools of the dissection) . Description of the carcass . External and internal examination of the carcasses (Until opening the abdominal cavity .)
3 . week	Internal examination: dissection of the abdominal organs .
4 . week	Internal examination: dissection of the oral, cervical and thoracic organs .
5 . week	Internal examination: dissection of the urogenital organs on a male . (Discussion of the similarities and differences with a female.)
6 . week	Internal examination: dissection of the nasal cavity, skull (brain), spinal column (spinal cord) . (General practice)
7 . week	Internal examination: dissection of the peripheral nerves, eyes, ears, bones, joints . (General practice)
8 . week	HOLIDAY (no practical)
9 . week	General practice . Presentation of concrements and pseudoconcrements .
10 . week	Dissection of rabbits .
11 . week	General practice . Presentation of the endocrine glands .
12 . week	General practice . Dissection of ruminants and horses theoretically
13 . week	General practice . Dissection of fetuses, fetal membranes, newborn animal carcasses .
14 . week	General practice . Sending samples to a laboratory
15 . week	EXAM

Recommended literature for the practical exam:

VETÉSI F., MÉSZÁROS J. (1994): Autopsy of domestic animals (Mammals and birds).
Lecture notes, University of Veterinary Science

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3.	Death
4.	PM changes
5.	Traumas and their consequences
6.	High temperature as cause of disease
7.	Low temperature as cause of disease
8.	Irradiations and electricity (also lightning) as cause of disease
9.	Inadequate oxygen and water supply
10.	Inadequate nutrient supply . Starvation
11.	Autointoxication
12.	Internal conditions of disease
13.	Bacteria, viruses and fungi as cause of disease
14.	Spread of the pathological processes in the organism . Septicaemia, sepsis, bacteraemia
15.	Degenerative changes of cells and tissues
16.	Local hyperaemia
17.	Local oligoemia (ischaemia)
18.	Hemostasis, shock
19.	Hemorrhage
20.	Thrombosis
21.	Embolism
22.	Disturbances in water balance of the organism (Edema)
23.	Disturbances in water balance of cells
24.	Disturbances in fat metabolism

25 .	Disturbances in carbohydrate metabolism
26 .	Pathological mucus production and pathological changes in the mucosubstance
27 .	Disturbances in keratinization
28 .	Uricosis (Gout)
29 .	Hyalinosis, fibrinoid necrosis
30 .	Amyloidosis
31 .	Pathologic pigmentation caused by hemoglobin and haemosiderin
32 .	Pathologic pigmentation caused by hematoidin, and bilirubin
33 .	Pathologic pigmentation caused by porphyrins
34 .	Pathologic pigmentation caused by melanin, lipofuscin, and ceroid
35 .	Exogenous pigments
36 .	Concretions (lithiasis) and pseudoconcretions
37 .	Necrosis . Apoptosis
38 .	Gangrene
39 .	Pathological calcification
40 .	About the regeneration in general, removal of the necrotic tissues
41 .	Proliferative changes during regeneration. Fibrosis, elastosis, fibroelastosis, reticulosis, cirrhosis
42 .	Organisation, demarcation
43 .	Regeneration of epithelial tissue
44 .	Regeneration of muscle and neural tissue

45 .	Regeneration of connective tissue and blood vessels . Wound healing
46 .	Metaplasia, pseudometaplasia
47 .	Atrophy
48 .	Accommodation (hypertrophy, hyperplasia, transformation)
49 .	Vascular changes and exudation in the acute inflammation
50 .	Infiltrative processes during acute inflammation
51 .	Proliferative processes during inflammation.
52 .	Serous, catarrhal, haemorrhagic and ichorous inflammation
53 .	Suppurative inflammation
54 .	Fibrinous inflammation
55 .	Inflammation in organs without blood vessels. The inflammation-organism relationship (beneficial and harmful effects of inflammation; outcome of the acute inflammation, systemic signs of acute inflammation)
56 .	Necrotizing and proliferative inflammation
57 .	General characteristics of the granuloma formation
58 .	Tuberculum . Predominantly exudative and predominantly proliferative tuberculosis
59 .	Factors influencing the character of tuberculosis
60 .	General pathogenesis of tuberculosis
61 .	Actinobacillosis, actinomycosis
62 .	Granulomas caused by fungi
63 .	Granulomas caused by chemicals and other granulomas
64 .	Disturbances in cell division
65 .	Causes of developmental anomalies (formal and causal genesis)
66 .	Main forms of developmental anomalies

67 .	Definition of tumor (oncogenes, tumorsuppressor genes)
68 .	Terminology and classification of tumors (benign, semimalignant tumors, in situ carcinoma, malignant tumors, preneoplastic changes, tumor-like lesions)
69 .	The general macro- and microscopic morphology of tumors . The increase in volume of tumor cells and tumoral proliferations
70 .	Tumor-induced angiogenesis (capillary incorporation, budding of endothelial cells)
71 .	Carcinogenesis (chemical and physical agents)
72 .	Carcinogenesis (biological agents)
73 .	The tumor-organism relationship (tumor progression, heterogeneity, metabolism of tumor cells, cancer anorexia-cachexia syndrome, paraneoplasia, tumor immunity)
74 .	Metastasis
75 .	Benign mesenchymal tumors
76 .	Malignant mesenchymal tumors
77 .	Melanocytic tumors, the important tumors of nervous tissue . Mixed tumors
78 .	Benign epithelial tumors
79 .	Malignant epithelial tumors
80 .	Tumors of vascular tissues (blood and lymph vessels)
81 .	Hemolymphatic tumors in mammals
82 .	Rules of collecting and sending specimens for pathological and for other supplementary examinations
83 .	Basic principles and technique of histopathological examinations . Light microscopy .
84 .	Professional and formal aspects of writing a post mortem report

Dr. Míra Mánodki
Associate Professor,
Head of the Department

GENERAL PATHOLOGY LECTURES

2017/2018 . 1st semester: 11th September – 15th December

III . year, Zimmermann (Anatomy) lecture hall

4 hours / week

(Wednesday 8 .15-10 .00 and Thursday 10:15-12:00)

Week	TIME	TOPIC	LECTURER
37 th	Sept . 13 .	Object, task and investigation methods of pathology . Disease and death .	Dr . Gyula Balka
	Sept . 14 .	Postmortem changes . Traumas and their consequences . High and low temperature as cause of disease .	Dr . Míra Mándoki
38 th	Sept . 20 .	Irradiations, electricity . Inadequate oxygen and water supply . Inadequate nutrient supply, starvation as cause of disease .	Dr . Míra Mándoki
	Sept . 21 .	Autointoxication . Internal conditions of disease . Bacteria, viruses and fungi as cause of disease .	Dr . Csaba Jakab
39 th	Sept . 27 .	Edema, disturbances in water balance of cells and the organism . Disturbances in fat metabolism .	Dr . Míra Mándoki
	Sept . 28 .	Disturbances in carbohydrate metabolism, pathology of the diabetes mellitus . Pathological mucus production and pathological changes in the muco-substance . Disturbances in keratinization .	Dr . Imre Biksi
40 th	Oct . 4 .	Local hyperemia, local oligemia (ischemia), hemostasis, shock .	Dr . Gyula Balka
	Oct . 5 .	Hemorrhage . Thrombosis, embolism .	Dr . Gyula Balka
41 st	Oct . 11 .	Necrosis, apoptosis, gangrene. Pathological calcification.	Dr . Ildikó Erdélyi
	Oct . 12 .	Pathologic pigmentation . Concrements and pseudoconcrements .	Dr . Míra Mándoki
42 nd	Oct . 18 .	Uricosis (gout) . Hyalinosis, fibrinoid necrosis. Amyloidosis.	Dr . Imre Biksi
	Oct . 19 .	Spread of the pathological processes in the organism, septicemia, sepsis, bacteriemia . Regressive changes: reversible and irreversible cellular and tissue changes .	Dr . Gyula Balka
43 rd	Oct . 25 .	About regeneration in general . Remotion, resorption . Proliferative processes: fibrosis, fibroelastosis, elastosis, reticulosis .	Dr . Ildikó Erdélyi
	Oct . 26 .	Regeneration of neural tissue, connective tissue and vessels . Wound healing .	Dr . Gyula Balka
44 th	Nov . 1 .	All Saints' Day (holiday) -	

	Nov . 2 .	Metaplasia, pseudometaplasia, dysplasia, hypertrophy, hyperplasia . Transformation . Atrophy .	Dr . Gyula Balka
45 th	Nov . 8 .	Inflammation. Etiology, terminology. Vascular changes and exudation. Infiltrative and proliferative processes. Mediators .	Dr . Csaba Jakab
	Nov . 9 .	Inflammation in organs without blood vessels. Beneficial and harmful effects; outcome and systemic sings of acute inflammation. Granulomas in general .	Dr . Csaba Jakab
46 th	Nov . 15 .	Exudative inflammation. Alterative and proliferative inflammation.	Dr . Míra Mándoki
	Nov . 6 .	General pathogenesis of tuberculosis, tuberculum, predominantly exudative and proliferative tuberculosis . Factors influencing the character of tuberculosis.	Dr . Gyula Balka
47 th	Nov . 22 .	Actinobacillosis, actinomycosis . Granulomas caused by fungi and chemicals . Glanders .	Dr . Gyula Balka
	Nov . 23 .	Disturbances in cell division . Developmental anomalies .	Dr . Gyula Balka
48 th	Nov . 29 .	General morphology of tumors . Growth and spread of tumors. Clinical effects of tumors in general	Dr . Csaba Jakab
	Nov . 30 .	Chemical oncogenesis . Viral oncogenesis . Physical agents associated with neoplasia . Classification and nomenclature of tumors. Metastasis .	Dr . Csaba Jakab
49 th	Dec . 6 .	Benign and malignant tumors of different tissues. I.	Dr . Csaba Jakab
	Dec . 7 .	Benign and malignant tumors of different tissues. II.	Dr . Ildikó Erdélyi
50 th	Dec . 13 .	Sending specimens . Histopathology . PM report	Dr . Csaba Jakab
	Dec . 14 .	Consultation	Dr . Míra Mándoki

Budapest, 29th August 2017 .

*Prof. Péter
Sótonyi Head of the
department*

SPECIAL PATHOLOGY 1.

**Timetable of the „Special Pathology 1 .” lectures
English 3rd year
Tuesday 15:15 – 16:00, Anatomy Lecture hall 5th
February – 18th May 2018 .**

Time	Lecture	Topic	Lecturer
6 . week: 06 . February	1 hour	Oral cavity	dr . Míra Mándoki

7 . week: 13 . February	1 hour	Oral cavity	dr . Gyula Balka
8 . week: 20 . February	1 hour	Teeth	dr . Jakab Csaba
9 . week: 27 . February	1 hour	Oesophagus, forestomachs	dr . Míra Mándoki
10 . week: 06 . March	1 hour	Stomach	dr . Jakab Csaba
11 . week: 13 . March	1 hour	Intestines	dr . Míra Mándoki
12 . week: 20 . March	1 hour	Intestines	dr . Gyula Balka
13 . week: 27 . March	Spring Holiday		
14 . week: 3 . April	1 hour	Intestines	dr . Míra Mándoki
15 . week: 10 . April	1 hour	Intestines	dr . Míra Mándoki
16 . week: 17 . April	1 hour	Intestines	dr . Gyula Balka
17 . week: 24 . April	1 hour	Intestines, pancreas	dr . Gyula Balka
18 . week: 1 . May	Holiday (Labor day)		
19 . week: 8 . May	1 hour	Liver	dr . Csaba Jakab
20 . week: 15 . May	1 hour	Liver	dr . Csaba Jakab

Budapest, 30th of January, 2018

Mándoki, Míra
Associate professor,
Head of the Department

SAMPLE

Examination questions of systematic veterinary PATHOLOGY 2018 .

1 .	Developmental anomalies of the oral cavity, teeth and intestine
2 .	Enantheas; different basic forms of stomatitis. Bovine papular stomatitis
3 .	Foot and mouth disease
4 .	Bovine viral diarrhea
5 .	Various organ lesions due to necrobacillosis and actinobacillosis
6 .	Lesions and complications of stachybotryotoxicosis in mammals
7 .	Abnormal wearing of teeth
8 .	Regressive changes of teeth; pulpitis, gingivitis and paradentitis
9 .	Stenosis, dilatation and lesions of continuity in the esophagus
10 .	Pathological changes due to vitamin-A deficiency in mammals
11 .	Dilatation and displacement of forestomachs, their lesions of continuity
12 .	Hyper- and parakeratosis of forestomachs and their consequences. Inflammation of forestomachs
13 .	Stenosis, dilatation and lesions of continuity of the stomach
14 .	Regressive changes in the stomach . Pathogenesis of gastric ulceration
15 .	Gastritis
16 .	Intestinal torsions, flexion, intussusception, (invagination), prolapsus, eventration, hernias
17 .	Intestinal stenosis and obstruction (ileus), intestinal dilatation and constipation .
18 .	Circulatory disturbances and thrombosis in the intestine .
19 .	Enteritides, basic forms
20 .	Enteric pathological manifestations caused by viruses (corona-, rota-, adeno- and parvoviruses) Pathological changes caused by parvovirus in carnivores
21 .	Enterotoxemia caused by Escherichia coli (calf, pig), oedema disease of swine; coli septicemia

22 .	Enterotoxemias caused by <i>Clostridium perfringens</i>
23 .	Septicaemic salmonella (<i>Salmonella choleraesuis</i>) infection of pigs . Swine typhus (<i>Salmonella typhisuis</i> infection)
24 .	Paratuberculosis (Johne's disease), mycobacterial lesions of the intestine
25 .	Intestinal coccidiosis in mammals . Mycosis in the intestinal tract
26 .	Swine fever (hog cholera) and its complications; African swine fever
27 .	Swine dysentery
28 .	Proliferative enteropathy of swine (PPE)
29 .	Enteral diseases of rabbits
30 .	Inflammations and tumors of the pancreas. Pathology of diabetes mellitus in dogs
31 .	Regressive changes and metabolic disturbances of the liver . Fatty liver syndrome in dairy cattle
32 .	Hepatocellular degeneration and necrosis (dystrophy of the liver); hepatosis dietetica in swine
33 .	Hepatitis . Viral and parasitic infections of the liver

34 .	Liver cirrhosis/fibrosis
35 .	Equine infectious anaemia
36 .	Developmental anomalies of the heart
37 .	Abnormal content in the pericardium; circulatory disturbances and pericarditis
38 .	Regressive changes in the heart muscle and their pathologic appearance . Myocarditis .
39 .	Endocarditis, endocardosis and their consequences . Organic heart changes (changes of the valves and orifices of the heart)
40 .	Changes of cavities and measurements of the heart; cardiomyopathies
41 .	Pathologic changes of the arteries (changes of continuity, stenosis, aneurism, regressive changes, different forms of inflammations)
42 .	Abnormal content of the abdominal cavity; peritonitis; feline infectious peritonitis; tumors of the peritoneum

43 .	Abnormal content of the thoracic cavity . Pleuritis
44 .	Lymphadenitis; accumulation of pigments and other materials in the lymph nodes
45 .	Circulatory disturbances in the spleen; splenomegalies . Anthrax
46 .	Splenitis . Aleutian disease of minks
47 .	Swine erysipelas; streptococcus septicaemia of pigs
48 .	Insufficiency of bone marrow; different types of anemias
49 .	Rhinitis (in general); different rhinitis of swine; malignant catarrhal fever
50 .	Tracheitis and bronchitis; infectious bovine rhinotracheitis
51 .	Atelectasis and emphysema of the lung
52 .	Circulatory disturbances of the lung; pulmonary edema . Fumonisin toxicosis in horse and swine
53 .	Different forms of pneumonias (catarrhal, fibrinous, aspiration, interstitial, suppurative and embolic) . Mycotic pneumonias
54 .	Pathomorphological properties of bovine viral pneumonias
55 .	Bacterial pneumonias of cattle . Lung tuberculosis of cattle
56 .	Viral pneumonias of swine
57 .	Bacterial pneumonias of swine
58 .	Pneumonias of small ruminants . Tumors of the ovine respiratory tract
59 .	Pneumonias of horses . Malleus . Pathological changes due to Rhodococcus equi infection in horses
60 .	Pneumonias of carnivores and rabbits
61 .	Glomerulonephrosis
62 .	Ischemic and nephrotoxic tubulonephrosis . Chronic copper toxicosis in sheep .
63 .	Storage-type nephrosis; tubulonephrosis due to concrement formation
64 .	Patho- and morphogenesis of different forms of glomerulonephritis (GNs). Exudative glomerulonephritis
65 .	Non-purulent interstitial nephritis; nephritis caused by mycobacteria
66 .	Purulent nephritis and pyelonephritis
67 .	Renal fibrosis; chronic renal diseases
68 .	Hydronephrosis, pyelitis

69 .	Nephrolithiasis and related diseases
70 .	Pathologic lesions of the urinary bladder . Urocystitis
71 .	Fluid accumulation in the testis and epididymis . Regressive changes of the testis . Tumors of the testes and the penis
72 .	Orchitis, epididymitis
73 .	Ovarial cysts; inflammation of the ovary and oviducts in mammals
74 .	Different forms of endometritis and metritis
75 .	Death of embryo and foetus; abortion in general
76 .	Infectious abortions of sheep and cattle
77 .	Infectious abortions of swine and rabbits . Fusariotoxicosis of swine
78 .	Infectious abortions of horses . Equine rhinopneumonitis and equine infectious arteritis
79 .	Different forms of mastitis (in general). Mastitis acuta gravis
80 .	Osteopathies (rickets, osteomalacia, osteoporosis, osteodystrophia fibrosa)
81 .	Regressive and proliferative changes of bones
82 .	Osteomyelitis, periostitis, osteitis
83 .	Arthrosis; regressive changes of the cartilage of the joints
84 .	Regressive and inflammatory changes of muscles
85 .	Arthritis; tendinitis . Arthritis of swine, cattle and small ruminants
86 .	Developmental anomalies of the brain and spinal cord
87 .	Dilatation of the cavities of the brain and spinal cord
88 .	Regressive changes of the brain and spinal cord (in general) . Diseases with regressive changes of the central nervous system in mammals (transmissible encephalopathies)
89 .	Encephalitis, myelitis in general; different forms of encephalitis caused by viruses
90 .	Rabies . Borna disease; porcine enteroviral encephalomyelitis (Talfan disease; Teschen disease)
91 .	Aujeszky's disease in different species, especially in swine
92 .	Circulatory disturbances of the brain; salt poisoning in swine
93 .	Meningitis
94 .	Different forms of encephalitis caused by bacteria
95 .	Canine distemper and its complications . Toxoplasmosis
96 .	Regressive changes, inflammation and tumours of peripheral nerves
97 .	Functional disturbances and pathological changes in the thyroid gland, adrenal gland and the hypophysis and their consequences

98 .	Regressive changes and tumors of the skin
99 .	Exanthemas; dermatitis (in general); different forms of dermatitis caused by bacteria
100 .	Pox virus infections of mammals . Myxomatosis of rabbits; contagious ecthyma of sheep and goats (orf)

SAMPLE

VETERINARY PATHOPHYSIOLOGY

COURSE DATA SHEET

Name of Department:	Department of Pathophysiology and Oncology
Responsible teacher (email):	Dr . Péter Vajdovich (Vajdovich .peter@aotk .szie .hu)
Teacher(s) take part in teaching:	dr . Arany-Tóth Attila, dr . dr . Gaál Tibor, dr . Horváth András, dr . Jakus Judit, dr . Kungl Krisztina (kapcsolattartó: Kungl . krisztina@univet.hu), dr. Manczur Ferenc, dr. Máthé Akos, dr. Pápa Kinga, dr. Psáder Roland, dr. Sterczer Ágnes, dr. Tarpataki Noémi, dr . Tóth Bálint, dr . Vajdovich Péter, dr . Vörös Károly
Aim of subject:	To provide understanding and knowledge on how pathologic processes (e.g. inflammation etc.) occur and impact the whole of the organism and the specific organ systems.
Preliminary weekly schedule of lectures – for update detailed program see the schedule of lectures in a separate pdf	
1 . week	The subject of pathophysiology, notions of illness and health . Alterations of isovolaemic and isoosmotic conditions . Disturbances in water balance . Edema . Ion balance and its alterations I . (Na ⁺ , K ⁺ , Cl ⁻)
2 . week	Ion balance and its alterations II . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻) . Ion balance and its alterations III . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻) . Pathophysiology of the general adaptation syndrome and the stress .
3 . week	Thermoregulation disorders, heat stroke and fever . Disorders of haemostasis I (Thrombocytopathies) . Disorders of haemostasis II (Coagulopathies) .
4 . week	Disturbances in amino acid and protein metabolism . Disturbances in carbohydrate metabolism . Disturbances in fat metabolism .
5 . week	Pathophysiology of inflammation. Pathophysiology of apoptosis. Damages of the antioxidant system .
6 . week	Disturbances of O ₂ transport and the blood loosing anaemia . Haemolytic deficiency and non regenerative anaemia. Alterations of white blood cells.
7 . week	Adaptation of the heart and their limits, heart failure . Pathophysiology of arrhythmias . Disorders of the external breathing I . (ventilation and perfusion), hypoxaemia .
8 . week	Disorders of the external breathing II . Disturbances of forestomach motility . Ruminal bloat . Abomasal dysfunctions .
9 . week	Disturbances of the ruminal carbohydrate, nitrogen and lipid metabolism . Abnormal food consuming, chewing and swallowing . Disturbances of intestinal digestion, maldigestion, malabsorption and diarrhoea .
10 . week	Intestinal motility disorders, constipation, ileus, increased peristalsis . Disturbances of the monogastric stomach, vomiting . Disturbance of liver functions, jaundice .

11 . week	Deterioration of detoxification capacity of the liver, liver insufficiency of vascular origin, ascites . Altered protein, carbohydrate and lipid metabolism in the liver . Renal disturbances, glomerulopathies I . (physiology, glomerulopathies) .
12 . week	Renal disturbances, tubular malfunctions II . (tubulopathies, renal failure) . Gout as renal insufficiency in birds and reptiles. Disturbances of the lower urinary tract . Osteopathies .
13 . week	Disturbances of brain functions. Pathophysiological bases of the reflex abnormalities. Disturbances of spinal cord functions .
14 . week	Malfunction of the synapses . Pathophysiology of allergy, pruritus and the skin disorders . Muscular dysfunctions .
15 . week	Pathoendocrinology I . (diabetes mellitus, insipidus, Cushing' disease) . Pathoendocrinology II . (hypo-, and hyperthyreosis, rare endokrinopathies) . Disorders of internal breathing: tissue hypoxia . Shock – this lecture will be scheduled if requested .
Recommended literature	
Obligatory:	Lecture notes available from the official website of the department in pdf. Robinson, W .,F ., Huxtable, C .R .R . (2003): Clinicopathological principles for veterinary medicine . Cambridge University Press, Cambridge .

Recommended:	McGavin, Zachary, Pathologic basis of Veterinary Disease IV . ed . (2007, Moosby)
Type and method of exam	
Prerequisite: presence on the lectures according the general regulations (max . 30% absences) and successful midterm (min . result 2) . MIDTERM: during the semester one written midterm is held – one essay question min . 150 words Type of exam: written Method of exam: the exam consists of two parts: 50-60 test questions and 1 essay question	
Grading scheme	
excellent: 86-100%; good: 76-85%; satisfactory: 66-75%; passing: 51-65% failure: 0-50%	
Note(s)	
Laboratory Diagnostics and Veterinary Pathophysiology are closely related to each other . The lecture programme is arranged to match the themes of the practicals from LabD . Attending the lectures helps a lot to prepare for the practicals and learning for practicals makes Pathophys . exam much easier!	

VETERINARY PATHOPHYSIOLOGY LECTURES,

Topic	Hours
The subject of pathophysiology, notions of illness and health Alterations of isovolaemic and isoosmotic conditions	1
Disturbances in water balance . Edema	1

Ion balance and its alterations I . (Na+, K+, Cl-)	1
Ion balance and its alterations II . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻)	1
Ion balance and its alterations III . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻)	1
Pathophysiology of the general adaptation syndrome and the stress	1
Thermoregulation disorders, heat stroke and fever	1
Disorders of haemostasis I (Thrombocytopathies)	1
Disorders of haemostasis II (Coagulopathies)	1
Disturbances in amino acid and protein metabolism	1
Disturbances in carbohydrate metabolism	1
Disturbances in fat metabolism	1
Disturbances of O ₂ transport and the blood loosing anaemia	1
Haemolytic deficiency and non regenerative anaemia	1
Pathophysiology of inflammation	1
Damages of the antioxidant system	1
Alterations of white blood cells	1
Adaptation of the heart and their limits, heart failure	1
Pathophysiology of arrhythmias	1
Disturbances of forestomach motility	1
Ruminal bloat . Abomasal dysfunctions	1
Disturbances of the ruminal carbohydrate, nitrogen and lipid metabolism	1
Abnormal food prehension, chewing and swallowing	1
Disturbances of intestinal digestion, maldigestion, malabsorption and diarrhoea	1
Intestinal motility disorders, constipation, ileus, increased peristalsis	1
Disturbances of the monogastric stomach, vomiting	1
Muscular dysfunctions	1
Pathoendocrinology I . (diabetes mellitus, insipidus, Cushing' disease)	1
Pathoendocrinology II . (hypo-, and hyperthyreosis, rare endokrinopathies)	1
Disturbance of liver functions, jaundice	1
Hepatopathies of vascular origin, ascites	1
Altered protein, carbohydrate and lipid metabolism in the liver	1
Disorders of the external breathing I . (ventilation and perfusion), hypoxaemia	1
Disorders of the external breathing II .	1
Renal disturbances, glomerulopathies I . (physiology, glomerulopathies)	1

Renal disturbances, tubular malfunctions II . (tubulopathies, renal failure)		1
Renal insuff. of birds and raptiles: gout, disturbances of the lower urinary tract		1
Osteopathies		1
Disturbances of brain functions		1
Pathophysiological bases of the reflex abnormalities		1
Disturbances of spinal cord functions		1
Malfunction of the synapses .		1
Pathophysiology of allergy, pruritus and the skin disorders		1
Pathophysiology of apoptosis	Written material available	1
Disorders of internal breathing: tissue hypoxia	Written material available	1

*Dr. Péter
Vajdovich Head of the
Department*

SAMPLE

VETERINARY PHARMACOLOGY

TOPICS OF PHARMACOLOGICAL LECTURES Academic year 2017/2018, 1st Semester

Time of Lectures: Wednesday 14¹⁵ - 15⁰⁰ Thursday 8¹⁵ - 10⁰⁰

Topics of lectures		
13 September Lecture 1	Introduction to the subject, requirements . The place and role of pharmacology in veterinary education. Definition of drug.	dr. Gálfi Péter
14 September Lectures 2-3	GENERAL PHARMACOLOGY Pharmacodynamics: Structure-dependent and independent drug actions Drug-receptor interactions	dr. Gálfi Péter
20 September Lecture 4	Dose-response relationship, therapeutic concepts	dr . Csikó György
21 September Lectures 5-6	Drug toxicity, factors influencing drug toxicity Pharmacokinetics: Transport mechanisms of drugs, absorption, distribution	dr . Csikó György
27 September Lecture 7	Drug metabolism and excretion	dr . Csikó György
28 September Lectures 8-9	Pharmacokinetic modelling Principles of pharmacotherapy	dr . Csikó György
4 October Lecture 10	DETAILED PHARMACOLOGY Drugs acting on the nervous system: Pharmacology of the autonomic nervous system: Pharmacology of the parasympathetic nervous system (parasympathomimetics)	dr . Gere Erzsébet
5 October Lectures 11-12	Pharmacology of the parasympathetic nervous system (parasympatholytics) Pharmacology of the sympathetic nervous system (sympathomimetics, sympatholytics)	dr . Gere Erzsébet
11 October Lecture 13	Drugs acting on central nervous system (CNS): The inhibitory drugs of CNS: Tranquilizer sedatives	dr . Csikó György
12 October Lectures 14-15	Hypnosedatives CNS stimulants Anticonvulsive drugs	dr . Csikó György
18 October Lecture 16	Pharmacology of pain: Drug classes and categories: Opioid receptor agonists	dr . Csikó György
19 October Lectures 17-18	Opioid antagonists Neuroleptanalgesia Local anesthetics	dr . Csikó György
25 October Lecture 19	General anesthetics: Injectable anesthetics	dr. Jerzsele Ákos
26 October Lectures 20-21	Inhalational anesthetics Central and peripheral myorelaxant drugs	dr. Jerzsele Ákos

1 November Lecture 22	Pharmacology of inflammation: The chemical mediators of inflammation (the potential targets of medical treatment) . Pharmacology of immunosuppression <i>NATIONAL HOLIDAY</i> (lecture time will be set after consultation with Students)	dr. Jerzsele Ákos
2 November Lectures 23-24	Traditional NSAIDs, selective COX-2 inhibitors Cytokine-inhibitors, thromboxane antagonists, leukotriene inhibitors Antihistamines	dr. Jerzsele Ákos
8 November Lecture 25	Pharmacology of glucocorticoids	dr. Jerzsele Ákos
9 November Lectures 26-27	Pharmacology of the respiratory system: Bronchodilators, anti-inflammatory drugs, antitussive drugs, mucolytics and expectorants Pharmacology of asthma and RAO	dr . Gere Erzsébet dr. Gálfi Péter
15 November Lecture 28	Pharmacology of the cardiovascular system Pharmacology of arrhythmias	dr. Jerzsele Ákos dr. Gálfi Péter
16 November Lectures 29-30	Pharmacology of cardiac contractility (positive inotropes, cardiotoxic drugs) Pharmacology of volume regulation Pharmacology of vascular tone	dr. Jerzsele Ákos dr. Gálfi Péter
22 November Lecture 31	Diuretics	dr. Jerzsele Ákos dr. Gálfi Péter
23 November Lectures 32-33	Pharmacology of haemostasis and thrombosis Pharmacology of haematopoiesis and immunomodulation Pharmacology of the digestive system: Emetic and antiemetic drugs . Prokinetic agents	dr. Jerzsele Ákos dr. Gálfi Péter
29 November Lecture 33	Drugs for gastric and duodenal ulcers . Laxative drugs, antidiarrhoeal drugs	dr. Jerzsele Ákos dr. Gálfi Péter
30 November Lectures 34-35	Hepatoprotective drugs Drugs for the treatment of EPI (Exocrine pancreatic insufficiency) Drugs affecting gastrointestinal function in ruminants	dr. Jerzsele Ákos dr. Gálfi Péter
6 December Lecture 36	Nutritional pharmacology	dr. Jerzsele Ákos dr. Gálfi Péter
7 December Lectures 37-38	Pharmacology of the endocrine system: Pharmacology of the hypophyseal and pituitary gland hormones and analogues Pharmacology of the thyroid gland and adrenal gland hormones	dr . Csikó György
13 December Lecture 39	Pancreatic hormones, drugs influencing blood glucose level	dr . Csikó György
14 December Lectures 40-41	Pharmacology of the gonadal hormones Drugs affecting uterine function	dr . Csikó György

Budapest, 24th of August, 2017 .

Prof. Dr. Péter Gálfi
Head of Department

**TRAINING PROGRAM OF VETERINARY PHARMACOLOGY
PRACTICALS IN 2017/2018**

Topics of practicals	
Sept .11-15 . Practical 1 .	Sources of medicines used in veterinary practice, classifications & categories of drugs Work safety debriefing
Sept . 18-22 . Practical 2 .	Drug distribution and selling Proper handling, storage and dispensing of veterinary drugs, pharmacies
Sept . 25-29 . Practical 3 .	Drug names Pharmacopoeias & Formularies
Oct . 2-6 . Practical 4 .	Forms of prescriptions Legal aspects of prescription of drugs
Oct . 9-13 . Practical 5 .	Solid dosage forms I . (powders, granules, premixes)
Oct . 16-20 . Practical 6 .	Solid dosage forms II . (tablets, pills, capsules, boluses, etc .)
Oct . 24-27 . Practical 7 .	“Semisolid” dosage forms (ointments, creams, pastes, liniments etc .) CLINICAL 1: Veterinary clinical usage of tranquilizers
Oct . 30 - Nov . 3 . Practical 8 .	(no practicals during this week) Test writing 1 . (Nov . 2, 7 .00 a .m .)
Nov . 6-10 . Practical 9 .	Liquid dosage forms, aerosols (solutions, mixtures, emulsions, injections, etc .) Basic knowledge of drug preparation and dispensation
Nov . 13-17 . Practical 10 .	Research and development of veterinary preparations CLINICAL 2: Veterinary clinical usage of sedato-hypnotics
Nov . 20-24 . Practical 11 .	Registration of veterinary drugs CLINICAL 3: Veterinary clinical usage of anaesthetics
Nov . 27- Dec . 1 . Practical 12 .	CLINICAL 4: Veterinary clinical usage of opioids, NSAIDs, glucocorticoids and antihistamines
Dec . 4-8 . Practical 13 .	+ Test writing 2 . (Nov . 22, 7 .00 a .m .) CLINICAL 5: Veterinary clinical usage of drugs acting on the GI tract Veterinary clinical usage of minerals and vitamins
Dec . 11-15 . Practical 14 .	CLINICAL 6: Veterinary clinical usage of drugs acting on respiratory system General evaluation of practical knowledge Consultation, discussion

Budapest, 22 . 08 . 2017 .

Dr. Péter Gálfi
Head of the Department

**TOPICS OF PHARMACOLOGICAL LECTURES
Academic year 2017/2018, 2nd Semester**

Time of Lectures: Monday 12 .15-14 .00

Topics of lectures		
05 February Lectures 1-2	Introduction to chemotherapy	dr. Gálfi Péter dr. Jerzsele Ákos
12 February Lect . 3-4	Disinfectants and antiseptics	dr. Gálfi Péter dr . Gere Erzsébet
19 February Lectures 5-6	Beta-lactam antibiotics	dr. Jerzsele Ákos
26 February Lectures 7-8	Aminoglycoside antibiotics	dr. Jerzsele Ákos
05 March Lectures 9-10	Tetracyclines Macrolides	dr. Jerzsele Ákos
12 March Lectures 11-12	Lincosamides, pleuromutilins Phenicol	dr. Jerzsele Ákos
19 March Lectures 13-14	Polypeptides, rifamycins, glycopeptides Sulphonamides and diaminopyrimidines	dr . Csikó György
26 March Lectures 15-16	HOLIDAY ISSUED BY THE RECTOR	
7 April (Sat .) Lectures 17-18	Quinolones and other antibacterial agents	dr . Csikó György
9 April Lectures 19-20	Endoparasiticides I . Anticoccidials and other antiprotozoal drugs	dr . Csikó György
16 April Lectures 21-22	Endoparasiticides II . Anthelmintic agents (Antinematodal, antitrepatodal and anticestodal drugs)	dr . Csikó György
21 April (Sat .) Lectures 23-24	Ectoparasiticides - Agents for external parasite control	dr . Csikó György
23 April Lectures 25-26	Antifungal drugs	dr. Gálfi Péter dr . Gere Erzsébet
7 May Lectures 27-28	Antineoplastic and antiviral agents	dr. Gálfi Péter dr . Gere Erzsébet
14 May Lectures 28-29	Essential pharmacotherapeutics	dr . Csikó György

Budapest, 24th of January, 2018 .

Prof. Dr. Péter Gálfi
Head of Department

LABORATORY TOPICS OF VETERINARY PHARMACOLOGY
2017/2018 academic year, 2nd semester

Topics of practicals	
Week 1 05-09 Febr .	Application routes of drugs Veterinary clinical usage of drugs acting on cardiovascular and urinary system

Week 2 12-16 Febr .	Drug administration in laboratory animals Posology, Posological calculations Veterinary clinical usage of hormones
Week 3 19–23 Febr .	Pharmacokinetic experiments I . Animal study phase
Week 4 26 Feb .–02 Mar .	Pharmacokinetic experiments II . Evaluation of raw data by computer analysis, Veterinary clinical usage of penicillins and cephalosporins
Week 5 05-09 Mar .	In vitro study of demethylation activity in rat liver submitochondrial (S9) fraction
Week 6 12-16 . Mar .*	Experiments on drugs affecting on the central nervous system I; (Detomidine, Xylazine) observation of their analgesic effect Veterinary clinical usage of aminoglycosides and polymixin antibiotics
Week 7 19-23 Mar .	Experiments on drugs affecting on the central nervous system II; examination of the effect of injectable anaesthetics and their combinations Veterinary clinical usage of tetracyclines, macrolides, lincosamides and amphenicols
Week 8 26-30 Mar .	HOLIDAY ISSUED BY THE RECTOR *We will hold practical lessons at other time instead of 15th and 16th of March, after consultation with students .
Week 9 02*-06 Apr .	Effects of Local Anaesthetics, Atropine and Pilocarpine as eye drops Veterinary clinical usage of sulphonamides, nitroimidazoles, nitrofurans *We will hold practical lessons at other time instead of 2nd of April, after consultation with students.
Week 10 9-13 Apr .	Models for studying the tissue irritation effect of injectable drug preparations, Veterinary clinical usage of fluoroquinolones
Week 11 16-20 . Apr .	Disinfection, sterilisation in veterinary practice, Veterinary clinical usage of disinfectants & antiseptics
Week 12 23-27 . Apr .	Aspects of the usage of antimicrobial agents Veterinary clinical usage of antifungal drugs
Week 13 30* May-04 Apr .	Aspects of the usage of antiprotozoals and anticoccidials Veterinary clinical usage of antiprotozoal drugs *We will hold practical lessons at other time instead of 30th of April, after consultation with students.
Week 14 07-11 . May	Aspects of the usage of antiparasitic agents I . Veterinary clinical usage of endoparasiticides
Week 15 14-18 May	Aspects of the usage of antiparasitic agents II . Veterinary clinical usage of ectoparasiticides

Budapest, 22nd of January 2018

*Prof. Dr. Péter
Gálfi Head of the
Department*

SURGERY 1.

LECTURE COURSE OF SURGERY

**English-speaking Class, 3rd Year – 2nd Semester 2017 / 2018 (on
Wednesdays: 12 .15 – 14 .00)**

Feb 7	Principles of radiology	Dr . Arany-Tóth
Feb 14	Radiographic examination of bones and joints in small animals .	Dr . Arany-Tóth
Feb 21	Radiographic examination of the spine and the skull in small animals	Dr . Arany-Tóth
Feb 28	Radiographic examination of the abdomen in small animals	Dr . Arany-Tóth
Mar 7	Radiographic examination of the thorax in small animals . (1 h)	Dr . Arany-Tóth
	Radiographic examination of the horse I . (1 h)	Dr . Tóth
Mar 14	Radiographic examination of the horse II .	Dr . Tóth
Mar 21	Preanesthetic examination . Pharmacology of anesthetics	Dr . Dunay
Apr 4	Syringe pumps, anesthetic machines . Perioperative monitoring in small animals Perioperative analgesia in small animals	Dr . Dunay
Apr 11	Anesthesia protocols in small animals (dog, cat)	Dr . Dunay
Apr 18	Anesthesia of risk patients and emergency in small animals	Dr . Dunay
Apr 25	Perioperative analgesia in large animals Local anesthesia . Perioperative monitoring in large animals	Dr . Makra
May 2	Anesthesia protocols in large animals (horse, cattle, swine)	Dr . Makra
May 9	Anesthesia of risk patients and emergency in large animals	Dr . Makra
May 16	Supplementary diagnostic aids in equine surgery	Dr . Bodó

**PRACTICAL TRAINING COURSE OF SURGERY
in the main campus "István street"**

**English-speaking Class, 3rd Year – 2nd Semester 2017 / 2018 (on
Thursdays)***

Feb 8 Feb 15	Principles of radiographic techniques	Dr . Arany-Tóth
Febr 22 March 1	Radiation safety . Positioning in small animal radiography	Dr . Molnár Péter
March 8 March 22	Contrast procedures in small animal radiology	Dr . Arany-Tóth
Apr 12 Apr 19	Interpretation of radiographs	Dr . Arany-Tóth
Apr 26 May 3	Practical small animal anaesthesiology I	Dr . Dunay
May 10 May 17	Practical small animal anaesthesiology II	Dr . Dunay

Schedule:

* First dates belong to Group 5, 6, 7 and 8, second dates mean Group 1, 2, 3 and 4, according to the following daily timetable:

8 .15 – 11 .00: Group 3 or 7
11 .15 – 14 .00: Group 4 or 8
14 .15 - 17 .00: Group 1 or 5
17 .15 – 20 .00: Group 2 or 6

SAMPLE

VETERINARY BACTERIOLOGY

(2017-2018 1st Semester)

Denomination	Veterinary bacteriology
Department	Department of Microbiology and Infectious Diseases
Nature	mandatory
Specialization	veterinary
Scheduled place	3rd year 1st semester
Lecture	45 lessons/semester
Practical	30 lessons/semester
Credits	4
Practical grade	No
Method of evaluation	examination
Evaluation	<ul style="list-style-type: none"> • Lectures serve as the basis of the subject, active participation at the lectures is precondition of a successful examination . • Attending the practicals is compulsory, absence – including justified ones – should be retaken . Retake can happen on the same week by joining another group or attending the extra practical on the last week of the semester . Students can absolve the practical with another group if there are free seats available . • Preparation to the practicals is controlled in the form of written or oral tests . Students without knowing the theoretical subject of the practical are regarded absent . • Students can sit to the examination after attending all practicals and if they showed at least satisfactory level of knowledge (60%) during the semester .
Description, acquired knowledge	<p>The subject Veterinary bacteriology includes knowledge of bacteriology relevant in veterinary medicine together with certain chapters of mycology . In the framework of the subject bacteriology the students learn general bacteriology, specific bacteriology and mycology with a special focus on pathogens of veterinary importance . In the practicals students have to acquire simple bacteriological laboratory techniques and identification procedures. Characteristics of the most important pathogenic bacteria are studied as well . Teaching is organised in the form of lectures and small group laboratory practicals .</p>
Competences	<p>After absolving the subject the students will be able to</p> <ul style="list-style-type: none"> • recognise the most bacteria and fungi of veterinary and human importance, • carry out laboratory examinations in order to identify them, • understand the role of bacteria and fungi in life, in pathology, physiology, nutrition and ecology, • implement disinfection and sterilisation methods, • understand the principles of antibacterial treatment, • understand the pathological consequences of genetic changes of bacteria .

Rules of the practicals	<ul style="list-style-type: none"> • Wearing white coat is compulsory . Overcoats and bags have to be left in the changing room. • Eating, drinking and smoking at the practicals is forbidden . • Accidents at the practicals have to be reported to the teacher at the practicals .
Teaching environment	<p>Computer aided lectures are given in the Magyary-Kossa lecture theatre of the campus . The practicals are held at the 16-head-practical room of the department, where individual microscopes, computerised summaries help the understanding . The basic laboratory examinations can be carried out by the students themselves and the complicated methods are demonstrated here as well . The demonstration material is prepared in the bacteriology laboratory of the department .</p>
Teaching staff	<p>Fodor, L . and Makrai, L . (lectures), Makrai, L . and Tóth, G . (practicals)</p>
Recommended literature	<ul style="list-style-type: none"> • Madigan, M.T ., Martinko, J.M ., Stahl, D.A ., Clark, D.P .: Brock Biology of Microorganisms 13th ed . Pearson Education, SanFrancisco, CA, USA, 2012 . • Markey, B ., Leonard, F ., Archambault, M ., Cullinane, A ., Maguire, D .: Clinical Veterinary Microbiology . Mosby . 2013 . • McVey, D . S ., M . Kennedy, M .M . Chengappa (Eds .): Veterinary Microbiology . Wiley-Blackwell . 2013 • Quinn, P.J ., Markey, B . Leonard, F.C ., Hartigan, P ., Fanning, S ., Fitzpatrick, E.S .: Veterinary Microbiology and Microbial Disease . 2nd Ed . Blackwell . Oxford 2011 • Selbitz, H-J ., Truyen, U ., Valentin-Weigand, P .: Tiermedizinische Mikrobiologie, Infektions- und Seuchenlehre . Georg Thieme Verlag . 2013 • Downloadable documents (password is available on NEPTUN): Power point presentations from the previous academic year are uploaded in order to support students in making own notes . At the end of the semester power point documents of the actual year will be uploaded .
Exam information	<ul style="list-style-type: none"> • Students can sit to an examination both after the autumn and spring semesters . • Students can sign to the exams through the NEPTUN system . • The maximum number of examinees is 14 per day including the English and the Hungarian class . • The examination starts at 8 .00 o'clock, the last report is at 9 .00 o'clock . • The students receive 2 questions, one each on general and specific bacteriology . • The final note is defined by the oral exam (66%) and the achievements during the practicals (33%) . • The examination is successful if at least satisfactory level of knowledge (Note 2) is shown in the case of each question . • Evaluation of the exam: excellent (90-100%), good (80-89%), satisfactory (70-79%), pass (60-69%), fail (<60%) . • If a student has to go to the toilet during the exam, she/he will receive additional questions . • Using illegal tools at the exam results disciplinary action and the exam is concluded with a 'fail' mark . • If more information is needed, please ask Assoc . Prof . László Makrai (makrai .laszlo@univet .hu) .

Date	Topics of the lectures
11 .09 .	Media, sterilization of media and utensils, bacterial cultures, anaerobic culture methods, pure cultures,
14 .09 .	Microscopy, examination of native bacteria .
18 .09 .	Staining of bacteria, Bacillus anthracis and aerobic spore-forming bacteria . Clostridium .
21 .09 .	Subject of microbiology, its aim and short history .
25 .09 .	Staphylococcus, Micrococcus, Streptococcus, Enterococcus, Lactococcus, Anaerobic cocci, Lactobacillus .
28 .09 .	Characterization of bacteria, their importance in life . Size and shape of bacteria .
02 .10 .	Erysipelothrix, Listeria, Corynebacterium, Rhodococcus, Renibacterium .
05 .10 .	Structure of the bacterial cell .
09 .10 .	Mycobacterium, Nocardia, Actinomyces, Trueperella, Actinobaculum, Dermatophilus, Streptomyces .
12 .10 .	Structure of the bacterial cell .
16 .10 .	General characterisation of Enterobacteriaceae . Escherichia, Klebsiella, Enterobacter .
19 .10 .	Metabolism of bacteria, autotrophic and heterotrophic bacteria . Carbohydrate metabolism of bacteria .
26 .10 .	Nitrogen metabolism of bacteria . Lipid metabolism, vitamin and additive demand, pigment production .
30 .10 .	Salmonella, Citrobacter, Shigella, Proteus, Providentia, Yersinia, Serratia, Edwardsiella, anaerobic Gram-negative rods .
02 .11 .	Detection of some metabolites and enzymes .
06 .11 .	Pasteurella, Mannheimia, Bibersteinia, Ornithobacterium, Riemerella, Actinobacillus, Haemophilus, Histophilus, Avibacterium, Taylorella. Identification of an unknown bacterium I .
09 .11 .	Growth and multiplication of bacteria. Environmental effects on multiplication.
13 .11 .	Brucella, Pseudomonas, Burkholderia, Aeromonas, Francisella, Bordetella, Moraxella . Identification of an unknown bacterium II.
16 .11 .	Resistance of bacteria against physical effects. Sterilisation.
20 .11 .	Vibrio, Campylobacter, Lawsonia, Helicobacter, Arcobacter, Spirochaetes . Bacteriological examination of pathological samples I .
23 .11 .	Disinfection .
27 .11 .	Mycoplasma, Rickettsia, Chlamydia . Bacteriological examination of pathological samples II .

30 .11 .	Antibacterials .
04 .12 .	Fungi .
07 .12 .	Genetics of bacteria .
11 .12 .	Genetics of bacteria .
14 .12 .	Pathogenicity and infection .

Date		Topics of practicals
1 .	18 .09-22 .09 .	Media, sterilization, bacterial cultures, anaerobic culture methods, pure cultures, microscopy .
2 .	25 .09-29 .09 .	Bacillus anthracis and aerobic spore-forming bacteria . Clostridium .
3 .	02 .10-06 .10 .	Staphylococcus, Micrococcus, Streptococcus, Enterococcus, Lactococcus, Anaerobic cocci, Lactobacillus .
4 .	09 .10-13 .10 .	Erysipelothrix, Listeria, Corynebacterium, Rhodococcus, Renibacterium .
5 .	16 .10-20 .10 .	Mycobacterium, Nocardia, Actinomyces, Trueperella, Actinobaculum, Dermatophilus, Streptomyces .
6 .	23 .10-27 .10 .	General characterisation of Enterobacteriaceae . Escherichia, Klebsiella, Enterobacter .
	30 .10-03 .11 .	No practicals
7 .	06 .11-10 .11 .	Salmonella, Citrobacter, Shigella, Proteus, Providentia, Yersinia, Serratia, Edwardsiella, anaerobic Gram-negative rods .
8 .	13 .11-17 .11 .	Pasteurella, Mannheimia, Bibersteinia, Ornithobacterium, Riemerella, Actinobacillus, Haemophilus, Histophilus, Avibacterium, Taylorella. Identification of an unknown bacterium I.
9 .	20 .11-24 .11 .	Brucella, Pseudomonas, Burkholderia, Aeromonas, Francisella, Bordetella, Moraxella. Identification of an unknown bacterium II.
10 .	27 .11-01 .12 .	Vibrio, Campylobacter, Lawsonia, Helicobacter, Arcobacter, Spirochaetes . Bacteriological examination of pathological samples I .
11 .	04 .12-08 .12 .	Mycoplasma, Rickettsia, Chlamydia . Bacteriological examination of pathological samples II .
12 .	11 .12-15 .12 .	Fungi .
13 .	11 .12-15 .12 .	Retake .

1st September, 2017

Questions at the examination 2017/2018

Veterinary bacteriology

1 .	Position and significance of bacteria in the biosphere. Eukaryotes and prokaryotes.
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2.	The size and shape of bacteria, their examination by light, dark-field, phase contrast, fluorescence and electron microscope.
3.	The structure of bacterial cell, cell wall, cytoplasm, cytoplasmic membrane, nuclear material .
4.	Capsule, flagella, fimbria and spore of bacteria.
5.	Examination of native and stained bacteria. Simple and differential staining methods.
6.	Bacterial metabolism . Autotrophic and heterotrophic bacteria . Vitamin and additive requirements of bacteria . Bacterial pigments .

7.	Utilization of bacterial activity .
8.	Nitrogen metabolism of bacteria . Detection of the most important enzymes and metabolites of the nitrogen metabolism .
9.	Carbohydrate metabolism of heterotrophic bacteria, aerobic and anaerobic bacteria . Detection of enzymes and metabolites of the carbohydrate metabolism .
10.	Culture of bacteria, media, pure cultures . Anaerobic cultures .
11.	Growth and multiplication of bacteria . Growth phases in cultures, methods of counting bacterial cells .
12.	Environmental effects on the growth of bacteria (water, temperature, pH, osmosis).
13.	The resistance of bacteria against physical effects.
14.	Disinfection and disinfectants .
15.	Sterilization methods .
16.	The concept and the aim of antibacterial therapy . Types of bacterial resistance to antibacterials . Examination of antibiotic resistance of bacteria .
17.	Antibacterials acting on the cell wall, the cytoplasmic membrane and the genome of bacteria .
18.	Antibacterials acting on the protein synthesis of bacteria .
19.	Sulphonamides, nitrofurantoin .
20.	Structure and function of bacterial genetic material .
21.	Mutations .
22.	Extra chromosomal genetic elements of bacteria, the most important plasmids .
23.	Recombination of bacterial genetic material, bacterial transformation, transduction, phage conversion .
24.	Bacterial conjugation. Phenotypic modification of bacteria.
25.	Examination of the genetic material of the bacteria . Gene manipulations, genetic engineering in bacteria .

26 .	Pathogenic and saprophytic microorganisms . Pathogenicity and virulence . Measurement and changing of virulence .
27 .	Factors of virulence attached to the bacterial cell wall, extra cellular enzymes .
28 .	Toxins of bacteria . Exotoxins and endotoxins .
29 .	Identification of bacteria.
30 .	Bacillus anthracis and the aerobic spore forming bacteria .
31 .	Clostridium .
32 .	Staphylococcus, Micrococcus .
33 .	Streptococcus, Enterococcus, Lactococcus, anaerobic cocci, Lactobacillus .
34 .	Erysipelothrix, Renibacterium, Rhodococcus .
35 .	Listeria, Nocardia, Dermatophilus .
36 .	Mycobacterium (occurrence, morphology, staining, culture, facultative pathogenic, saprophytic mycobacteria)
37 .	Mycobacterium (antigens, resistance, obligate pathogenic mycobacteria)
38 .	Corynebacterium, Actinomyces, Trueperella, Actinobaculum .
39 .	The general characteristics of Enterobacteriaceae . Klebsiella, Enterobacter .
40 .	Gram-negative anaerobic rods .
41 .	Escherichia coli .
42 .	Salmonella, Citrobacter .
43 .	Shigella, Yersinia, Proteus, Providentia, Serratia, Edwardsiella .
44 .	Pasteurella, Mannheimia, Bibersteinia, Ornithobacterium .
45 .	Haemophilus, Histophilus, Avibacterium .
46 .	Actinobacillus, Taylorella, Riemerella .
47 .	Francisella, Bordetella, Moraxella .
48 .	Brucella .
49 .	Pseudomonas, Burkholderia, Aeromonas .
50 .	Vibrio, Lawsonia, Helicobacter, Arcobacter .
51 .	Campylobacter .
52 .	The general characteristics of Spirochaetes . Borrelia, Treponema, Brachyspira .
53 .	Leptospira .
54 .	Rickettsiae .
55 .	Chlamydia .
56 .	Mycoplasma .

57.	Characterisation of fungi, their morphology, culture, replication, resistance, groups .
58.	Pathogenic role of fungi, dermatophytes .
59.	Penicillium, Aspergillus, Fusarium, Stachybotrys .
60.	Imperfect yeasts and dimorphic fungi (genera, species) .

1st September, 2017

L. Fodor

SAMPLE

VETERINARY IMMUNOLOGY

Last change: 12 .04 .2018 10:41

Course	Veterinary immunology
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	3/2
Credits	3
Lectures	45 lessons/semester
Practical lessons	15 lessons/semester
Specialization	veterinary (English)
Department	<u>Department of Microbiology and Infectious Diseases</u>

Description

Veterinary Immunology provides a summary of important knowledge for veterinarians . The subject is discussed in detail after the general introduction of the threefold structure of the immune system, focusing on the details of the elements of acquired immunity . Students will learn about immune prophylaxis, autoimmune diseases and various deficiencies or malfunctions of the immune system, knowledge that is essential in veterinary practice .

The laboratory exercises introduce the commonly used in vitro and in vivo diagnostic procedures, and also the mode of evaluation of the diagnostic results obtained through them .

Language	English
Year	3 rd
Term (semester)	6 th
Lectures	45 lectures
Practicals	15
Structure of the subject	immunology lectures, immunology practicals
Credits	3
Examination	oral or written exam at the end of the semester
Teaching staff	Rusvai M., Lőrincz M., Valkó A. (lectures and practicals)

Rules of the practicals:

- Having a white coat on is compulsory.
- Eating, drinking and smoking is forbidden.
- Accidents at the practicals must be reported to the teacher at the practicals.

Teaching environment:

The computer aided lectures are given in one of the lecture theatres of the campus . The practicals are held at the 16-head-practical room of the department, where individual microscopes, computerised summaries help

the understanding . The basic laboratory examinations can be carried out by the students themselves and the complicated methods are demonstrated here as well . The demonstration material is prepared in the Immunology laboratory of the department .

Recommended literature:

- Ian Tizzard: Veterinary Immunology: An introduction . 8th Edition, Elsevier, 2010 .
- Janeway Jr ., C . A ., P . Travers, M . Walport, and M . J . Shlomchik . 2001 . Immunobiology: the immune system in health and disease . Garland Publishing, New York, NY .

Subject of lectures in detail			
	Date	Lecturer	Topic
1 .	07/02	M . Lorincz	Introduction to veterinary immunology
2 .	07/02	M . Lorincz	Organs of the immune system
3 .	09/02	M . Lorincz	Cells of the immune system
4 .	14/02	M . Lorincz	Antigens: endo- exoantigens, structures of the epitopes, PAMP and DAMP
5 .	14/02	M . Lorincz	PRR: secreted, membrane-bound and intracellular receptors
6 .	16/02	M . Lorincz	Innate immunity: cells, phagocytosis
7 .	21/02	M . Lorincz	Innate immunity: antigen presentation in the MHC and CD1
8 .	21/02	M . Lorincz	Innate immunity: complement system
9 .	23/02	M . Lorincz	Innate immunity: cytokines
10 .	28/02	M . Rusvai	Adaptive immunity: BCR and TCR - structures, tasks and CD3-complex
11 .	28/02	M . Rusvai	Adaptive immunity: genetic background of antibody (BCR) and TCR production
12 .	02/03	M . Rusvai	Adaptive immunity: production and application of monoclonal antibodies
13 .	07/03	M . Rusvai	Adaptive immunity: development and activation of T cells
14 .	07/03	M . Rusvai	Adaptive immunity: T-helper cells and cellular immune response
15 .	09/03	M . Rusvai	Adaptive immunity: activation of B cells, B cells as antigenpresenting cells
21 .	10/03	M . Rusvai, M . Lorincz	Consultation
16 .	14/03	M . Rusvai	Adaptive immunity: humoral immune response
17 .	14/03	M . Rusvai	Adaptive immunity: development of the immune memory
18 .	16/03		Holiday
19 .	21/03	M . Lorincz	The regulation of the immune response: Atg, Ab, idiotype - anti-idiotype network. Inflammation.

20 .	21/03	M . Lorincz	The regulation of the immune response: Treg-cells
21 .	23/03	M . Lorincz	The regulation of the immune response: regulation of the neuroendocrine system, microbiom
22 .	28/03		Spring holiday
23 .	28/03		Spring holiday
24 .	30/03		Spring holiday
25 .	04/04	M . Lorincz	The regulation of the immune response: immune-tolerance
26 .	04/04	M . Lorincz	Mucosal and skin immune response
27 .	06/04	M . Lorincz	Foetal and maternal immunity
28 .	11/04	M . Lorincz	Foetal and maternal immunity
29 .	11/04	M . Lorincz	Natural autoimmunity
30 .	13/04	M . Lorincz	General overview of immune responses
31 .	18/04	M . Lorincz	Immune response to pathogens: parasites and fungi
32 .	18/04	M . Lorincz	Immune response to pathogens: bacteria and viruses
33 .	20/04	M . Lorincz	Immune response to pathogens: tumors
34 .	25/04	M . Lorincz	Passive immunization
35 .	25/04	M . Lorincz	Active immunisation: vaccine types, vaccination methods
36 .	27/04	M . Lorincz	Active immunisation: adjuvants, immunomodulation
37 .	02/05	A . Valko	Autoimmune diseases
38 .	02/05	A . Valko	Autoimmune diseases
39 .	04/05	A . Valko	Immunodeficiency
40 .	09/05	M . Lorincz	Transplantation
41 .	09/05	M . Lorincz	Other treatments for the therapy of immunological diseases
42 .	11/05	M . Lorincz	A few aspects of the immune system evolution
43 .	16/05	A . Valko	Hypersensitivity reactions
44 .	16/05	A . Valko	Hypersensitivity reactions

45	18/05	M . Lorincz	Consultation
Subject of practicals in detail			
Date		Topic	
03 .19-03 .23 .		Immunodiagnosics, serology, agglutination	
04 .09- 04 .13 .		Precipitation, complement fixation	
04 .16-04 .20		ELISA, immunofluorescence, immunohistochemistry	
04 .23-04 .27		PAGE, Western blot, FACS, rapid diagnostic methods	
05 .07-05 .11		Cellular and in vivo tests	

VETERINARY PATHOPHYSIOLOGY

Last change: 13 .09 .2016 09:57

Course	Veterinary Pathophysiology
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	3/1
Credits	3
Lectures	45 lessons/semester
Practical lessons	0 lessons/semester
Specialization	veterinary (English) veterinary (German)
Department	Department of Clinical Pathology and Oncology

Description

Pathophysiology is a branch of sciences which deals with the pathological functioning of organism, the development/pathomechanism of pathological processes and partly with its consequences . In the field of pathology it can be taken as an integral part of pathoanatomy with the differentiating feature that pathophysiology studies pathological procedures in vivo and practically no morphological treatments are applied by its methods of examination .

SCHEDULE OF PATHOPHYSIOLOGY LECTURES 2011/2012, 1st semester

(45 lectures) year:

Lecturers: Károly Vörös, Ágnes Sterczler, Ferenc Manczur, Noémi Tarpataki, Roland Psáder, Krisztina Kungl, Kinga Pápa, Mónika Keresztes, Attila Arany-Tóth, Péter Csébi, Zsófia Koltai, Péter Vajdovich

Date	Topic	Lecturer	hours
05 .09 . Monday	The subject of pathophysiology, notions of illness and health Alterations of isovolaemic and isoosmotic conditions	Vajdovich	1
06 .09 . Tuesday	Disturbances in water balance . Edema	Vajdovich	1
06 .09 . Tuesday	Ion balance and its alterations I . (Na ⁺ , K ⁺ , Cl ⁻)	Vajdovich	1

12 .09 . Monday	Ion balance and its alterations II . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻)	Vajdovich	1
13 .09 . Tuesday	Ion balance and its alterations III . (Ca ²⁺ , Mg ²⁺ , PO ₄ ²⁻)	Vajdovich	1
13 .09 . Tuesday	Thermoregulation disorders, heat stroke and fever	Kungl	1
19 .09 . Monday	Pathophysiology of the general adaptation syndrome and the stress	Vajdovich	1
20 .09 . Tuesday	Disorders of haemostasis	Vajdovich	1

20 .09 . Tuesday	Damages of the antioxidant system	Vajdovich	1
26 .09 . Monday	Pathophysiology of inflammation	Vajdovich	1
27 .09 . Tuesday	Pathophysiology of apoptosis	Vajdovich	1
27 .09 . Tuesday	Disturbances in amino acid and protein metabolism	Kungl	1
03 .10 . Monday	Disturbances in carbohydrate metabolism	Vajdovich	1
04 .10 . Tuesday	Disturbances in fat metabolism	Vajdovich	1
04 .10 . Tuesday	Disturbances of O ₂ transport and the blood loosing anaemia	Vajdovich	1
10 .10 . Monday	Haemolytic deficiency and non regenerative anaemia	Vajdovich	1
11 .10 . Tuesday	Alterations of white blood cells	Vajdovich	1
11 .10 . Tuesday	Disorders of the external breathing I . (ventilation and perfusion), hypoxaemia	Psáder	1
17 .10 . Monday	Disorders of the external breathing II .	Psáder	1
18 .10 . Tuesday	Disorders of internal breathing: tissue hypoxia	Vajdovich	1
18 .10 . Tuesday	Abnormal food consuming, chewing and swallowing	Kungl	1
24 .10 . Monday	Ruminal bloat . Abomasal dysfunctions	Vörös	1
25 .10 . Tuesday	Disturbances of the ruminal carbohydrate, nitrogen and lipid metabolism	Keresztes	1
25 .10 . Tuesday	Disturbances of forestomach motility	Keresztes	
07 .11 . Monday	Adaptation of the heart and their limits, heart failure	Vörös	1
08 .11 . Tuesday	Pathophysiology of arrhythmias	Manczur	1
08 .11 . Tuesday	Shock	Vajdovich	1
14 .11 . Monday	Disturbances of the monogastric stomach, vomiting	Keresztes	1
15 .11 . Tuesday	Intestinal motility disorders, constipation, ileus, increased peristalsis	Pápa	
15 .11 . Tuesday	Disturbances of intestinal digestion, maldigestion, malabsorption and diarrhoea	Vajdovich	1
21 .11 . Monday	Disturbance of liver functions, jaundice	Sterczler	1

22 .11 . Tuesday	Altered protein, carbohydrate and lipid metabolism in the liver	Vajdovich	1
22 .11 . Tuesday	Deterioration of detoxification capacity of the liver, liver insufficiency of vascular origin, ascites	Sterczer	1
28 .11 . Monday	Renal disturbances, glomerulopathies I .	Manczur	1
29 .11 . Tuesday	Renal disturbances, tubular malfunctions II .	Manczur	1
29 .11 . Tuesday	Gout as renal insufficiency in birds and reptiles disturbances of the lower urinary tract	Vajdovich	1
05 .12 . Monday	Osteopathies	Arany-Tóth	1
06 .12 . Tuesday	Disturbances of brain functions	Vajdovich	1
06 .12 . Tuesday	Pathophysiological bases of the reflex abnormalities	Vajdovich	1

12 .12 . Monday	Disturbances of spinal cord functions	Csébi	1
13 .12 . Tuesday	Malfunction of the synapses .	Vajdovich	1
13 .12 . Tuesday	Pathophysiology of allergy, pruritus and the skin disorders	Tarpataki	1

4TH YEAR

SAMPLE

ANIMAL HYGIENE I.

Subject of lectures in detail		
8 th Feb .	Dr . Könyves László	Introduction of the subject „Animal Hygiene and Herd Health” . Dairy farm visit . General aspects, preparation and execution . Visual herd diagnostic (scoring) methods . Examination of the feeds and ration . Evaluation of the housing and the management .
15 th Feb .	Dr . Kovács Péter	Epidemiological aspects of establishing and operating animal production units . Bio-security measures . Animal hygienic principles of construction and reconstruction of stables . Physical properties of building materials . Demands for walls, roof, windows and floor. Canalization of stables
22 nd Feb .	Dr . Kovács Péter	Disinfection of stables and animal premises . Definitions. Factors affecting efficiency of disinfection. Physical and chemical methods of disinfection . Practical disinfection of stables, hatcheries, persons, vehicles, watering systems, water resources . Disinfection of milking operation units. Checking the efficiency of disinfection.
1 st Mar .	Dr . Kovács Péter	Environmental effects of animal farming. Sustainability of livestock production, environmental impacts of emissions . Categories, disposal and processing of animal wastes .
8 th Mar .	Dr . Pribenszky Csaba	Interactions between animal and its surrounding . Research and latest results in stress concept .
15 th Mar .	Dr . Brydl Endre	Feed hygiene I . Mycotoxins . General characteristics of mycotoxins . Classification of moulds. Field fungi. Fusarium toxins. Zearalenone. Trychothecenes . Fumonisin . Satratoxins . National Day . The lecture sketch and recommended literature will be provided.
22 nd Mar .	Dr . Könyves László	Feed hygiene II . Hygiene of the drinking water . Rules and good execution practice of collecting feed and water samples for analysis
26 th 30 th Mar .		Rectoral Holidays:
5 th Apr .	Dr . Könyves László	Feed hygiene III . Animal hygienic aspects of the chemical decomposition of feed components . The oxidative stress . Biogen amines . Preventive measures Microbial contamination of feeds. Classification of feed flora, Environmental conditions of microbial gradation . Consequences of feed spoilage and preventive measures .
12 th Apr .	Hejel Péter .	The effect of microclimatic conditions on the production and health of the farm animals . Energy metabolism of the organism . Thermal balance of animals . Heat exchange between organism and environment . Thermoregulation of the animals. Effect of environmental factors on energy metabolism of farm animals . Adaptation to climatic conditions . The effect of heat stress on the health and performance of farm animals. Quantification of heat stress.
19 th Apr .	Hejel Péter	Effects of aerial pollutions on production and health of farm animals. Gaseous contaminants of the stable air . Biological aerosols . Measurement methods of airborne pollutants .

26th Apr .	Hejel Péter	Climatization of stables . Ventilation of stables . Heat supply to stables . Measurement of the climatic surrounding . Interpretation and measurement of the physical elements of the microclimatic conditions . Technical equipments of the climatic measurements . Data processing .
3rd May	Dr . Könyves László	Management related (sin . multifactorial) diseases of farm animals . Definitions: multifactorial diseases; germ load; facultative pathogens. Defence mechanisms . Interactions between housing-management factors and germ load . Interactions between housing-management factors and the defence mechanisms . Principles of control of the management related diseases .
10th May	Dr . Brydl Endre	Feed hygiene IV . Store-house moulds. Aflatoxins, Ochratoxins, Patulin, Citrinin Mycotoxin contamination of feed commodities . Relevant regulations . Defence against mycotoxin contamination .
17th May	Hejel Péter	Precision livestock farming (PLF), as a new tool of the modern animal husbandry and herd-health management. Benefits and practical use of the automated, real time monitoring systems .

Budapest, 30th January 2018 *assoc. professor, head of the department*

SAMPLE

AVIAN AND EXOTIC ANIMALS MEDICINE

Last change: 09 .05 .2016 11:11

Course	Avian and Exotic Animals Medicine
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	4/2
Credits	2
Lectures	24 lessons/semester
Practical lessons	0 lessons/semester
Specialization	veterinary (English)
Department	Department of Exotic Animal and Wildlife Medicine

Description

Responsible teacher: Dr . János Gál

In the frame of the course the students will be informed about the biology, captive behavior and breeding of exotic animals connected with the most common diseases and symptoms . During the lessons the subject contains the basic of monitoring, introduction of diagnostical methods of the daily praxis . The most common infectious and non-infectious diseases of each animal groups will be also discussed, especially their diagnostical and therapical aspects. Subject of lectures in detail

hours	Topics
2	Introduction . Biology and keeping of exotic rodents and rabbits . Basics of clinical examination . 8 th February 2016 . Dr . Péter Pazár
2	Noninfectious diseases of exotic rodents and rabbits . 15 th February 2016 . Dr . Péter Pazár
2	Infectious diseases of exotic rodents and rabbits . 22 nd February 2016 . Dr . Péter Pazár
2	Biology, keeping of ferrets. Basics of clinical examination. 29 th February 2016 . Dr . Péter Pazár
2	Infectious diseases of reptiles . 5 th March 2016 . Dr . János Gál
2	Biology and keeping of exotic reptiles . Basics of clilical examination . 7 th March 2016 . Dr . János Gál
2	Non-infectious diseases of reptiles . 4 th April 2016 . Dr . Tamás Sátorhelyi
2	Biology and keeping of exotic birds . Basics of clinical examination . 11 th April 2016 . Dr . János Gál
2	Important non-infectious and infectious diseases of birds . 18 th April . Dr . János Gál
2	Emergency and critical care of injured protected animals . 25 th April 2016 . Dr . Endre Sós
2	Introduction to anaesthesia of exotic animals. 2 th May 2016. Dr. Anna Nógrádi
2	Introduction to surgery of exotic animals. 9 th May 2016 . Dr . Antal Papp

BEE DISEASES**4th Year Second Semester In 2017/2018****Programme of lectures in Bee Diseases**

Programme of lectures in Bee Diseases	
08 Febr	Introduction, morphology and life cycle of honey bees
15 Febr	Life of honey bees
22 Febr	Beekeeping (video)
08 March	Viral infections
22 March	Bacterial infections . American foulbrood
05 April	European foulbrood . Other bacterial infections
12 April	Infections caused by fungi (chalk-brood, stone-brood)
19 April	Nosemosis
26 April	Acaparis woodi . Varroa destructor and other mites
03 May	Predators of honey bees . Insecticide toxicity
10 May	Non-infectious disorders, the control of bee diseases
17 May	Legislation in bee diseases, consultation

Final exam: written exam during the exam period. Three exam dates will be given after consultation with the students .

Budapest, 5 February 2018

*Róbert
Farkas
curator*

FISH DISEASES

Last change: 11 .02 .2018 13:20

Course	Fish diseases
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	4/2
Credits	2
Lectures	30 lessons/semester
Practical lessons	0 lessons/semester
Specialization	veterinary (English)
Department	Department of Exotic Animal and Wildlife Medicine

Description

The aim of the training course on fish pathology is to introduce the students into the modern knowledges both in the infective fish diseases and environmentally and farming technologically influenced health condition of fishes. After a brief introduction into the anatomy and physiology of farmed fishes (mostly carp fishes and salmonids) detailed informations on infective (viral, bacterial, fungal, parasitological) and non-infective diseases and intoxications are going to be provided .

Each topic represents 2 hour lectures and 2-4 hour practicals using microscopes and equipments for the standard necropsy . The lecturer is going to hand out short summaries on the practical topics .

Literature:

Molnár, K., Szakolczay, J. (1997): Fish hygiene. Egyetemi Jegyzet. Szent István Egyetem, Állatorvostudományi Kar, Kórbonctani és Igazságügyi Állatorvostani Tanszék
 Roberts, R .J . (1983) Fish Pathology
 Kabata (1990) Tropical fish diseases
 Stoskopf (1990) Fish Medicine

Subject of lectures in detail	
1 . week	The structure of the fish. The integument. Taxonomic features. /a Practical: Fresh preparates and smears of pathologically altered tissues of fishes.
2 . week	The motion . The digestive system . Digestion . /a Practical: Fixation and Processing Samples for Histological Studies on Fish
3 . week	Gills and respiration . Blood and vascular system . /a Practical: Further diagnostical methodes (isolation of viral, bacterial and fungal pathogens) in the fish pathological praxis.
4 . week	Urinary system, excretion . Gonads and reproduction . Endocrin system . Nervous system . Sensory organs . /a Practical: Sectioning of fishes I.
5 . week	Water environment and it's characteristics. The food-chain. Fish pond and fish farm. Technical characteristics and function of the fishing establishment. /a Practical: Sectioning of fishes II.
6 . week	Fish culture technology and it's effect on fish. Spawning, rearing, harvesting, wintering, transporting . /a Practical: Sectioning of fishes III.
7 . week	On the spot examination of fish and pond. Requirements towards specimens for laboratory examination . /a Practical: Sampling of water, fish and food probes. Analysis of the probes.
8 . week	Diseases caused by viruses . SVC, VHS, IPN . /a Practical: Preventive efforts against the rapid outbreaks of epizootic viral diseases.
9 . week	Bacterial diseases . Erythrodermatitis, vibriosis . /a Practical: Preventive efforts against the rapid outbreaks of epizootic bacterial diseases . Isolation of bacteria

10 . week	Diseases caused by algae and moulds . Gill necrosis, saprolegniasis, toxicosis caused by algae . /a Practical: Preventive efforts against the rapid outbreaks of epizootic fungal diseases. Isolation of fish pathogenic fungi and moulds.
11 . week	Importance of parasitic infection . Diseases caused by protozoan parasites . White spot disease . a Practical:Collection of parasites.Preparation of different fish protozoans and helminths I .
12 . week	Diseases caused by sporozoan parasites. Coccidiosis, Swimbladder-inflammation. /a Practical: Preparation of different fish protozoans and helminths II.
13 . week	Diseases caused by metazoan parasites . Gill worms, helminths, blood-sucker parasites . /a Practical: Treatment and medication in the fish farming praxis.
14 . week	Diseases caused by environmental factors . Loss of oxygen, feeding disorders . /a Practical: Treatment and medication in the fish farming praxis.
15 . week	Toxicosis of fish. Heavy metal, insecticide and other toxicosis. /a Practical: Regulations in the EC, veterinary controll .

INTERNAL MEDICINE 3.

Subject:	Internal Medicine 3 .
Specialization:	Veterinary Science
Term of the subject:	9 .
Number of lectures/ semester practicals/semester	36/15
Credit:	8
Prerequisites:	
Name of Department:	Department and Clinic of Internal Medicine
Responsible teacher (email):	Dr . Vörös Károly (voros .karoly@aotk .szie .hu)
Teacher(s) take part in teaching:	Lectures: Kutasi Orsolya, Máthé Ákos, Abonyi Tamás, Vörös Károly, Sterczer Ágnes, Psáder Roland, Pápa Kinga, Keresztes Mónika, Manczur Ferenc, Tarpataki Noémi, Vajdovich Péter, Kómár Gyula
Aim of subject:	The goal of the subject is teaching of non-infectious diseases of the various organs and organ systems of house mammals (ruminants, horses, swine, dogs, and cats) . Etiology and pathogenesis of these diseases are discussed in details as well as diagnosis, treatment and prevention . . The subject includes both theoretical and practical education . The goal of the practical lessons of internal medicine is to practice diagnostic and therapeutic methods .
Weekly schedule of lectures	
1 . week	Urinary diseases . Acute renal failure

	Chronic renal failure . Diseases of dogs and cats I .
2 . week	Diseases of dogs and cats II .
	Diseases of dogs and cats III .
3 . week	Metabolic and locomotion diseases of dogs and cats I .
	Plenary lecture: Ultrasonography and endoscopy of horses
4 . week	Metabolic and locomotion diseases of dogs and cats II .
	Diseases of the canine and feline nervous system Congenital, disorders. Inflammatory diseases I.
5 . week	Inflammatory diseases II. Metabolic and toxic diseases I.
	Metabolic and toxic diseases II .
6 . week	Physical and neoplastic disorders

7 . week	Plenary lecture: Endoscopy of the respiratory and alimentary tract in dogs and cats .
	Epilepsy . Seizures of extracerebral origin,
8 . week	Plenary lecture: Abdominal ultrasonography of dogs and cats .
9 . week	Spinal cord diseases .
	Nincs előadás
10 . week	Plenary lecture: Echocardiography of dogs and cats .
11 . week	Endocrine diseases of dogs and cats I .
	Endocrine diseases of dogs and cats II .
12 . week	Endocrine diseases of dogs and cats III .
	Endocrine diseases of dogs and cats IV . Diseases of the skin of dogs and cats I .
13 . week	No lecture
	Diseases of the skin of dogs and cats II .
14 . week	Diseases of the skin of dogs and cats III
	Diseases of the skin of dogs and cats IV .
15 . week	No lecture
	No lecture

Recommended literature

Obligatory:	<p>Nelson, C .R ., Couto, G . (2008): Small Animal Internal Medicine . 4th ed . Mosby; St . Luis . ISBN: 978-0-323-04881-1 .</p> <p>Radostits, O.M., Gay, C.C., Hinchliff, K., Constable, P.D. (2006): Veterinary Medicine . A textbook of the diseases of cattle, horses, sheep, pigs and goats . 10th . ed ., Elsevier Publisher .</p> <p>Willemse, T .(1992): Clinical dermatology of dogs and cats . Lea and Febiger .</p> <p>Lecture notes in the folder available for students on the web site of the Department .</p>
Recommended:	
Type and method of exam: FE(= final exam)	
Note(s):	

INTERNAL MEDICINE I.

Practical Lessons, Large Animals 4th year			
date	time	group	
15 . okt	13 .00-15 .15	1, 2	<p>Methods of oral and parenteral drug application in the horse . Methods of blood sampling, intravenous catheterization, infusion, transfusion in the horse .</p> <p>Methods of oral and parenteral drug application in ruminants . Methods of blood sampling, intravenous catheterization, infusion, transfusion in ruminants .</p> <p>Tubing and trocarization of the rumen, puncture of the omasum and the abomasum .</p> <p>Abdominocentesis, thoracocentesis and pericardiocentesis in ruminants .</p> <p>Urine sampling .</p> <p>Tuberculin and mallein test .</p> <p>Therapeutic methods in the swine .</p> <p>Nasogastric tubing, gastric lavage, puncture of the cecum and the large colon, rectal enema in the horse .</p> <p>Abdominocentesis, thoracocentesis and pericardiocentesis in the horse .</p> <p>Collection of tracheal and lower airway secretions .</p>
	10 .00-12 .15	3, 4	
29 . okt	13 .00-15 .15	5, 6	
	10 .00-12 .15	7, 8	
05 . nov	13 .00-15 .15	1, 2	
	10 .00-12 .15	3, 4	
12 . nov	13 .00-15 .15	5, 6	
	10 .00-12 .15	7, 8	
19 . nov	13 .00-15 .15	1, 2	
	10 .00-12 .15	3, 4	
26 . nov	13 .00-15 .15	5, 6	
	10 .00-12 .15	7, 8	
03 . dec	11 .00-13 .15	1, 2	
	13 .45-16 .00		

	8 .15-10 .30	3, 4
	11 .00-13 .15	
10 . dec	11 .00-13 .15	5, 6
	13 .45-16 .00	
	8 .15-10 .30	7, 8
	11 .00-13 .15	

INTERNAL MEDICINE II.

Clinical Lectures of Internal medicine 2

4th year, 2016/2017, 2nd term (curriculum 60 hours, real 56 hours) A

belgyógyászati előadások tematikája

évf. 2016/2017. tanév II. félév (tanterv szerint 60 óra, ténylegesen 56 óra előadás)

Előadások a magyar nyelvű évfolyam. részére:

Hétfő: 10.15-12.00

Péntek: 10.15-12.00

Lectures for the English class

Monday: 13 .15-15 .00 Friday: 12 .15-14 .00

Téma	Topic	Lecturer Előadó	Hours Óra	Date Időpont
A sertések betegségei	Diseases of swine			xxx
Gyomorfekély, bélgyulladás, bélsárrekedés	Gastric ulcer, enteritis, impaction	Dr . Biksi I .	2	06 February, Monday/hétfő
Májbetegségek	Diseases of the liver	Dr . Biksi I .	1	10 February, Friday/péntek
Szívbetegségek, a vérképző szervek betegségei .	Cardiac and haematopoietic diseases	Dr . Biksi I .	1	
Húgyászati betegségek	Urinary diseases	Dr . Biksi I .	1	13 February, Monday/hétfő
Anyagforgalmi és mozgásszervi betegségek	Metabolic and locomotion diseases	Dr . Biksi I .	1	
Légzőszervi betegségek	Respiratory diseases	Dr . Abonyi T .	2	17 February Friday/péntek
Idegrendszeri betegségek	Diseases of the nervous system	Dr . Biksi I .	1	20 February, Monday/hétfő
Bőrbetegségek	Diseases of the skin	Dr . Biksi I .	1	
A kérődzők betegségei	Diseases of ruminants			xxx
Májbetegségek	Diseases of the liver	Dr . Szelényi Z .	1	24 February, Friday/péntek
A szájüreg betegségei	Diseases of the oral cavity	Dr . Szelényi Z .	1	Graduation Ceremony Diplomaosztó

A nyelőcső betegségei, az előgyomor-betegségek felosztása	Diseases of the oesophagus, classification of forestomach disorders	Dr . Horváth A .	2	27 February, Monday/hétfő
Bendóacidosis; bendőfelfúvódás	Rumen acidosis, ruminal bloat	Dr . Szelényi Z .	2	03 March, Friday/péntek
Recés-hashártyahártya gyulladás, Hoflund-betegség	Reticuloperitonitis Vagus indigestion	Dr . Horváth A .	2	06 March, Monday/hétfő
Az oltógyomor betegségei I . Refluxszindróma	Abomasal diseases I Abomasal reflux syndrome	Dr . Horváth A .	2	10 . March, Friday/péntek

Az oltógyomor betegségei II . Terápiás vonatkozások	Abomasal diseases II Therapeutic approaches	Dr . Horváth A .	1	13 March Monday/hétfő
A belek betegségei	Diseases of the intestines	Dr . Abonyi T .	1	
A légzőszervek betegségei	Respiratory diseases	Dr . Abonyi T .	2	17 March, Friday/péntek
Anyagforgalmi és mozgásszervi betegségek (lásd honlap) A vérbépző szervek betegségei Szívbetegségek	Metabolic and locomotion diseases, (see web site) Haematopoietic diseases Cardiac diseases	Dr . Szelényi Z .	2	20 March Monday/hétfő
Húgyszervi betegségek	Urinary diseases	Dr . Szelényi Z .	1	24 March, Friday/péntek
Bőrbetegségek	Diseases of the skin	Dr . Szelényi Z .	1	
Idegrendszeri betegségek	Diseases of the nervous system	Dr . Vörös K .	2	27 March, Monday/hétfő
A lovak betegségei	Diseases of horses			xxx
A szájüreg és a nyelőcső betegségei A kólikás betegségek általános ismeretei	Diseases of the oral cavity and oesophagus General features of colic diseases	Dr . Földvári Nagy Cs .	2	31 March, Friday/péntek
A gyomor betegségei	Gastric diseases	Dr . Bakos Z .	1	03 April, Monday/hétfő
Hurutos bélgörcs, heveny bélgulladások	Spasmodic colic, acute enteritis	Dr . Bakos Z .	1	
Bélsárrekedés	Impaction of the large intestine	Dr . Földvári Nagy Cs .	2	07 April, Friday/péntek
<i>Tavaszi szünet, nincs előadás</i>	<i>Spring holiday, no lecture</i>			<i>10 April, Monday/hétfő</i>

<i>Tavaszi szünet, nincs előadás</i>	<i>Spring holiday, no lecture</i>			<i>14 April, Friday/péntek</i>
Az ileus felosztása A bélelzáródások klinikuma	Types and clinical aspects of ileus	Dr . Bakos Z .	2	<i>17 April, Monday/hétfő helyett/instead: 22 April, Saturday, szombat</i>
Idült bélgyulladások	Chronic enteritis	Dr . FöldváriNagy Cs .	1	21 April, Friday/péntek
Májbetegségek	Diseases of the liver	Dr . FöldváriNagy Cs .	1	
Felső légúti betegségek	Upper airway diseases	Dr . Bakos Z .	2	24 April, Monday/hétfő
A légzacskó betegségei Ló- asztma (IAD, RAO)	Diseases of the guttural pouch Equine asthma (IAD, RAO)	Dr . FöldváriNagy Cs .	2	28 April, Friday/péntek
<i>Munkaszüneti nap, nincs előadás</i>	<i>Bank holiday, no lecture</i>			<i>01 May, Monday/hétfő</i>
Alsó légúti betegségek	Lower airway diseases	Dr . Bakos Z .	2	05 May, Friday/péntek
Szívbetegségek	Cardiovascular diseases	Dr . Bakos Z .	2	08 May, Monday/hétfő
A vérképző szervek betegségei	Haematopoietic diseases	Dr . Bakos Z .	1	12 May, Friday/péntek
Húgyszervi betegségek	Urinary tract diseases	Dr . Bakos Z .	1	
Endokrin és anyagforgalmi betegségek	Endocrine and metabolic diseases	Dr . FöldváriNagy Cs .	2	15 May Monday/hétfő
Idegrendszeri betegségek	Diseases of the nervous system	Dr . Bakos Z .	2	19 May, Friday/péntek
Bőrbetegségek	Diseases of the skin	Dr . Bakos Z .	2	

Megjegyzés:

Február 24. (péntek) dékáni szünet (diplomaosztó) 10:00-13:00. Az adott téma előadója egyeztet az évfolyammal .

Április 17-én (hétfő) nincs előadás, helyette: április 22. (szombat).

Az utolsó két óra (Bőrbetegségek) dátumát és időpontját a téma előadója egyezteti az évfolyammal.

Remarks:

24 February (Friday) graduation ceremony from 10 AM to 1 PM, the date & time of the lectures will be discussed with the class by the relevant teacher . 17 April (Monday) no lectures, instead: 22 April (Saturday)

The date & time of the last two lectures (Diseases of the skin) will be discussed with the class by the relevant teacher .

Budapest, 16th January, 2017

Prof. Dr. VÖRÖS, Károly

head of department/egyetemi tanár, tanszékvezető

LARGE ANIMAL INTERNAL MEDICINE

Large Animal Internal Medicine Practical Sessions

Year 4, English Class

A: groups 1-2-3-4 (A/1: groups 1 and 2; A/2: groups 3 and 4) B:
groups 5-6-7-8 (B/1: groups 5 and 6; B/2: groups 7 and 8) Starting
time: see the printed, coloured table .

	Topic	Group Date	Lecturer
Pract . No . 1	Oral and parenteral medication administration in horses . Blood collection, iv catheter placement, blood culture, arterial and venous blood gas analysis, blood transfusion . Crystalloid and colloid therapy in horses . Oral rehydration . Infectious disease control and prevention .	A: 8 Febr .	Z . Bakos Cs . Földvári-Nagy
		B: 15 Febr .	Z . Bakos J . Kojer
Pract . No . 2	Nasogastric intubation, gastric lavage, caecal trocarisation, transrectal colon puncture, rectal enema, rectal exam in horses . Sampling methods from the alimentary tract . Abdominocentesis and thoracocentesis in horses .	A: 22 Febr .	D . Béni Cs . Földvári-Nagy
		B: 1 March	J . Kojer P . Mikó
Pract . No . 3	Urine collection and urinalysis . Collection of tracheal wash and bronchoalveolar lavage samples . Muscle biopsy and its indications . Skin scraping and skin biopsy . Collection and interpretation of cerebrospinal fluid samples .	A: 8 March	P . Mikó Cs . Földvári-Nagy
		B: 22 March	Z . Bakos D . Béni
Pract . No . 4	Oral and parenteral medication administration in ruminants . Blood collection, iv catheter placement, blood culture, arterial and venous blood gas analysis, blood transfusion . Crystalloid and colloid therapy in ruminants . Oral rehydration .	A: 29 March	A . Horváth Z . Szelényi D . Buják L . Lénárt
		B: 5 April	A . Horváth Z . Szelényi D . Buják L . Lénárt
Pract . No . 5	Orogastric tubing, trocarisation of the rumen . Abdominocentesis and thoracocentesis in ruminants . Examination of the rumen fluid. Other sampling methods from the alimentary tract .	A: 26 April	A . Horváth Z . Szelényi D . Buják L . Lénárt

		B: 19 April	A . Horváth Z . Szelényi D . Buják L . Lénárt
	Making up of missed practical sessions, strictly by appointment .	A: 10 May	
		B: 3 May	

LABORATORY ANIMAL SCIENCE AND BIOETHICS

Last change: 22 .02 .2018 13:40

Course	Laboratory Animal Science and Bioethics
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	4/2
Credits	2
Lectures	15 lessons/semester
Practical lessons	8 lessons/semester
Specialization	veterinary (English)
Department	Department Animal Breeding, Nutrition and Laboratory Animal Science

Description

4th year (lectures: 1 hour/week)

Basic purpose: To give theoretical and practical knowledge about the choice of experimental model, the biology, genetics, feeding and husbandry of laboratory animals, their welfare requirements, practical handling, alternatives and ethical aspects .

Remark: The layout of this course satisfies the requirements of FELESA A level certificate **For further reading:**

- Van Zutphen, L .F .M ., Bauman, V ., Beynen, A .C .: Principles of Laboratory Animal Science . Elsevier . Amsterdam, 1993, 2000 .
- NRC: Nutrient requirements of laboratory rodents . Washington, 1986 .
- Svedsen, P . and Hau, J . (Eds .): Handbook of Laboratory Animal Sciences . CRC Press . Boca Raton, Fla ., 1994, 2004 .
- Regan, T .: The case of animal rights . Univ . California Press . Berkeley . Los Angeles, 1983

Subject of lectures in detail

Week	Date	Topic	Lecturer
1 .	02 .05 .	Chronobiology	Dr . Fekete Sándor György

2.	02 .12 .	Applied Zoology	Dr . Bersényi András
3.	02 .19 .	Microbiological standardisation	Dr . Fekete Sándor György
4.	02 .26 .	Feeding and Nutrition	Dr . Fekete Sándor György

5.	03 .05 .	Genetic standardisation	Dr . Korsós Gabriella
6.	03 .12 .	Stress	Dr . Fekete Sándor György
7.	03 .19 .	Alternatives of animal models	Dr . Fekete Sándor György
8.	04 .07 .	Welfare	Dr . Fekete Sándor György
9.	04 .09 .	Nutrigenomic	Dr . Fekete Sándor György
10.	04 .16 .	Biorythms	Dr . Fekete Sándor György
11.	04 .21 .	Epigenomic	Dr . Fekete Sándor György
12.	04 .23 .	Prevention and recognition of pain	Dr . Fekete Sándor György
13.	05 .07 .	Pathology	Dr . Fekete Sándor György
14.	05 .14 .	Bioacoustic, zoomusicology	Dr . Fekete Sándor György

Subject of practicals in detail

1.	02 .16 .	Handling, sexing	Dr . Bersényi András
	02 .16 .	Dissection	Dr . Fodor Kinga
	02 .16 .	Euthanasia	Dr . Fekete Sándor György
	02 .16 .	Sampling . Surgical techniques	Dr . Korsós Gabriella
2.	03 .09 .	Mouse Anatomy	Dr . Bersényi András
	03 .09 .	Zoology	Dr . Korsós Gabriella
	03 .09 .	Recognition and assurance of the animal welfare in experimental animal facilities	Dr . Fodor Kinga
	03 .09 .	Bioethics	Dr . Fekete Sándor György

OBSTETRICS 1.

2017 Fall

**Program of Lectures for the English Course 7th Semester:
Introduction to Physiology of Reproduction.
Reproductive Physiology, Pregnancy, Genital Malfunctions
and Udder Health Care of the Cow.
Small ruminant reproduction.**

TUESDAYS from 8:15 in the “Hetzel Henrik lecture-hall” (3x45’)

1.	12 Sept .	The introduction of the program and requirements .
		Introduction to physiology of reproduction I . Hypothalamus . Corpus pineale . Hypophysis . Ovarian structures (follicular development, ovulation, formation of corpus luteum) . Neurotransmitters, hormones, growth factors in animal reproduction (Solti, L .)
2.	19 Sept .	Introduction to physiology of reproduction III . Development and maturation of the oocyte . Fertilization . Early embryonic development . The concept and species-based characteristics of maternal recognition of pregnancy (Cseh, S .)
3.	26 Sept .	Introduction to physiology of reproduction II . Concept and comparative aspects of cyclic ovarian function in domestic mammals . Spontaneous and induced forms of ovulation . Seasonality of reproduction . Puberty . (Solti, L .)
4.	3 Oct .	Puberty . The cyclic ovarian function of the cow . Estrus . Estrus detection under farm conditions, and advanced techniques used to check and improve its efficacy. Physiology and pathology of pregnancy (embryonic and fetal development; development of fetal membranes; implantation; endocrinology of pregnancy; pregnancy detection; termination of pregnancy; embryonic mortality; abortion) (Solti, L .)
5.	10 Oct .	The ovarian function in postpartum dairy and beef cows (first ovulation / onset of cyclicality; first estrus; re-conception). Energy imbalance, and protein overfeeding, trace elements and other factors influencing the postpartum reproduction. (Solti, L.)
6.	17 Oct .	Physiology and care of calving . Neonatology (the care and non-infectious diseases of newborn calves). Injuries of the birth canal. The prolapsed uterus after calving. Placental retention . (Cseh, S .)
7.	24 Oct .	Characteristics of uterine contractility during the early puerperium . Peri/ postpartum metabolic disorders: milk fever, ketosis, and fatty liver disease . Udder oedema . (Cseh, S .)
8.	31 Oct .	Physiology, pathology and clinical aspects of uterine involution and its bacterial complications . Principles of antimicrobial and prostaglandin therapy . (Földi, J .)
9.	7 Nov .	Diseases and malfunctions of genitals (CLP; anovulatory cysts; delayed ovulation; tumors and other disorders; the contagious forms of subacute/chronic (endo) metritis; other inflammatory and non-inflammatory diseases/abnormalities of the oviduct, uterus, cervix and vagina) . (Cseh, S .)
10.	14 Nov .	Endocrine treatment procedures [estrus synchronization (gestagens, PGF2a); induction of ovarian cyclicality (gestagen+eCG, GnRH); induction of ovulation (GnRH); induction and synchronization of cyclicality / ovulation (Ov-synch=GPG) in dairy and beef cattle . Management of reproduction and infertility in (1) large-scale and (2) in smaller, family-operated dairy and beef herds (Cseh, S .)
11.	21 Nov .	Anatomy, physiology and clinical investigation of the bovine udder; antimicrobial self-defense mechanisms of the udder; mastitis pathogens; pathogenesis of mastitis; inflammatory markers in the mastitis milk. Clinical pathology of mastitis caused by various pathogens (Staphylococcus aureus, CNS, Streptococci and Gram-negative environmental pathogens; the “summer mastitis”) (Jánosi Sz .)

12.	28 Nov .	Principles in herd-level management of mastitis (Markus, G .)
13.	5 Dec .	Physiology of the oestrus cycle . Seasonality of reproduction . Induction and synchronization of the oestrus cycle . Methods for improving the ovulation rates . Management of reproduction . Pregnancy and its detection . Lambing and its supervision . (Cseh, S .)
14.	12 Dec .	Nutritional and environmental factors influencing the reproductive potential of ewes . Physiology and pathology of pregnancy . Pregnancy toxemia / ketosis (Cseh, S .)

Mid-term exam (written test):

23 November 2017 Thursday 7:00 am

1-4. gr. – TORMAY BÉLA (a new) lect. hall;

5-8 . gr . – HETZEL HENRIK lect . hall

Topics: - lectures (1-10 .)

- practicals (1-4 .)

- plenaries (1-4 .)

Re-take of the missed midterm exam^{**}: 5 December 2017 Tuesday 7:00 h

HETZEL HENRIK lect . hall

Topics - lectures (1-12 .)

- practicals (1-5 .)

- plenaries (1-5 .)

Preparation of the Diploma thesis

For those students who prepare their diploma thesis at the Department of Obstetrics and Reproduction we warmly recommend to read carefully the information material provided by the

Central Library of the Faculty

(<http://www.konyvtar.univet.hu/index.php/en/education/guide-to-thesis>)

* Students who had missed mid-terms due to justified reasons or reached an insufficient result, are required to write a re-take midterm test . In case of absence without leave from the mid-term test or in case of failing the repeated test, the student is obliged to take a written exam during the exam period (containing all materials taught in the semester, including lectures, plenaries and practicals). This exam will give the note for the student. Justification of absence from the midterm test must be transmitted personally by the student to the Secretariat of the Department .

The order of duty at the Small Animal Reproduction Clinic:

1. No more than five students have permission to participate in clinical work in examination room and/or operation room of reproduction clinic simultaneously. The order is first one first serve except the students on obligatory duty . Students have to wear a clean white cloth or any type of surgeon's cloth which haven't been used at clinic of infective patients, and at the Pathology Department .

2. In the operation room the use of operation cap, mask, and plastic foot-muff (all arranged by the students oneself) is obligatory .
- 3 . The touch, feed, drink and take for a walk of the hospitalised patients is forbidden except by the agreement

of the doctor of duty at the Reproduction Clinic . **Large animal practicals held in Üllő:**

Trainers/clinicians of the farm animal clinic Üllő ask you to bring forceps, needle-holder, scalpel and scissors with yourself to the practicals .

Budapest, September, 2017

*Prof. Sandor
Cseh, chair of
department*

SAMPLE

OBSTETRICS AND REPRODUCTION 1.**2017 Fall****Training Program of Plenary Demonstrations
for the English Course – 7th Semester**

Central campus in Budapest – HETZEL HENRIK (Obst.) auditorium			
Tuesdays - 15 .15 – 19 .00 h (4×45 min)			
Tuesdays	Group	Subject	
1 .	12 Sept .	1, 2, 3, 4	Obstetrical diagnostic examination of pregnant and parturient cows and mares: Conditions of obstetrical examinations . Examination of labor pains . Rectal and vaginal examinations . Examination of the cervix . Displacements of the gravid uterus. Methods to improve the effectivity of obstetrical aid-I. (Z . Szelényi)
	19 Sept .	5, 6, 7, 8	
2 .	26 Sept .	1, 2, 3, 4 .	Methods to improve the effectivity of obstetrical aid-II. Clinical examination of the foetus . Examination of the genital tract in cows, in consideration with ultrasonography (Z . Szelényi)
	3 Oct .	5, 6, 7, 8	
3 .	10 Oct .	1, 2, 3, 4	Instruments for obstetrical aid . Theory of forced extraction . Abnormal postures of the head and forelegs; ceasing of these abnormalities (cow, mare) . (O . Szenci)
	17 Oct .	5, 6, 7, 8	
4 .	24 Oct .	1, 2, 3, 4	Abnormal postures of the hindlegs; abnormal positions and presentations; ceasing of these abnormalities (cow, mare) . Introduction of different obstetrical cases (O. Szenci)
	31 Oct .	5, 6, 7, 8	
5 .	7 Nov .	1, 2, 3, 4	Application of the endocrine laboratory tests in the reproductive management: sample taking, handling of the samples, storage, transportation . Basic principle of the stimulation test (challenge test) . Introduction of the progesterone ELISA test. On farm tests. (B. Somoskői)
	14 Nov .	5, 6, 7, 8	
6 .	21 Nov .	1, 2, 3, 4	Semen quality evaluation laboratory tests . Computer Assisted Semen Analysis (CASA) . Investigation of the seminal plasma . production of the sex determined semen. Demonstration of different semen tests. (S. Cseh)
	28 Nov .	5, 6, 7, 8	
Retake of plenaries			
(1-4): 1-2-3-4 groups: 27 Nov . Department and Clinic for Farm Animals, Üllő			
5-6-7-8 groups: 04 Dec . Department and Clinic for Farm Animals, Üllő (5-6):			
According to later information / at the Dept (István street) .			

Budapest, September 6, 2016

*Prof. Sándor
Cseh Head of
Department*

OBSTETRICS AND REPRODUCTION 1.**2017 Fall****Practical Training Program**

for the English Course, 7th Semester

Small groups practicals		
Department and Clinic for Farm Animals, Üllő – 08:15 – by special shedule		
Mondays	Group	Subject
1.	11 Sept .	1, 2, 3, 4
	18 Sept .	5, 6, 7, 8
Education for work safety . The female genital tract in cattle: introduction and demonstration on organs from slaughterhouse . The technique for clinical examination of the genital tract . Rectovaginal technique of intracervical catheterisation (<i>demonstration and practice</i>) I. (<i>lecturer: from Dept. for Farm Animals</i>)		
2.	25 Sept .	1, 2, 3, 4 .
	02 Oct .	5, 6, 7, 8
Clinical examination of the genital tract in cows . (<i>practice</i>) I. (<i>lecturer: from Dept. for Farm Animals</i>)		
3.	9 Oct .	1, 2, 3, 4
	16 Oct .	5, 6, 7, 8
Clinical examination of the genital tract in cows . Recto-vaginal technique of intracervical catheterisation (<i>practice</i>) II. (<i>lecturer: from Dept. for Farm Animals</i>)		
23 October – Holiday		
4.	30 Oct .	1, 2, 3, 4
	6 Nov .	5, 6, 7, 8
Clinical examination of the genital tract in cows . Recto-vaginal technique of intracervical catheterisation (<i>practice</i>) III. (<i>lecturer: from Dept. for Farm Animals</i>)		
5.	13 Nov .	1, 2, 3, 4
	20 Nov .	5, 6, 7, 8
Epidural anaesthesia (demonstration on mare and cow, practice on cow) . Operative interventions on the bovine female genital tract (vaginal prolapse, episiotomy) (<i>practice on organs from slaughterhouse</i>) (<i>lecturer: from Dept. for Farm Animals</i>)		
6.	27 Nov .	1, 2, 3, 4
	04 Dec .	5, 6, 7, 8
Total foetotomy in mare and cow (<i>introduction and practice</i>) (<i>lecturer: from Dept. for Farm Animals</i>)		
Retake of missed practicals: 1-2-3-4 groups: 27 Nov . Department and Clinic for Farm Animals, Üllő 5-6-7-8 groups: 04 Dec . Department and Clinic for Farm Animals, Üllő		

Notes: Students are requested to *be present according to their scheduled clinical days only* (changes are only possible if the student previously asked it from the lecturer) and to *wear white coat* (other colour is also accepted) and *rubber boots (disposable plastic boots, other shoes will not be allowed!)*. Participation will not be allowed without considering these prescriptions!

OBSTETRICS AND REPRODUCTION 2

2018 Spring

Training Program of PLENARY Demonstrations

for the English Course 8th Semester

**Budapest – Hetzel Henrik lecture-hall from
16:15 – 3×45 min**

Wednesdays		Group	Subject
1.	5 Febr .	5, 6, 7, 8	The caesarean section (Indications for the surgery, preparation and the technique of the surgery in ruminants, pigs and horses; video and <i>slide demonstration</i>) (<i>Prof. O. Szenci</i>)
	12 Febr .	1, 2, 3, 4	
2.	19 Febr .	5, 6, 7, 8	Examination of dam and foetus, supervision and the main disorders of parturition in small ruminants . Flock / herd reproduction management (<i>Prof. O. Szenci</i>)
	26 Febr .	1, 2, 3, 4	
3.	5 Mar .	5, 6, 7, 8	Examination of the patient, supervision of the parturition and the main disorders at parturition in pig . Ways to control the parturition . Genital organs of the gilt and sow (demonstration on slaughter house material) . Medicines used at the reproductive management in pig (<i>Prof. O. Szenci</i>)
	12 Mar .	1, 2, 3, 4	
4.	19 Mar .	5, 6, 7, 8	Medical attendance of the dam after parturition (diagnosis and treatment of injuries of the birth canal, ways to facilitate the expelling of the placenta, uterine lavage at various animals) . Caring for the newborn (facilitating the respiration, treatment of the asphyxiated newborn, umbilical care) (<i>Prof. O. Szenci</i>)
	26 March, 2 April – Easter Holiday		
	7 Apr . Saturday	1, 2, 3, 4	The same, as for the other half of the class one week earlier (<i>Prof. O. Szenci</i>)
5.	9 Apr .	5, 6, 7, 8	<i>Introduction</i> of the diagnostic methods and treatments in management of equine reproduction (rectal and ultrasound examination of the ovaries and the uterus, lavage of the uterus, collection of samples for bacteriological, cytological and histological examinations, examination of the cervical smear and the histology of biopsy samples from the endometrium) (<i>Prof. O. Szenci</i>)
	16 Apr .	1, 2, 3, 4	
6.	21 Apr . Saturday	5, 6, 7, 8	Diagnostic methods and treatments in management of equine reproduction (rectal and ultrasound examination of the ovaries and the uterus, lavage of the uterus, collection of samples for bacteriology, cytology and histology, examination of the cervical smear and the histology of biopsy samples from the endometrium) (<i>Prof. O. Szenci and his team</i>)
	30 April – holiday		
	7 May	1, 2, 3, 4	The same, as for the other half of the class one week earlier (<i>Prof. O. Szenci</i>)
7.	14 May	1, 2, 3, 4, 5, 6, 7, 8	Herd-level management of mastitis caused by (1) contagious pathogens and (2) environmental pathogens (<i>Prof. O. Szenci</i>)
Practical retake on Üllő: at the date of the last small group practice			

Students are requested to be present wearing white coat and rubber boots . Trainers/clinicians of the farm animal clinic Üllő ask you to bring forceps, needle-holder, scalpel and scissors with yourself.

OBSTETRICS AND REPRODUCTION 2

2018 Spring Practical Training Program

for the English Course 8th Semester

Üllő: Department and Clinic of Food Animal Medicine 3×45 min . – from 8:15 by special shedule

Wednesdays		Group	Subject
1.	7 Febr .	1, 2, 3, 4	Diagnostic procedures and assistance at parturition . Foetotomy (<i>overview, refreshment, demonstration</i>) (<i>Prof. O. Szenci and his team</i>)
	14 Febr .	5, 6, 7, 8	
2.	21 Febr .	1, 2, 3, 4	Caesarean section in cow (practice of the surgery on animals bought for this purpose) (<i>Prof. O. Szenci and his team</i>)
	28 Febr .	5, 6, 7, 8	
3.	7 Mar .	1, 2, 3, 4	Diagnostic methods and treatment procedures during the uterine involution in cattle (demonstration and practice in cows cae-sectioned one and two weeks earlier) . Preparations widely used for treatment of bacterial complications in uterine involution (<i>Prof. O. Szenci and his team</i>)
	14 Mar .	5, 6, 7, 8	
4.	21 Mar .	1, 2, 3, 4	Caesarean section in sows (practice of the surgery on animals bought for this purpose) (<i>Prof. O. Szenci and his team</i>)
	28 March – Easter Holiday, 4 April – Equus days		
	11 Apr .	5, 6, 7, 8	The same, as for the other half of the class one week earlier (<i>Szenci and his team</i>)
5.	18 Apr .	1, 2, 3, 4	Vasectomy and penis-translocation of the teasing ram (<i>Prof. O. Szenci and his team</i>)
	25 Apr .	5, 6, 7, 8	
6.	2 May	1, 2, 3, 4	Diagnostic methods and treatments in management of equine reproduction (rectal and ultrasound examination of the ovaries and the uterus, lavage of the uterus, collection of samples for bacteriology, cytology and histology, examination of the cervical smear and the histology of bioptic samples from the endometrium) (<i>Prof. O. Szenci and his team</i>)
	9 May	5, 6, 7, 8	
7.	16 May	1, 2, 3, 4	Operative interventions on the bovine udder (injuries and fistulas of the teat and the glandular part of the udder) (<i>practice</i>). Artificial drying-off. Aseptic technique of taking milk samples for bacteriology . Rapid cow side tests used for detection of subclinical mastitis . The most important preparations used in management of mastitis (<i>Prof. O. Szenci and his team</i>)
		5, 6, 7, 8	
Practical retake on Üllő: at the date of the last small group practice			

Students are requested to be present wearing white coat and rubber boots . Trainers/clinicians of the farm animal clinic Üllő ask you to bring forceps, needle-holder, scalpel and scissors with yourself.

Budapest 02-2018

Head of Department: Prof. Dr. Cseh Sándor

PARASITOLOGY

4th year First semester in 2017/2018

Programme of lectures in parasitology

Szept . 13 .	Flatworms, fasciolosis, fascioloidosis
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Szept . 20 .	Paramphistomatidosis, dicrocoeliosis, schistostomatidosis, Tapeworms, diphyllbothriosis
Szept . 27 .	Tapeworm infections of ruminants, carnivores, horse and poultry
Okt . 04 .	Larval cestodosis
Okt . 11 .	Hyostrongylosis, amidostomosis, ollulanosis, trichostrongylidosis
Okt . 18 .	Ancylostomatidosis, strongyloidosis, roundworm infections of carnivores
Okt . 25 .	Roundworm infections of horse, pig, ruminants and poultry . Heterakiosis
Nov . 08 .	Strongylidosis, strongylosis, larval cyathostominosis . Oesophagostomosis, oxyuriasis, trichuriasis, chabertiosis, passalurosis
Nov . 15 .	Syngamosis . Lungworm infections of equines, ruminants and pig
Nov . 22 .	Lungworm infections of carnivores. Dirofilariosis
Nov . 29 .	Trichinellosis, habronematidosis
Dec . 06 .	Spirocercosis, thelaziosis, parafilariosis
Dec . 13 .	Onchocercosis, setariosis, capillariosis, macracanthorchyncosis
Programme of practicum in parasitology	
11-15 Sept	Summarizing review of protozoa
18-22 Sept	Summarizing review of arthropods
25-29 Sept	Laboratory diagnoses of helminth infections . Life cycle of flukes and their intermediate hosts (T)
02-06 Oct	Fasciolosis, dicrocoeliosis, paramphistomatidosis (T)
09-13 Oct	Cestodosis (T)
16-20 Oct	Larval cestodosis (T)
24-27 Oct	Midterm examination
30 Oct- 03 Nov	Morphology and development of nematodes . Gastro-intestinal nematodes (ruminants, swine, goose) (T)
06-10 Nov	Roundworm infections (T)
13-17 Nov	Ancylostomatidosis, strongyloidosis, strongylidosis, strongylosis, cyathostominosis (T)
20-24 Nov	Heterakiosis, oesophagostomosis, oxyuriasis, trichuriasis (T)
27 Nov- 01 Dec	Syngamosis, dictyocaulosis, protostrongylidosis, metastrongylidosis Lungworm infections of carnivores (T)
04-08 Dec	Midterm examination
11-15 Dec	Dirofilariosis, trichinellosis, capillariosis, macracanthorchyncosis

T= written test from the practical topics

Budapest, 11 September 2017

Prof. Dr. Róbert

*Farkas
curator*

POULTRY PATHOLOGY

English 4 .year 2017/2018 1st semester: 11th September – 15th December 2017 .

Lectures in Poultry pathology

Zimmermann (Anatomy) Lecture hall, 1 hour / every week (Friday 09:15–10:00)

Week	Date	Topic	Lecturer
37 .	15 . September	Integumentary system, oro-pharyngeal cavity, oesophagus, crop	dr . Míra Mándoki
38 .	22 . September	Proventriculus, gizzard Small intestines 1 .	dr . Míra Mándoki
39 .	29 . September	Small and large intestines	dr . Zoltán Némét
40 .	06 . October	Liver	dr . Míra Mándoki
41 .	13 . October	Respiratory organs 1 .	dr . Zoltán Némét
42 .	20 . October	Respiratory organs 2 .	dr . Zoltán Némét
43 .	27 . October	Serous body cavity Heart and vessels	dr . Míra Mándoki
44 .	03 . November	Immunorgans (bone marrow, thymus, bursa, spleen)	dr . Ferenc Baska
45 .	10 . November	Locomotive organs 1 .	dr . Míra Mándoki
46 .	17 . November	Locomotive organs 2 .	dr . Míra Mándoki
47 .	24 . November	Urogenital organs	dr . Míra Mándoki
48 .	01 . December	Nervous system	dr . Zoltán Némét
49 .	08 . December	Multicentric tumors . Other diseases	dr . Csaba Jakab
50 .	15 . December	EXAM	dr . Míra Mándoki

Practicals in Poultry pathology

Plenary hall, 2 hours / every second week (Wednesday 14:15-15:45) Teachers: Dr . Míra Mándoki, Dr . Anna Szilasi, Dr . Péter Dobra

Week	Date	TOPIC
38 .	13 . September	Pathology of the broilers 1 .
39 .	20 . September	Pathology of the broilers 2 .
40 .	27 . September	Pathology of the eggs and newly hatched chicks 1 .
41 .	4 . October	Pathology of the eggs and newly hatched chicks 2 .
42 .	11 . October	Pathology of the layers 1 .
43 .	18 . October	Pathology of the layers 2 .
44 .	25 . October	Pathology of the waterfowl 1 .
45 .	01 . November	All Saints' Day (holiday)
46 .	08 . November	Pathology of the waterfowl 2 .
47 .	15 . November	Pathology of the turkeys 1 .
48 .	22 . November	Make-up practical
49 .	29 . November	Pathology of the turkeys 2 .
50 .	06 . December	Exam 1 .
51 .	13 . December	Exam 2 .

Budapest, 29th August 2017 .

Prof Péter Sótónyi

Head of the Department

KÓRSZÖVETTANI GYAKORLATOK / HISTOPATHOLOGY PRACTICALS

2018 .

Téma (Hét)	TÉMA (időpont)	TOPIC (exact dates)
1-2 . (7-8 .)	BEVEZETŐ és ÁLTALÁNOS KÓRTAN (febr . 14, 21 .)	INTRODUCTION and GENERAL PATHOLOGY (13th and 20th of Febr .)
BGy	A kórszövettan alapjai (mintaküldés, mikroszkóp használat, metszetértékelés)	Basic of histopathology (sending sample, using microscope, checking slides)
	Patológiás egyszerű és necrobiotikus zsíros infiltráció	Pathological simple and necrobiotic fatty infiltration
	Zenker-féle izomelhalás (vázizom)	Zenker muscle necrosis in skeletal muscle
	Idült demarkáció	Chronic demarcation
	Tuberculum (bo)	Tubercle (mammal)
3-4 . (9-10 .)	GYULLADÁSOK, DAGANATOK (febr . 28 ., márc . 7 .)	INFLAMMATIONS, TUMORS (27th of Febr ., 6th of March)
SzA	Diffúz gennyes gyull. (phlegmone)	Diffuse purulent inflammation (phlegmone)
	Vérzéses gyulladás	Hemorrhagic inflammation
	Kruppos gyulladás	Fibrinous (croupous) inflammation
	Lymphoma	Lymphoma
	Kompozíciós vegyes daganat	Mixed tumor of the mammary gland
	Mastocytoma	Cutaneous mastocytoma
	Melanoma malignum	Malignant melanoma
	Trichoblastoma	Trichoblastoma
5-6 . (11-12 .)	DAGANATOK (márc . 14 ., 21 .)	TUMORS (13th and 20th of March)
EI	Sarcoma polymorphocellulare	Sarcoma polymorphocellulare
	Fibrosarcoma	Fibrosarcoma
	Fibroma	Fibroma
	Haemangioma cavernosum	Cavernous hemangioma
	Adenocarcinoma	Adenocarcinoma
	Adenoma	Adenoma
	Carcinoma planocellulare keratoides	Squamous cell carcinoma
	Papilloma	Papilloma
13 .	TAVASZI SZÜNET	SPRING HOLIDAY
7-8 . (14-15 .)	MÁJ, BÉL, AGYVELŐ (április 4 ., 11 .)	LIVER, INTESTINES, BRAIN (3rd and 10th of April)
JCs	Félheveny toxikus májdystrophia	Subacute toxic liver dystrophy

	Rubarth betegség	Infectious canine hepatitis (Rubarth d .)
	Májcirrhosis	Liver cirrhosis
	Paratuberculosis	Paratuberculous enteritis
	Parvo virus enteritis	Enteritis caused by parvovirus
	Gennyves lágyagyburok gyulladás	Acute leptomeningitis
	West-Nile encephalitis	West-Nile encephalitis
	List . monocytogenes okozta encephalitis	Encephalitis caused by List . monocytogenes
9-10 . (16-17 .)	TÜDŐGYULLADÁSOK, VESE (április 18 ., 25 .)	LUNG, KIDNEY (17th and 24th of April)
MM	Savós-sejtes tüdőgyulladás	Serous-desquamative bronchopneumonia
	Kruppos tüdőgyulladás	Fibrinous (croupous) pneumonia
	Actinobacillus pleuropneumonia	Pneumonia caused by Actinobacillus pleur .
	Interstitialis pneumonia	Interstitial pneumonia
	Oxalát-nephrosis	Etylen-glicol toxicosis
	Félheveny glomerulonephritis	Subacute glomerulonephritis
	Interstitialis nephritis	Interstitial nephritis
	Vesefibrosis	Kidney fibrosis (end stage kidney)
18 . hét	a Munka ünnepe (május 1 .)	Labor day (1st of May)
19-20 . hét	GYAKORLATI VIZSGA (máj . 9 ., 16 .)	PRACTICAL EXAM (8th and 15th of May)

2018 . február 2 .

*Dr. Mándoki Míra, sk***SPECIAL PATHOLOGY 3.**

**Timetable of the „Special Pathology 3 .” lectures, English 4th year
Friday 10:15–12:00, Anatomy Lecture Hall 5th February–18th May
2015 .**

Time	H	Theme	Topics	DVM
week 6: 9th of February	2	Heart	36 . Developmental anomalies of the heart 37 . Abnormal content in the pericardium; circulatory disturbances and pericarditis 38 . Regressive changes in the heart muscle and their pathologic appearance . Myocarditis . 39 . Endocarditis, endocardosis and their consequences . Organic heart changes (changes of the valves and orifices of the heart) 40 . Changes of cavities and measurements of the heart; cardiomyopathies	MM

week 7: 16 th Febr .	2	Lung 1 .	49. Rhinitis (in general); different rhinitis of swine; malignant catarrhal fever 50 . Tracheitis and bronchitis; infectious bovine rhinotracheitis 51 . Atelectasis and emphysema of the lung 52 . Circulatory disturbances of the lung; pulmonary edema . Fumonisin toxicosis in horse and swine 53. Different forms of pneumonias (catarrhal, fibrinous, aspiration, interstitial, suppurative and embolic) . Mycotic pneumonias	BGy
week 8: 23 rd Febr	2	Lung 2 .	54 . Pathomorphological properties of bovine viral pneumonias 55 . Bacterial pneumonias of cattle . Lung tuberculosis of cattle 56 . Viral pneumonias of swine 57 . Bacterial pneumonias of swine 58 . Pneumonias of small ruminants . Tumors of the ovine respiratory tract	BGy
week 9: 2 nd March	2	Serous membr	59 . Pneumonias of horses . Malleus . Pathological changes due to Rhodococcus equi infection in horses 60 . Pneumonias of carnivores and rabbits 41 . Pathologic changes of the arteries (changes of continuity, stenosis, aneurism, regressive changes, different forms of inflammations) 42 . Abnormal content of the abdominal cavity; peritonitis; feline infectious peritonitis; tumors of the peritoneum 43 . Abnormal content of the thoracic cavity . Pleuritis	JCs
week 10: 9 th March 8:1510:00 !!!!	2	Kidney 1	61 . Glomerulonephrosis 62 . Ischemic and nephrotoxic tubulonephrosis . Chronic copper toxicosis in sheep . 63 . Storage-type nephrosis; tubulonephrosis due to concrement formation 64. Patho- and morphogenesis of different forms of glomerulonephritis (GNs) . Exudative glomerulonephritis 65 . Non-purulent interstitial nephritis; nephritis caused by mycobacteria	MM

week 10: 9 th March	2	Spleen, bone marrow	44 . Lymphadenitis; accumulation of pigments and other materials in the lymph nodes 45 . Circulatory disturbances in the spleen; splenomegalies . Anthrax 46 . Splenitis . Aleutian disease of minks 47 . Swine erysipelas; streptococcus septicaemia of pigs 48. Insufficiency of bone marrow; different types of anemias	JCs
week 10: 10 th March	2	SATURDAY WORKDAY, BUT NO PATHOLOGY D LECTURE		
week 11 .	4-DAY-LONG HOLIDAY (16 th of March, no lecture) -			
week 12: 23 rd March	2	Kidney 2 .	66 . Purulent nephritis and pyelonephritis 67. Renal fibrosis; chronic renal diseases 68 . Hydronephrosis, pyelitis 69 . Nephrolithiasis and related diseases 70 . Pathologic lesions of the urinary bladder . Urocystitis	MM

week 13: 30 th March	SPRING HOLIDAY			
week 14: 6 th April	2	Genital organs	71 . Fluid accumulation in the testis and epididymis . Regressive changes of the testis . Tumors of the testes and the penis 72 . Orchitis, epididymitis 73. Ovarial cysts; inflammation of the ovary and oviducts in mammals 74. Different forms of endometritis and metritis 75 . Death of embryo and foetus; abortion in general	BI
week 15: 13 th April	2	Abortion	76 . Infectious abortions of sheep and cattle 77 . Infectious abortions of swine and rabbits . Fusariotoxicosis of swine 78 . Infectious abortions of horses . Equine rhinopneumonitis and equine infectious arteritis 79. Different forms of mastitis (in general). Mastitis acuta gravis	BI
week 16: 20 th April	2	Bone	80 . Osteopathies (rickets, osteomalatia, osteoporosis, osteodystrophia fibrosa) 81 . Regressive and proliferative changes of bones 82 . Osteomyelitis, periostitis, osteitis 83 . Arthrosis; regressive changes of the cartilage of the joints 84. Regressive and inflammatory changes of muscles 85 . Arthritis; tendinitis . Arthritis of swine, cattle and small ruminants	MM
week 17: 27 th April	2	Brain 1 .	86 . Developmental anomalies of the brain and spinal cord 87 . Dilatation of the cavities of the brain and spinal cord 88 . Regressive changes of the brain and spinal cord (in general) . Diseases with regressive changes of the central nervous system in mammals (transmissible encephalopathies) 89. Encephalitis, myelitis in general; different forms of encephalitis caused by viruses 90 . Rabies . Borna disease; porcine enteroviral encephalomyelitis (Talfan disease; Teschen disease)	BGy

week 18: 4 th May	2	Brain 2 .	91. Aujeszky's disease in different species, especially in swine 92 . Circulatory disturbances of the brain; salt poisoning in swine 93 . Meningitis 94. Different forms of encephalitis caused by bacteria 95 . Canine distemper and its complications . Toxoplasmosis	BGy
week 19: 11 th May	2	Skin, endocrine	96. Regressive changes, inflammation and tumours of peripheral nerves 97 . Functional disturbances and pathological changes in the thyroid gland, adrenal gland and the hypophysis and their consequences 98 . Regressive changes and tumors of the skin 99. Exanthemas; dermatitis (in general); different forms of dermatitis caused by bacteria 100 . Pox virus infections of mammals . Myxomatosis of rabbits; contagious ecthyma of sheep and goats (orf)	JCS

week 20: 18 th May	2	CONSULTATION	MM
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SAMPLE

LECTURE COURSE OF SURGERY II.

**4th Year - 1st semester 2016/2017
(on Tuesdays: 11 .15 – 14 .00)**

Sept 13	Open injuries: classification, symptoms	(3 h)	Dr . Tóth
	Open injuries in particular tissues and organs		
	Wound healing . Regular and irregular wound healing		
Sept 20	Principles and methods of wound management	(3 h)	Dr . Izing
	Necrosis, ulceration, fistulation		
Sept 27	Complicated wound healing . Wound infection .	(2 h)	Dr . Izing
	Surgical aspects of inflammation and anti-inflammatory therapy	(1 h)	Dr .Molnár
Oct 4	Closed mechanical injuries	(3 h)	Dr . Simon
Oct 11	Surgical aspects of antibiotic therapy	(1 h)	Dr . Molnár
	Principles of small animal dentistry	(1 h)	Dr . Dunay
	Principles of large animal dentistry	(1 h)	Dr . Tuska
Oct 18	Surgical aspects of circulatory shock	(3 h)	Dr . Németh
	Emergency patient examination		
Oct 25	Fundamentals of operative surgery	(3 h)	Dr . Németh
Nov 8	Surgery of the head and neck in small animals	(3 h)	Dr . Németh
Nov 15	Surgery of the upper airways in small animals	(3 h)	Dr . Németh
	Surgery of the thorax in small animals		
Nov 22	Surgery of the upper airways in horses	(2 h)	Dr . Bodó
	Surgery of hernias in small animals	(1 h)	Dr . Németh
Nov 29	Colic-diagnostics	(2 h)	Dr . Makra
	Abdominal surgery of the horse I .	(1 h)	Dr . Bodó
Dec 6	Abdominal surgery of the horse II .	(1 h)	Dr . Bodó
	Abdominal surgery of the horse III .	(2 h)	Dr . Bodó
Dec 13	Hernias in horses	(2 h)	Dr . Bodó
	Small animal abdominal surgery		
	The laparotomy . Surgery of the stomach	(1 h)	Dr . Németh
	Végleges tematika	Dr . Németh – Dr . Bodó	

Practical Training Course of Surgery II . in "István street"

**4th Year - 1st semester 2016/2017 (on
Mondays)***

Sept 12, 19	Lameness diagnostics in small animals	(Dr . Zólyomi – Dr . Molnár)
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Sept 26, Oct 3	Neurological examination in small animals	(Dr . Diószegi – Dr . Simon)
Oct 10, 17	Wound management;bandaging in Small Animals	(Dr .Molnár – Dr .Zólyomi)
Oct 24, 31	Emergency patient examination in Small Animals	(Dr . Molnár – Dr . Dunay)
Nov 14, 7	Operative surgery I (wound preparation; suture materials; wound closure; types of sutures)	(Dr . Arany Tóth – Dr . Dunay)
Nov 28, 21	Operative surgery II (wound preparation; suture materials; wound closure; types of sutures)	(Dr . Arany Tóth – Dr . Dunay)
Dec 12, 5	Operative surgery III (wound preparation; suture materials; wound closure; types of sutures)	(Dr . Arany Tóth – Dr . Dunay)

Dates of Practicals (on Mondays):

- **Group 1-2-3-4:** Sept 19, Oct 3, 17, 31, Nov 7, 21, Dec 5
- **Group 5-6-7-8:** Sept, 12, 26, Oct 10, 24, Nov 14, 28, Dec 12

* First dates belong to Group 5, 6, 7 and 8, second dates mean Group 1, 2, 3 and 4, according to the following timetable:

8 .15 – 11 .00: Group 2 or 6

11 .15 – 14 .00: Group 1 or 5

14 .15 - 17 .00: Group 4 or 8

17 .15 – 20 .00 Group 3 or 7

SURGERY III.**4th year - 2nd semester 2017 / 2018**

Lecture course of surgery III . (Thursday: 11 .15-14 .00, 3×45 min)			
Feb 8	Surgery of the liver and the spleen Small animal urogenital surgery I . Surgery of the kidney	Dr . Németh	3 h
Feb 15	Small animal urogenital surgery II . Surgery of the ureter and the urinary bladder Surgery of the urethra	Dr . Németh	3 h
Feb 22	Small animal urogenital surgery III . Surgery of the prostate gland .Cryptorchidism .Castration Surgical aspects of the acute abdomen in small animals .	Dr . Németh	3 h
Mar 1	Lameness examination in small animals I . (diseases of the forelimb)	Dr . Zólyomi	3 h
Mar 8	Lameness examination in small animals II . (diseases of the hindlimb) Principles of bone and joint surgery I . (conservative treatment)	Dr . Ipolyi	3 h
Mar 22	Principles of bone and joint surgery II . (operative treatment)	Dr . Ipolyi	3 h
Apr 5	Fundamentals of small animal neurosurgery	Dr . Ipolyi	3h
Apr 12	Surgery of the urogenital system in horses	Dr . Bodó	3 h
Apr 19	Evaluation of the lame horse	Dr . Bodó	3 h
Apr 26	Diseases of the hoof . Tendon and tendon sheath disorders	Dr . Tóth	3 h
May 3	Principles of fracture repair in horses	Dr . Bodó	3 h

May 10	Aseptic joint diseases (OA, OCD) in horses	Dr . Bodó	3 h
May 17	Septic joint in horses, case discussions	Dr . Bodó	3 h
Practical training course of surgery (István street) (on Wednesdays, 4×45 min)			
Feb 14, 21	Coeliotomy	(Dr. Simon – Dr. Győri)	
Feb 28, Mar 7	Surgery of the Gastrointestinal Tract	(Dr. Simon – Dr. Győri)	
Mar 14, 21	Surgery of the Urogenital Tract	(Dr. Simon – Dr. Győri)	
Apr 11, 18	Practical of surgical diagnostics and therapy I .	(Dr . Simon – Dr . Molnár)	
Apr 25, May 2	Practical of surgical diagnostics and therapy II .	(Dr . Simon – Dr . Molnár)	
May 9, 16	Practical of surgical diagnostics and therapy III .	(Dr . Simon – Dr . Molnár)	

Schedule:

* The first date belongs to Group 1-2-3-4, the second date is for Group 5-6-7-8, according to the following timetable:

8 .15 – 11 .45 : Group 1, 2 or 7, 8

13 .00 – 16 .30 : Group 3, 4 or 5, 6

VETERINARY TOXICOLOGY**2017/2018 . I . semester, Time of lectures: Thursday 10 .15-12 .00**

Topics of lectures in Veterinary Toxicology		
Week 1 14th Sept .	Introduction to toxicology, sources of poisonings . Toxicokinetics, toxicodynamics .	Dr. Ákos Jerzsele
Week 2 21st Sept	Factors influencing toxicity. Diagnosis and treatment of poisonings .	Dr. Ákos Jerzsele
Week 3 28th Sept	Ethylene glycol poisoning	Dr. Ákos Jerzsele
Week 4 5th Oct	Pesticides I . Rodenticides	Dr. Ákos Jerzsele
Week 5 12nd Oct	Pesticides II . Insecticides	Dr. Csaba Kővágó
Week 6 19th Oct	Pesticides III . Herbicides, molluscicides, fungicides	Dr . Erzsébet Gere
Week 7 26th Oct	Drug poisonings	Dr. Ákos Jerzsele
Week 8 2nd Nov	Metal poisonings I . Mercury, lead, arsenic, selenium, iron, copper, zinc	Dr . Erzsébet Gere
Week 9 9th Nov	Feed and water associated poisonings (NaCl, urea, nitratenitrite, ionophores)	Dr . György Csikó
Week 10 16th Nov	Industrial toxicoses (cadmium, fluoride, PCB-s, dioxins) Household poisonings: acids, alkali, detergents, perfumes	Dr . Zita Karancsi

Week 11 23th Nov	Toxic gases	Dr . György Csikó
Week 12 30th Nov	Toxicology of mycotoxins	Dr . György Csikó
Week 13 7th Dec	Plant poisonings	Dr . Orsolya Farkas
Week 14 14th Dec	Poisonings of animal origin	Dr. Csaba Kóvágó

Budapest, 29 .08 .2017 .

Prof. Dr. Péter Gálfi
Head of Department

5TH YEAR

SAMPLE

ANIMAL HEALTH ECONOMICS, MANAGEMENT AND ETHICS

Last change: 04 .02 .2018 20:08

Course	Animal health economics, management and ethics
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	5/2
Credits	2
Lectures	30 lessons/semester
Practical lessons	0 lessons/semester
Specialization	veterinary (English)
Department	Department of Veterinary Forensics, Law and Economics

DESCRIPTION

Course leader: dr. László Ózsvári

- -Microeconomics and the subject of animal health economics
- -Economic decisions in animal health work
- -Production function, types of cost and cost functions
- -Methods to calculate the economic losses due to animal diseases . Partial budgeting
- -Economic aspects of herd health management in pig herds
- -Economic aspects of herd health management in cattle herds
- -Cost-benefit analysis
- -Decision analysis
- -Farm budget
- -The environment of veterinary business
- -The basic elements and different strategies of
- -The role and tasks of the Veterinary Chamber (chamber membership, license, regulations, laws and obligations)
- -Legal aspects of veterinary practice (firms, contracts, responsibility)
- -Marketing aspects of veterinary practice (pricing, promotion, place, etc .)
- -Communication and conflict management in veterinary businesses
- -How to start up a veterinary clinic (business plan)
- -Financial aspects and evaluation of veterinary practices
- -Accounting and taxation aspects of veterinary businesses
- -The trade of animal drugs and pet food
- -Carrier-building
- -Ethical aspects of veterinary practice

ANIMAL HEALTH ECONOMICS

Year 2017/2018 . II . semester

	Date	Topics	Lecturer	No . of hours
1 .	II . 5 . (Monday)	General introduction . Economic decision-making in animal health management	Dr. László ÓZSVÁRI	2
2 .	II . 12 . (Monday)	Production function, costs, cost functions	Dr. László ÓZSVÁRI	2
3 .	II . 19 . (Monday)	Partial budgeting	Dr. László ÓZSVÁRI	2
4 .	III . 26 . (Monday)	Cost-benefit analysis	Dr. László ÓZSVÁRI	2
5 .	III . 05 . (Monday)	Decision analysis	Dr. László ÓZSVÁRI	2
6 .	III . 12 . (Monday)	Farm budgets for livestock	Dr. László ÓZSVÁRI	2
7 .	III . 19 . (Monday)	Herd health economics of swine	Dr. László ÓZSVÁRI	2
8 .	III . 26 . (Monday)	SPRING BREAK	–	–
9 .	IV . 7 . (Saturday)	Herd health economics of cattle	Dr. László ÓZSVÁRI	2
10 .	IV . 9 . (Monday)	Vet practice management	Dr. László ÓZSVÁRI	
11 .	IV . 16 . (Monday)	Marketing management	Dr. László ÓZSVÁRI	2
12 .	IV . 21 . (Saturday)	Financial planning and pricing	Dr. László ÓZSVÁRI	2
13 .	IV . 23 . (Monday)	Practice valuation (buying-selling)	Dr. László ÓZSVÁRI	2
14 .	V . 7 . (Monday)	Business planning	Dr. László ÓZSVÁRI	2
15 .	V . 14 . (Monday)	Investment decisions	Dr. László ÓZSVÁRI	2

Place of lectures: Zlamál lecture-hall

Time of lectures: Monday 10,15-11,45

Exam: Written

Course leader: dr. László ÓZSVÁRI

ANIMAL HYGIENE II

Last change: 21 .11 .2017 15:06

SUBJECT OF LECTURES IN DETAIL

Theoretical lectures and progress diary of Animal Hygiene (Veterinary Preventive Medicine) and Herd-Health, Autumn, 9th semester, from 11st Sept . 2017 . to 15th Dec . 2017 .)

- 1 . Herd health management of table rabbit production . (Breeds . Breeding management . Housing .) Management and nutrition related multifactorial diseases of rabbit and its' prevention . 14th September . (1) Dr . András Adorján

2. Significance of poultry production (Biological fundamentals, economic considerations, management systems of egg production, vertical integration of poultry production) .
3. Relevance of the non-specific preventive measures in poultry flocks (service period, hygienic conditions of the production environment and its control)
Specific measures of controlling poultry diseases (Planning and application of vaccination programmes . Characteristics of vaccination programmes in the egg and broiler production . Checking of the results of vaccination programmes). Role and significance of hatcheries in spreading and prevention of poultry diseases .
15th September . (2) Dr . András Adorján
- 4 . Animal hygienic aspects of broiler chicken production . Housing technologies . Management and nutrition related diseases in broiler production and their prevention .
21st September. (1) Dr. László Kőrösi
- 5 . Animal hygienic aspects of duck production . (Goals of production . Breeds . Housing and management technologies . Breeding management .)
- 6 . Animal hygienic aspects of broiler duck production . Main management and nutrition related multifactorial diseases of ducks and their control .
22nd September . (2) Dr . András Adorján
- 7 . Animal Hygiene of goose production I . Goals of production . Breeds . Housing and management . Feather plucking . Cramming . Breeding management .
28th September . (1) Dr . András Adorján
- 8 . Animal Hygienic aspects of turkey production . (Goals of production . Breeds . Housing and management technologies . Breeding management .)
- 9 . Main management and nutrition related multifactorial diseases of turkey and their control . 29th September . (2) Dr . András Adorján
- 10 . Production oriented, planned veterinary programmes for poultry production (health control of flocks, check lists, diagnosis, monitoring and administration of the health status, collaboration between animal health service and management of the poultry production units) .
5th October . (1) Dr . András Adorján
- 11 . Main characteristics and international trends of the dairy cattle milk production . The aim and principles of cattle herd health programmes (management cycle, man-agement structure of a dairy farm, herd health and production management protocol)
- 12 . Herd-health management of the metabolic disorders of dairy cows I . Disorders of energy- and acid-base metabolism . Risk factors, prevalence and prevention
6th October (2) Dr . Endre Brydl
- 13 . Herd-health management of the metabolic disorders of dairy cows II . Disorders of protein-, mineral- and vitamin metabolisms . Risk factors, prevalence and prevention . 12nd October (1) Dr . Endre Brydl
- 14 . Mastitis as herd disease (importance, definitions) The types of mastitis in dairy cattle. The characteristics of the clinical and subclinical mastitis . Diagnostical tools . Treatment of mastitis .
- 15 . Factors affecting the development of mastitis. Predisposing factors. Alignment of mastitis pathogen microorganisms .
13rd October (2) Dr . Péter Kovács

16. Metabolic profile tests (relevance, execution and the possibility of their use in the veterinary herd-health practice) . Relevant metabolic parameters of dairy cows, and interpretation of the normal or pathological range of their values .
19th October (1) Dr . Endre Brydl
- 17 . Contagious mastitis pathogens . Control of contagious mastitis pathogens in a dairy herd . Environmental mastitis pathogens . Control of environmental mastitis pathogens in a dairy herd .
- 18 . In between mastitis pathogens . Hygienic milk sampling methods . Evaluation of microbiological and antibiogram result. Herd specific mastitis control programs
20th October (2) Dr . Péter Kovács
- 19 . Herd health and management of dairy cattle . Housing management and technologies . Examples on the effects of keeping conditions on production and health of cattle.
Novel methods and tools in the monitoring of herd-health and performance of dairy cows . 26th
October (1) Péter Hejel
20. Animal hygienic and herd health aspects of raising calves. Influential factors on calves' health and performance . Importance and control of colostrum supply . Housing technologies and nutrition management of calves .
- 21 . Management related, bacteriological, viral and parasitological diseases of calves . Methods of control .
27th October (2) Dr . László Könyves
- 22 . Monitoring of reproductive performance of dairy herds . Reproduction management of dairy cattle. Risk factors affecting reproduction. Management tools and activities for improvement of fertility .
2nd November (1) Dr . László Könyves
- 23 . Diseases of the bovine digit . Functional hoof trimming .
- 24 . Monitoring and preventive measures of hoof disorders .
3rd November (2) Dr . János Lehoczky
- 25 . Animal hygienic aspects of beef production . Important breeds . General aspects of management . Forms of fattening .
9th November (1) Dr . László Könyves
- 26 . Main management related (multifactorial) diseases in beef herds . Risk factors and preventive measures .
- 27 . Monitoring of reproductive performance of beef herds . Reproduction management of beef cattle . Health management of mating bulls .
10th November (2) Dr . László Könyves
- 28 . Production oriented, planned veterinary programmes for the swine industry (advances in health control, components of the planned animal health and production program, check lists)
16th November (1) Dr . Pál Rafai
- 29 . Management and organisation of the pig production (breeds, pure breeding, hybridisation programmes, breeding pyramid, breeding organisations) .
- 30 . Management and housing technologies in the pig production (mono-, bi and three-phase housing systems, flow-chart of operation, farrowing systems, housing of weaned pigs, fattening systems, housing of the sow)
17th November (2) Dr . Eszter Losonczy
- 31 . Practical auditing of welfare in livestock production (primary producers, transport, slaughter) 23th
November (1) Dr . Viktor Jurkovich

- 32 . Animal hygienic aspects of sheep production . Production branches . Breeding management . Management of the pregnant ewes .
- 33 . Management of the broiler lamb production . (Housing and climatic requirements . Management related, bacteriological, viral and parasitological diseases of broiler lambs . Methods of control .) 24th November (2) Dr . Viktor Jurkovich
- 34 . Animal hygienic aspects of goat production . General aspects of management . Important breeds . Keeping technologies . Herd health and reproduction management of dairy goats . 30th November (1) Dr . László Könyves
- 35 . Herd health management of reproduction . (Monitoring of the reproductive performance, environmental factors that affect litter size, environmental factors that affect the nonproductive days of gilts and sows, most frequent complaints)
- 36 . The periparturient disease complex of the sow, leg disorders and culling strategies 1st December (2) Dr . Eszter Losonczi
- 37 . Herd health management from farrowing till weaning (pre-weaning mortality – risk factors, postparturient losses, examination of pigs in the farrowing area)
7th December (1) Dr . Eszter Losonczi
- 38 . Herd health programme from weaning to the end of the post-weaning period (factors that affect weight gain after weaning, bacterial and viral diseases around weaning, prevention of peri-weaning enteric diseases)
- 39 . Herd health management of the fattening pig . Postweaning multisystemic wasting syndrome . Management practices to reduce expensive feed wastage .
8th December (2) Dr . Eszter Losonczi
- 40 . Pathomorphological data collection in slaughterhouse, analysis and reporting . 14th December . (1) Dr . Norbert Solymosi
- 41 . Herd health control of the Porcine Respiratory Disease Complex (PRDC) I . (basic principles, diagnosis at herd level)
- 42 . Herd health control of the Porcine Respiratory Disease Complex (PRDC) II . (control measures) 15th December (2) Dr . Pál Rafai Budapest, 31st August 2017 .

***Dr. habil László Könyves PhD
associate professor, head of the
Department of Animal Hygiene,
Herd Health and Veterinary
Ethology***

EPIDEMIOLOGY, INFECTIOUS DISEASES I.**Last change: 14 .09 .2017 09:46**

Course	Epidemiology, infectious diseases I .
Language	English
Nature	mandatory
Method of evaluation	state exam
Year/semester	5/1
Credits	3
Lectures	75 lessons/semester
Practical lessons	10 lessons/semester
Specialization	veterinary (English)
Department	Department of Microbiology and Infectious Diseases

DESCRIPTION

Description of the subject, acquired knowledge	The subject „Infectious diseases” is taught from the foundation of the school . Since infectious diseases have always been very important in Hungary the subject receives a special emphasis in the curriculum . It comprises general epidemiology, infectious diseases of animals caused by viruses, prions and bacteria. In the case of the different infectious diseases the history, occurrence, aetiology, epidemiology, pathogenesis, clinical signs, pathologic lesions, diagnostic methods, differential diagnostics, treatment, prevention, control, food hygienic and public health significance are discussed. Teaching is carried out in the form of lectures and practicals .
Prerequisites	Immunology, Internal medicine 2, Pathology 3
Competencies	<p>After absolving the subject the students will be able to</p> <ul style="list-style-type: none"> • recognise and differentiate the different infectious disease, • introduce measures in order to prevent spreading of the disease, • collect samples to laboratory diagnostic examination, transport them to the laboratory, and evaluate the results of the laboratory diagnostic examinations, • treat the diseased animals, • implement the necessary preventive and control measures, • introduce measures in order to prevent human infections, • prepare expertise regarding the disease, • inform the owner and the workers in contact with the animals on the further treatment and prevention, • inform the official veterinary service and the human health service in statutory cases, • inform the public on the disease .

Teaching staff	<ul style="list-style-type: none"> • Bakonyi, Tamás Professor • Fodor, László Professor • Varga, János Professor emeritus
Plenary practicals	<ul style="list-style-type: none"> • The topic of the plenary practicals is the differential diagnosis of infectious diseases of the different animal species. • Attending the plenary practicals is compulsory . In case of absence – including justified ones (e.g. clinical work) – missing practicals have to be retaken . Retake happens in the form of a written exam at 7 .15 on the 4th December in the Hetzel lecture hall . • Plenary practicals are held in the form of two-hour-long sessions on the dates published on the homepage .
Teaching environment	Computer aided lectures are given in one of the lecture theatres of the campus (Monday: Plósz lecture hall; Friday: Magyary-Kossa lecture hall) . Clinical signs and lesions of certain diseases are shown on video film and slides . Plenary practicals are held in the Marek lecture hall .
Recommended literature	<ul style="list-style-type: none"> • Aiello, S .E . (Ed . ch .): The Merck Veterinary Manual 11th Ed . Merck & Co . Inc . 2016 • Divers, T .J – Peek, S . (Eds .): Rebhun’s Diseases of Dairy Cattle 2nd Ed .Elsevier, 2008 • Greene, C .E . (Ed .) Infectious diseases of the dog and cat . Saunders, 2012 . • Gyles, C .L . et al . (Eds): Pathogenesis in bacterial infections in animals . 4th Ed . Wiley-Blackwell, 2010 . • http://www .oie .int • Sellon, D .C ., Long, M .T . (Eds) Equine infectious Diseases . 2nd Ed . Elsevier, 2013 . • Swayne, E .D . (Ed . ch .): Diseases of poultry . 13th Ed . Blackwell . 2013 • Timoney, J .F . et al . (Eds .): Hagan and Brunner’s Microbiology and Infectious Diseases . 8th Ed . Comstock Publishing Associates 1988 . • Zimmerman, J .J . et al . (Eds .): Diseases of swine . 10th Ed . WileyBlackwell, 2012 . • Downloadable documents (password is in Neptun): Power point presentations from the previous academic year are uploaded in order to support students in making own notes . At the end of the semester power point documents of the actual year will be uploaded

SUBJECT OF LECTURES IN DETAIL

Date	Topic
11 .09 .	General epidemiology .
15 .09 .	General epidemiology .
18 .09 .	Diseases caused by circoviruses
22 .09 .	Diseases caused by parvoviruses, papilloma viruses and polyoma viruses
25 .09 .	Diseases caused by adenoviruses .
29 .09 .	IBR, herpesmamillitis, malignant catarrhal fever, Aujeszky disease, inclusion body rhinitis, equine herpesviral diseases

02 .10 .	Canine herpesviral disease, feline infectious rhinotracheitis, infectious laryngotracheitis, duck plague, herpesviral disease of pigeons .
06 .10 .	Marek disease, diseases caused by poxviruses, orthopox diseases, pseudocowpox, bovine papular stomatitis, contagious pustular dermatitis
09 .10 .	Sheep, goat pox, lumpy skin disease, swine pox, myxomatosis, fowl pox
13 .10 .	African swine fever, diseases caused by picornaviruses (Teschovirus encephalomyelitis, swine vesicular disease, avian encephalomyelitis, duck viral hepatitis, encephalomyocarditis . Avian nephritis .
16 .10 .	Foot and mouth disease .
20 .10 .	Diseases caused by caliciviruses (vesicular exanthema of swine, feline calicivirus infection, rabbit haemorrhagic disease, EBHS . Diseases caused by reoviruses (bluetongue, African horse sickness, equine encephalosis) .
27 .10 .	Equine viral encephalomyelitis. Diseases caused by flaviviruses (tick borne encephalitis, louping ill, flaviviral diseases transmitted by mosquitoes, BVD, Border disease) .
30 .10 .	Classical swine fever .
02 .11 .	Diseases caused by reoviruses (diseases caused by rotaviruses, orthoreoviruses, poultry diseases caused by reoviruses) . Infectious bursitis .
03 .11 .	Diseases caused by bunyaviruses . Diseases caused by orthomyxoviruses (swine influenza, equine influenza, avian influenza).
06 .11 .	Diseases caused by paramyxoviruses (Parainfluenza, rinderpest, PPR, canine distemper) .
10 .11 .	Diseases caused by paramyxoviruses . (Newcastle disease, Hendra, Nipah, disease caused by bovine respiratory syncytial virus, avian metapneumovirus infections) .
13 .11 .	Diseases caused by coronaviruses . (TGE, porcine epidemic diarrhoea, haemagglutinating encephalomyelitis of pigs, coronaviral disease of cattle) .
17 .11 .	Diseases caused by coronaviruses (feline infectious peritonitis, coronaviral enteritis of dogs, infectious bronchitis of chicken, coronaviral enteritis of turkey) . Diseases caused by arteriviruses (equine infectious arteritis, PRRS) .
20 .11 .	Diseases caused by rhabdoviruses (vesicular stomatitis, ephemeral fever, rabies) .
24 .11 .	Diseases caused by rhabdoviruses (rabies) . Diseases caused by retroviruses (enzootic bovine leukosis, ovine pulmonary adenomatosis, feline leucosis) .
27 .11 .	Diseases caused by retroviruses (avian leucosis, reticuloendotheliosis, maedivisna, caprine arthritis-encephalitis) .
01 .12 .	Equine infectious anaemia, acquired immune deficiency of animals. Bornai disease . Transmissible encephalopathies .
04 .12 .	Anthrax .
08 .12 .	Diseases caused by clostridia (gas gangrenic diseases) .
11 .12 .	Diseases caused by clostridia (enterotoxaemic diseases, intoxications, clostridial diseases of poultry) . Staphylococcosis, straptococcosis .
15 .12 .	Reserve

SUBJECT OF PRACTICALS IN DETAIL

Date	Topic
09 .10-13 .10 .	General aspects of diagnosis of infectious diseases, sampling to laboratory examinations, transportation of the samples .
16 .10-20 .10 .	Differential diagnosis of infectious diseases of cattle caused by viruses.
23 .10-27 .10 .	Differential diagnosis of infectious diseases of dogs and cats caused by viruses.
06 .11-10 .11 .	Differential diagnosis of infectious diseases of poultry caused by viruses.
13 .11-17 .11 .	Differential diagnosis of infectious diseases of swine caused by viruses.
20 .11-24 .11 .	Differential diagnosis of infectious diseases of horses caused by viruses.
04 .12 7:15	Retake

EPIDEMIOLOGY, INFECTIOUS DISEASES II.

Last change: 13 .02 .2018 13:17

Course	Epidemiology, infectious diseases II .
Language	English
Nature	mandatory
Method of evaluation	state exam
Year/semester	5/2
Credits	7
Lectures	60 lessons/semester
Practical lessons	20 lessons/semester
Specialization	veterinary (English)
Department	Department of Microbiology and Infectious Diseases

DESCRIPTION

The subject „Infectious diseases” is taught from the foundation of the school . Since infectious diseases have always been very important in Hungary, the subject receives a special emphasis in the curriculum . It comprises general epidemiology, infectious diseases of animals caused by viruses, prions and bacteria. In the case of the different infectious diseases the history, occurrence, aetiology, epidemiology, pathogenesis, clinical signs, pathologic lesions, diagnostic methods, differential diagnostics, treatment, prevention and control are discussed however the most important aspects of food hygiene and public health are also mentioned . Teaching is carried out in the form of lectures and plenary practicals .

COMPETENCES

- After absolving the subject the students will be able to
- recognise and differentiate the different infectious disease,
- introduce measures in order to prevent spreading of the disease,
- collect samples to laboratory diagnostic examination, transport them to the laboratory, and evaluate the results of the laboratory diagnostic examinations,
- treat the diseased animals,

- implement the necessary preventive and control measures,
- introduce measures in order to prevent human infections,
- prepare expertise regarding the disease,
- inform the owner and the workers in contact with the animals on the further treatment and prevention,
- inform the official veterinary service and the human health service in statutory cases, • inform the public on the disease .

PRECONDITION • Epidemiology, infectious diseases I ., Virology, Bacteriology, Immunology

TEACHERS

- Bakonyi, Tamás dr . professor
- Fodor, László dr . professor
- Makrai, László dr . associate professor

PLENARY PRACTICALS

- The plenary practicals focus on the differential diagnosis of infectious diseases of animals.
- Attending the plenary practicals is compulsory, in case of absence, including justified ones, they have to be retaken . Retake happens in the form of a written or oral exam at the end of the semester .
- Plenary practicals are held in two-hour-long classes on the dates published on the homepage .

LABORATORY DIAGNOSTIC PRACTICAL

- After the successful examination the students will have a 2-week-long “Laboratory diagnostic practical” at the Veterinary Diagnostic Directorate of the National Food Chain Safety Office (NÉBIH), at different departments of the school or at diagnostic institutes abroad. The practical is evaluated and certified by the supervisor of the institution, and the students have to give a presentation on their activity during the practical at the examination .

TEACHING ENVIRONMENT

Computer aided lectures are given in lecture theatres of the campus as published in the timetable . Clinical signs and lesions of certain diseases are shown on video film and slides. Plenary practicals are also held in one of the lecture theatres . Power point presentations of the previous academic year can be downloaded in pdf files from the homepage in order to help writing own notes.

RECOMMENDED LITERATURE

- Aiello, S .E . (Ed . ch .): The Merck veterinary manual 11th Ed . Merck& Co . Inc . 2016
- Divers, T . J ., Peer, S . (Ed .) Rebhun’s diseases of dairy cattle 2nd Ed . Elsevier, 2008
- Greene, C . E . (ed .): Infectious Diseases of the Dog and Cat . Saunders, 2012 .
- Gyles, C . L . - Prescott, J . F . - Songer, J . G . - Thoen, C . O . (ed .): Pathogenesis in Bacterial Infections in Animals . Ames: Wiley-Blackwell, 2010 .
- Sellon, D . C . - Long, M . T . (ed .): Equine Infectious Diseases . Elsevier, 2007 .
- Swayne, D . E . (Ed .): Diseases of poultry 13th Ed . Wiley-Blackwell, 2013
- Timoney, J . F . [et al .]: Hagan and Brunner’s Microbiology and Infectious Diseases of Domestic Animals . 8th ed . Ithaca: Cornell Univ . Press, 1988 .

- Zimmermann, J . J . , Karkker, L . A . , Ramirez, A . , Kent, J . , Schwartz, K . J . , Stevenson, G . W . (eds .): Diseases of swine . 10th Ed . Wiley-Blackwell, 2012

DOWNLOADABLE DOCUMENTS

- Downloadable power point presentations available on the homepage are from the previous academic year, they can be used to help following the lectures . In the last two weeks of the semester the power point presentations of the present year will be uploaded . • Subpages

Subject of lectures in detail

Subject of practicals in detail

Evaluation

Exam informations Download

SUBJECT OF LECTURES IN DETAIL

Dates	Topics	Hour
6 th February	Streptococcoses, Staphylococcoses	2
8 th February	Erysipelas, Listeriosis	1
	Diseases caused by Corynebacteria	1
13 th February	Tuberculosis	2
15 th February	Tuberculosis, paratuberculosis	2
20 th February	Actinomycosis, nocardiosis, dermatophilosis, diseases caused by R . equi	2
22 nd February	Diseases caused by E . coli	2
27 th February	Diseases caused by E . coli	1
	Necrobacillosis, panaritium	1
1 st March	Salmonellosis	2
6 th March	Salmonellosis	2
8 th March	Salmonellosis, Yersiniosis	2
13 th March	Pasteurellosis	2
12 th March	Pasteurellosis (12 .15-14 .00 Magyary-Kossa lecture hall)	2
20 th March	Pasteurellosis, anaplasmosis, ornithobacteriosis	2
22 nd March	Actinobacillosis, haemophilosis, CEM	2
3 rd April	Brucellosis	2
5 th April	Brucellosis	2
10 th April	Tularaemia	1
	Diseases caused by Bordetellae and bartonellae	1
12 th April	Diseases caused by Campylobacter spp ., proliferative enteropathies of swine	2
17 th April	Diseases caused by Moraxellae, malleus	2
19 th April	Diseases caused by Spirochaetes	2
24 th April	Diseases caused by Spirochaetes	2

26 th April	Diseases caused by Spirochaetes	2
3 rd May	Mycoplasmoses	2
8 th May	Mycoplasmoses	2
10 th May	Chlamydioses	2
15 th May	Q-fever, Rickettsioses	2
17 th May	Signature	2

SUBJECT OF PRACTICALS IN DETAIL

Dates	Topics
5-9 February	--
12-16 February	Differential diagnosis of diseases of sheep and goats caused by viruses.
19-23 February	Differential diagnosis of diseases of cattle caused by bacteria.
26 February-2 March	Differential diagnosis of diseases of swine caused by bacteria.
5-9 March .	Differential diagnosis of diseases of horses caused by bacteria.
12-16 March .	--
19-23 March	--
26-30 March	Easter holiday
2-6 April	Differential diagnosis of diseases of sheep and goats caused by bacteria.
9-13 April	Differential diagnosis of diseases of poultry caused by bacteria.
16-20 April	Differential diagnosis of diseases of dogs and cats caused by bacteria.
23-27 April	--
30 April-4 May	--
8th May 7 .15	Retake in Hetzel Henrik lecture hall
14-18 May	--

FOOD HYGIENE II LECTURES**Academic year 2017/2018, Semester 10**

week	Date d/m	Topics	Name of lecturer
1	07/02	Definition, ageing, composition and properties of meat	Orsolya Erdősi
	08/02	Basic terms of meat inspection . <i>Ante mortem</i> inspection at the farm and slaughterhouse	Orsolya Erdősi
2	14/02	<i>Post mortem</i> meat inspection, meat inspection diagnosis	Orsolya Erdősi
	15/02	Decisions concerning meat, animal health marking, specific risk materials, slaughterhouse waste	Orsolya Erdősi
3	21/02	Technological hygiene of slaughter of swine	Orsolya Erdősi
	22/02	Technological hygiene of slaughter of ruminants	Orsolya Erdősi

4	28/02	Meat inspection of pigs	Orsolya Erdősi
	01/03	Meat inspection of ruminants	Orsolya Erdősi
5	07/03	Technological hygiene of poultry and lagomorphs slaughter, meat inspection of poultry and rabbit	Orsolya Erdősi
	08/03	Hygiene of game processing, meat inspection of farmed and hunted wild game	Orsolya Erdősi
6	14/03	Hygiene conditions and official control of the processing of fishery products and the production of live bivalve molluscs	József Lehel
7	21/03	Hygiene of egg production and the manufacture of eggproducts, inspection of eggs and egg-products	Orsolya Erdősi
	22/03	Judgement of meat: septicaemic conditions, organoleptic changes	Orsolya Erdősi
8	26-30/03	SPRING BREAK	
9	04/04	Production and processing hygiene of foodstuffs of plant origin	József Lehel
	05/04	Judgement of meat: OIE listed diseases I	Orsolya Erdősi
10	11/04	Judgement of meat: OIE listed diseases II	Orsolya Erdősi
	12/04	Judgement of meat: animal diseases/infections not included in the OIE list	Orsolya Erdősi
11	18/04	Official food control: legal regulation, organisation, types and tasks	Orsolya Erdősi
	19/04	Official food control: basis of the risk-based official controls	Orsolya Erdősi
12	25/04	Official food control: registration and approval of food business establishments, audit of good hygiene practices and the HACCP system	Orsolya Erdősi
	26/04	Official food control: control of the traceability system and the compliance with microbiological criteria, the rules of official sampling	Orsolya Erdősi
13	02/05	Official control of the distribution of foodstuffs: transport and wholesale storage	Orsolya Erdősi
	03/05	Official control of the distribution of foodstuffs: retail establishments	Orsolya Erdősi
14	09/05	Official control of catering services and mass caterers I	Orsolya Erdősi
	10/05	Official control of catering services and mass caterers II	Orsolya Erdősi
15	16/05	Official control of international trade of foods	Orsolya Erdősi
	17/05	Control of small scale food production /processing/marketing, measures in the event of non-compliance, sanctions	Orsolya Erdősi

PRACTICALS OF FOOD HYGIENE II
2017/2018 Spring-term (Semester 10)

Week	Date	Topics	Name of practical leader
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	02/05-09	Food hygiene significance and examination of water	Orsolya Erdősi
2 .	02/12-16	Examination of properties of meat and its organoleptic alterations	Orsolya Erdősi
3 .	02/19-23	Practical aspects of meat inspection	Orsolya Erdősi
4 .	02/26-03/02	Technological and food hygiene aspects of processing of cured meat products	Lívía Darnay Dániel Pleva
5 .	03/05-09	Technological and food hygiene aspects of processing of stuffed meat products 1. (raw-smoked and fermented meat products)	Lívía Darnay Dániel Pleva
6 .	03/12-16	Technological and food hygiene aspects of production of canned products	Lívía Darnay
7 .	03/19-23	Technological and food hygiene aspects of processing of stuffed meat products 2. (cooked, smoked meat products)	Lívía Darnay Dániel Pleva
8 .	03/26-30	SPRING BREAK	
9 .	04/03-06	Meat inspection of fish and other aquatic animals	József Lehel
10 .	04/09-13	Inspection of egg and egg-products	Orsolya Erdősi
11 .	04/16-20	Labelling and packaging of food	Lívía Darnay
12 .	04/23-27	Inspection of establishment producing food of plant origin	József Lehel Katalin Lányi
13 .	04/30-05/04	Significance and utilization of food waste	Katalin Lányi József Lehel
14 .	05/07-11	Case studies – Actual food hygiene questions	Katalin Lányi József Lehel
15 .	05/14-18	Supplementary practical	

FORENSIC VETERINARY MEDICINE

2017/2018, 10th semester

Date	Hours	Topic	
7 February	3	Introduction Courts of law, public prosecutors Law of procedures	dr . Csintalan Csaba
14 February	3	Law of contracts, Warranty	dr . Csintalan Csaba
21 February	3	Law of torts	dr . Csintalan Csaba
28 February	2	Evidences, witness testimony, Veterinary expert opinion	dr . Csintalan Csaba
7 March	3	Criminal procedure	dr . Csintalan Csaba
14 March	3	Criminal liability of the veterinarian	dr . Csintalan Csaba
21 March	3	Mid-term examination Forensic aspects of infectious diseases	dr . Csintalan Csaba
4 April	3	Forensic aspects of small animal diseases Forensic aspects of ruminant diseases	dr . Csintalan Csaba

11 April	3	Forensic aspects of equine diseases Forensic aspects of reproductive disorders	dr . Csintalan Csaba
18 April	3	Forensic aspects of abuse to animals Forensic aspects of behavioral problems	dr . Csintalan Csaba
25 April	3	Forensic aspects of pig diseases Forensic aspects of poultry diseases	dr . Csintalan Csaba
2 May	3	Expert opinions regarding toxicoses Expert opinions regarding injuries Mid-term examination re-take	dr . Csintalan Csaba

Time of lectures: Wednesday 10 .30-13 .00

Place of lectures: Zlamál lecture-hall

Preliminaries of the signature : attendance of the lectures, passing the mid-term examination

INTERNAL MEDICINE 3

Last change: 09 .09 .2016 14:19

Course	Internal Medicine 3
Language	English
Nature	mandatory
Method of evaluation	final exam
Year/semester	5/1
Credits	6
Lectures	36 lessons/semester
Practical lessons	15 lessons/semester
Specialization	veterinary (German)
Department	Department and Clinic of Internal Medicine

DESCRIPTION

Semester	Topic	Number of lessons (lectures/practical lessons)	Method of evaluation (practical course grade, exam, final exam)
7 .	Veterinary internal medicine 1 .	45/30	PCG (=practical course grade)
8 .	Veterinary internal medicine 2 .	60/45	PCG
9 .	Veterinary internal medicine 3 .	36/0	FE(= final exam)

Brief description of the taught topics of the subject (maximum one page/subject)

The goal of the subject is teaching of non-infectious diseases of the various organs and organ systems of house mammals (ruminants, horses, swine, dogs, and cats) . Etiology and pathogenesis of these diseases are discussed in details as well as diagnosis, treatment and prevention . . The subject includes both theoretical and practical education . The goal of the practical lessons of internal medicine is to practice diagnostic and therapeutic methods .

INTERNAL MEDICINE 1

Topics of the lectures: Internal diseases of dogs and cats . Part 1

Diseases of the respiratory system. Clinical aspects of shock and cardiac insufficiency. Cardiac diseases . Diseases of the digestive system . Diseases of the peritoneum and the pancreas . Liver diseases . Disorders of the hemopoietic organs .

INTERNAL MEDICINE 2

Topics of the lectures: Internal diseases of large animals .

Internal diseases of swine . Internal diseases of ruminants . Internal diseases of horses .

INTERNAL MEDICINE 3

Topics of the lectures: Internal diseases of dogs and cats . Part 2

Endocrine diseases . Metabolic disorders, diseases of the locomotion system . Diseases of the nervous system . Acute and chronic renal failure, diseases of the urinary system . Skin diseases .

SUGGESTED LITERATURE

Nelson, C .R ., Couto, G . (2013): Small Animal Internal Medicine . 5th ed . Mosby; St . Luis . Radostits, O.M., Gay, C.C., Hinchliff, K., Constable, P.D. (2006): Veterinary Medicine. A textbook of the diseases of cattle, horses, sheep, pigs and goats . 10th . ed ., Elsevier Publisher .

Willemsse, T .(1992): Clinical dermatology of dogs and cats . Lea and Febiger .

Lecture notes in the folder available for students on the web site of the Department .

Subject:	Internal Medicine 3 .
Specialization:	Veterinary Science
Term of the subject:	9 .
Number of lectures/semester practicals/semester	36 lectures
Credit:	6
Prerequisites:	
Name of Department:	Department and Clinic of Internal Medicine
Responsible teacher (email):	Dr . Vörös Károly (voros .karoly@aotk .szie .hu)
Teacher(s) take part in teaching:	Lectures: Kutasi Orsolya, Máthé Ákos, Abonyi Tamás, Vörös Károly, Sterczer Ágnes, Psáder Roland, Pápa Kinga, Keresztes Mónika, Manczur Ferenc, Tarpataki Noémi, Vajdovich Péter, Kómár Gyula
Aim of subject:	The goal of the subject is teaching of non-infectious diseases of the various organs and organ systems of house mammals (ruminants, horses, swine, dogs, and cats) . Etiology and pathogenesis of these diseases are discussed in details as well as diagnosis, treatment and prevention . The subject includes both theoretical and practical education . The goal of the practical lessons of internal medicine is to practice diagnostic and therapeutic methods .
Weekly schedule of lectures	
1 .	Urinary diseases . Acute renal failure

	Chronic renal failure . Diseases of dogs and cats I .
2 .	Diseases of dogs and cats II .
	Diseases of dogs and cats III .
3 .	Metabolic and locomotion diseases of dogs and cats I .
	Plenary lecture: Ultrasonography and endoscopy of horses
4 .	Metabolic and locomotion diseases of dogs and cats II .

	Diseases of the canine and feline nervous system Congenital, disorders. Inflammatory diseases I.
5 .	Inflammatory diseases II. Metabolic and toxic diseases I.
	Metabolic and toxic diseases II .
6 .	Physical and neoplastic disorders
7 .	Plenary lecture: Endoscopy of the respiratory and alimentary tract in dogs and cats .
	Epilepsy . Seizures of extracerebral origin
8 .	Plenary lecture: Abdominal ultrasonography of dogs and cats .
9 .	Spinal cord diseases .
	Nincs előadás
10 .	Plenary lecture: Echocardiography of dogs and cats .
11 .	Endocrine diseases of dogs and cats I .
	Endocrine diseases of dogs and cats II .
12 .	Endocrine diseases of dogs and cats III .
	Endocrine diseases of dogs and cats IV . Diseases of the skin of dogs and cats I .
13 .	No lecture
	Diseases of the skin of dogs and cats II .
14 .	Diseases of the skin of dogs and cats III
	Diseases of the skin of dogs and cats IV .
15 .	No lecture

No lecture
Recommended literature
<p>Obligatory: Nelson, C .R ., Couto, G . (2008): Small Animal Internal Medicine . 4th ed . Mosby; St . Luis . ISBN: 978-0-323-04881-1 . Radostits, O.M., Gay, C.C., Hinchliff, K., Constable, P.D. (2006): Veterinary Medicine. A textbook of the diseases of cattle, horses, sheep, pigs and goats . 10th . ed ., Elsevier Publisher . Willemse, T .(1992): Clinical dermatology of dogs and cats . Lea and Febiger . Lecture notes in the folder available for students on the web site of the Department .</p>
Recommended:
Type and method of exam: FE(= final exam)
Note(s):

OBSTETRICS 3, 2017 FALL

Program of Lectures for the English Course 9th Semester: Andrology, Artificial Insemination and Other Techniques of Assisted Reproduction

MONDAYS from 13:15 in the “Hetzel Henrik auditorium”

1 .	11, Sept .	Embryo transfer I . History and practical application of biotechnology in animal reproduction . (Importance, principles . Multiple ovulation) (Solti, L .)
2 .	18, Sept .	Embryo transfer II . Basic principle of Embryo freezing . (Cseh, S .)
3 .	25, Sept .	Embryo transfer III. (Embryo recovery in different species. The morphological evaluation of recovered embryo) (Solti, L .)
4 .	2, Oct .	Embryo transfer IV . (Surgical and non-surgical methods for transfer of embryos in cattle and other species) . (Solti, L .)
5 .	9, Oct .	Embryo transfer V . (micromanipulation of embryos) (Solti L .)
6 .	16, Oct .	Principles of further advanced techniques in reproductive biotechnology . (sexdetermination; production of sex-sorted semen; cloning; gene manipulation techniques; production of transgenic animals) (Solti L .)
23 October – Holiday		
7 .	30, Oct .	Structure of the male reproductive organs . Neuroendocrine regulation of the male reproduction . Endocrine and exocrine function of the testicles . Thermoregulation of the testis . (Cseh S .)
8 .	6, Nov .	Physiology and pathology of epididymis and accessory sexual glands . (Cseh, S .)
9 .	13, Nov .	Artificial insemination. I. (cattle). Semen collection, cryopreservation. (Cseh S.)

10	20, Nov	Artificial insemination II. (pig, small ruminants) (Cseh, S.)
11	27, Nov	Artificial insemination III. (rabbit, horse) (Cseh, S.)
12	4, Dec	Artificial insemination IV. (dog and cat) (Cseh, S.)
13	11, Dec	Infertility in males . The contagious epididymiditis and orchitis of rams . (Cseh, S .)

Mid-term examinations: not intended during the 9th semester .

Preparation of the Diploma thesis

For those students who prepare their diploma thesis at the Department of Obstetrics and Reproduction we warmly recommend to read carefully the information material provided by the Central Library of the Faculty (<http://www.konyvtar.univet.hu/index.php/en/education/guide-to-thesis>) **The**

order of duty at the Small Animal Reproduction Clinic:

- 1 . No more than five students have permission to participate in clinical work in examination room and/or operation room of reproduction clinic simultaneously. The order is first one first serve except the students on obligatory duty . Students have to wear a clean white cloth or any type of surgeon's cloth which haven't been used at clinic of infective patients, and at the Pathology Department .
- 2 . In the operation room the use of operation cap, mask, and plastic foot-muff (all arranged by the students oneself) is obligatory .
- 3 . The touch, feed, drink and take for a walk of the hospitalised patients is forbidden except by the agreement of the doctor of duty at the Reproduction Clinic .

Large animal practicals held in Üllő:

Trainers/clinicians of the farm animal clinic Üllő ask you to bring forceps, needle-holder, scalpel and scissors with yourself to the practicals .

Budapest, 6 September 2017

Prof. Sandor Cseh *chair of department*

OPHTHALMOLOGY

5th year – 1st semester

Lectures		
September 12	Ocular pharmacology	Dr . Szentgáli
September 19	Basic diagnostic procedures	Dr . Szentgáli
September 26	The eyelids I .	Dr . Szentgáli
October 3	The eyelids II .	Dr . Szentgáli
October 10	The conjunctiva	Dr . Szentgáli
October 17	The third eyelid	Dr . Szentgáli
October 24	The cornea I .	Dr . Szentgáli
October 31	The cornea II .	Dr . Szentgáli
November 7	The cornea III .	Dr . Szentgáli
November 14	The lacrymal system	Dr . Szentgáli
November 21	The uvea	Dr . Makra
November 28	Specific ocular conditions in horses	Dr . Makra
December 5	The lens	Dr . Szentgáli
December 12	The Glaucoma	Dr . Szentgáli
Practical training course / small animal ophthalmology		
Sept 27, Oct 4	Examination of the eye I.	Dr . Szentgáli
Oct 11, Oct 18	Examination of the eye II .	Dr . Szentgáli

Dates of Practicals (on Tuesdays):**Group 1-2-3-4:** Sept 27, Oct 11**Group 5-6-7-8:** Oct 4, 18

*The first date belongs to Group 1-4 and the second date means Group 5-8, according to the following timetable:

8 .00 – 10 .15 : **Group 1-2 or 5-6**10 .15 – 12 .30 : **Group 3-4 or 7-8 12**

STATE VETERINARY MEDICINE

Last change: 14 .09 .2017 09:37

Course	State Veterinary Medicine
Language	English
Nature	mandatory
Method of evaluation	signature
Year/semester	5/1
Credits	0
Lectures	30 lessons/semester
Practical lessons	0 lessons/semester

Specialization	veterinary (English)
Department	Department of Veterinary Forensics, Law and Economics

Description

Place of the lectures: Zlamál lecture hall

Time of the lectures: Monday, 11 .15-13 .00

Responsible lecturer: Dr . Csintalan Csaba

Number of lectures: 30 lectures

Preliminaries of the signature: attendance of the lectures, passing the mid-term examinations

Short presentation of the subject: During the lectures the animal health and welfare legislation relating to the veterinary profession and the general and specific preventive and control measures of infectious diseases are presented. This up-to-date knowledge is essential not only for official veterinarians but for every veterinary practitioners working in any field of the profession.

Subject of lectures in detail	
11 Sept	Main aims and objectives of the subject; World Organization for Animal Health (OIE)
18 Sept	FAO, WHO, WTO, OECD, Council of Europe
25 Sept	European Union (institutions, legislation)
2 Oct	Fields of veterinary legislation, Structure and duties of state veterinary services Veterinary checks and certifications, Veterinary medicinal products
9 Oct	Notification of animal diseases Measures for the control of notifiable animal diseases
16 Oct	Veterinary legislation on animal keeping
30 Oct	Midterm examination I . Animal welfare rules of the European Union
6 Nov	Veterinary legislation on the transport of animals and animal products Veterinary legislation on the killing of animals

13 Nov	Disposal of carcasses and animal waste Disinfection
20 Nov	Animal fairs, markets and exhibitions Identification and registration of animals
27 Nov	Midterm examination II . Control strategies against infectious diseases
4 Nov	Veterinary laboratories; diagnostic tests Veterinary public health, Zoonoses control
11 Dec	Midterm examination retake Summary, Consultation

5.5TH YEAR

SAMPLE

11TH SEMESTER LTK PRACTICAL AT THE DEPARTMENT 4 WEEKS

To be present: follow the schedule given by the responsible college from the Equine Department
Obligatory for everyone, starts every day at 8:15

- every day: clinical round
- every Thursday: radiological round next to the secretary - upstairs
- every Friday: Journal Club same location as the radiological round

Working dress: prescribed working cloths, stethoscope, thermometer, scissor, pen

WORKING SCHEDULE:

Own patients will be given, must be followed during their stay . 11th semester students must help in organizing daily work of students coming out for one week practical . 11th semester students must write daily reports into the DokiforVets patient program. On clinical rounds in the afternoon they should present their cases . They have no duty and no right to communicate with the owners . It is the duty of the vet responsible for the patient .

During the practical students should fulfil all of the cases listed on clinical cards for equine patients.

On Journal Clubs they must participate actively . They should give their email address to the vet responsible for the JC in order to receive the papers before the JC .

11th semester students must pick up, prepare a ppt from it and present a case at the end of their practical (10-15 minutes) .

If there are serious problems rising during the practical with a 11th semester student (not present on obligatory events, often late), it must be discussed within the first 2 weeks with a senior lecturer from the clinic . If problems are not solved, the practical for this student will not be accepted .

Students having their practical on outside locations must sit a practical exam at the end of their practical in the Equine Department . The exam is organized in a written form by the Equine Department .

REQUIREMENTS FOR THE 11TH SEMESTER AT THE DEPARTMENT FOR EXOTIC ANIMAL AND WILDLIFE MEDICINE

Students will be spending 4 weeks at the Department for Exotic Animal and Wildlife Medicine in the 11th semester, in which 4 weeks they will acquire skills in diagnosing, diseases, therapy and prevention in exotic and wildlife medicine .

On the first day all students will have to participate in an obligatory short briefing about safety, about fire prevention and what to do in case of accidents. A syllabus and the assignments will also be handed out at that time .

Pathology, animal health, clinical diagnostics and therapy will be scheduled topics of the four weeks, where every topic will be introduced with a short lecture, and daily obligatory consultations will be held . Every student has to take part in the daily treatment of patients as well . At least one full protocol of a patient should be followed through from admission until discharge . Dr . János Gál is responsible for the protocols and the students .

Topic	Lecturer	Lecture	Practical	Exam
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Pathology of Exotic Birds	Dr . János Gál	3 hours	3 days	oral exam
Veterinary Treatment of Exotic and Wild Bird Stocks	Dr . János Gál	3 hours	1 day	oral exam
Clinical Tests on Exotic Animals (bloodworks)	Dr . Mózer Anikó	3 hours	4 days	oral exam
Exotic Animal Dentistry	Dr . Antal Papp	3 hours	2 days	oral exam
Radiology and Diagnostics in Exotic Animals	Dr . János Gál / Dr. Vad Ákos	3 hours	2 days	oral exam
Anaesthesia in Exotics	Dr . Anna Linda Nógrádi	3 hours	2 days	written exam
Surgical Procedures in Exotic Animals	Dr . Antal Papp	3 hours	2 days	oral exam

The lecturers might assign literature in Hungarian and in English apart from the lecture notes for the exam. To fulfil requirements students must successfully complete the exams in all 7 topics. In case of a failed exam, students have 2 more possibilities to retake it . At the end of the practical period, the student will also get a grade for the clinical activity given by the clinical veterinarians . The average of all the grades will be the end grade what the student will get at the end of the practical .

If a student misses a topic because of medical reasons the student can finish the topic in the next cycle if medical papers are presented . In case of a special reason a student can miss a day even without any medical papers, which is allowed by the head of the department . In this case a test has to be taken in the missed topic .

Dr. János Gál
Head of Department

HERD-HEALTH PRACTICAL IN DAIRY CATTLE FARM

Undersigned, Supervisor of the practical work, herewith declares that the practitioner duly performed the tasks assigned for the date

	Tasks	Date	Signature
1	General overview of the farm . Geographical direction of the farm, distance between the farm and nearest human settlements . Comparison of animal welfare and biosecurity specifications to actual parameters of the farm . Description of the housing and feeding technology .		
2	Summary and analysis of the main data of the farm . Getting acquainted with herd management software applied in the farm: data recording, verification of records, analyse herd performance with regard to production, reproduction and health, identify cows that are not performing, track and report of financial aspects etc.		
3	Visual examination of the daily feed ration and drinking water; taking water and feed samples for laboratory analysis; evaluation of previous laboratory reports .		
4	Getting acquainted with the practice of feeding applied in the farm .		
5	Body condition scoring, visual examination and scoring of faeces . Observation and examination of rumination .		

6	Presence, observation and active assistance to labouring cows, taking care of new-born calves, in case: resuscitation . Active gynaecological involvement in cases of dystocia . Critical evaluation of hygienic aspects of calving .		
7	Hysterotomia (section Caesarea) .		
8	Check-up of involution and complications (retained foetal membranes, puerperal and clinical metritis, pyometra) . Setting diagnosis and purposeful treatment .		
9	Verifying the cyclic activity of ovaries, examination of ovaries and appendances by rectal palpation and ultrasonic equipment .		
10	Oestrus detection. Artificial insemination. Diagnostic and inductive methods of stimulating ovarian activity as used in the farm .		
11	Pregnancy diagnosis with cows and in-calf heifers . Rectal examination on days 42-60 after servicing.		
12	Pregnancy diagnosis with cows and in-calf heifers with echography from day 30 onward after servicing.		
13	Treatment of the new-born calf (freeing the upper airways, disinfection of the umbilical cord /navel disinfection/, supplementation with colostrum etc .)		
14	Checking-up the quality of colostrum and supplementation of calves with colostrum .		
15	Dissection of superfluous nipples and dehorning.		
16	Clinical examination of calves and growing cattle, diagnosis of diseases present in the farm and treatments .		
17	Active participation in preventive programmes (immunisation, antiparasitic treatments etc .) .		
18	Getting acquainted with technics of milking, qualification of the milking procedure. Evaluation of profilactic measures.		
19	Diagnosis and treatment of clinical mastitis .		

20	Diagnosis and treatment of sub-clinical mastitis, acquirement of methods applied at the farm (e.g.:CMT).		
21	Taking milk samples from the mammary gland for microbiological examination . Evaluation of data reported by the diagnostic lab .		
22	Review and critical analysis of the mastitis control programme used in the farm .		
23	On spot treatment of raw milk, the operation of the milk-house .		
24	Knowing and critical analysis of the farm practice of preventive foot bathing .		
25	Functional hoof trimming, curative trimming of diseased claws and medical treatments .		
26	Detailed clinical examination of diseased animals, diagnosis and treatment . Description of the cases .		
27	Withdrawing biological samples (blood, urine, rumen content and milk) and obtaining hair samples .		
28	Justification of implementing metabolic profile tests and critical evaluation of data reported by the diagnostic lab .		
29	On spot diagnostic tests (test stripes for the examination of urine samples; tests for rumen fluid samples, etc.).		
30	On spot surgical interventions (trocarisation /paracentesis/ of the rumen, treatment of wounds, surgical solution of abomasal displacement, etc .) .		
31	Participation in herd-level treatments (antiparasitic treatments, immunisations, etc .) .		
32	Carrying-out tuberculin skin test and evaluation of results .		
33	Involvement in implementation of timely state veterinary actions . Critical analysis of waste management and disposal applied in the farm .		
35	Autopsy and dissection of carcasses . Sending dead animals (or parts) into diagnostic laboratories . Preparation of documentations .		
36	Overall summary and evaluation of the farm with special regard to economy of production, housing and feeding conditions and to the herd health technology .		

Of the above practices the student should perform at least 60% and the activities should be testified by signature of the supervisor . Lesser performance forms stumbling block of acceptance .

Date and place of the practice

.....

Supervisor

Issued by the Department of Animal Hygiene,
Herd-Health and Veterinary Ethology

Budapest, 28th of February 2018

Prof . Dr . habil Endre Brydl, DVM, CSc, R . Dipl

ECBHM

Professor Emeritus

University of Veterinary Medicine Department of
Animal Hygiene, Herd Health and Veterinary
Ethology H-1078 Budapest, István u . 2 . brydl
.endre@univet .hu +36-1-478-4100/8516, +36-20-
925-2127

PRACTICAL IN FISH FARMING

Undersigned, Supervisor of the practical work, herewith declares that the practitioner duly performed the tasks assigned for the date

	Tasks	Date	Signature
1	Structure of the fishpond(s) and the fish farming enterprise. Aqua-systems, water protection and care . Pond and facility construction .		
2	Water sampling; packing and transport of water samples and transport of fishes to diagnostic laboratories.		
3	Sampling technology for notifiable diseases. Routine anatomical-pathological dissection of fishes.		
4	Examination of fishes for the presence of ectoparasites and dermal microbes .		
5	Microscopic examination of gill for presence of parasites, moulds and bacteria .		
6	Examination of the internal organ of fishes for recognising characteristic symptoms; sampling specimens for histological examination .		
7	Natural and artificial propagation, breeding through hypophysation, ripening of eggs, breed selection .		
8	Initial larval rearing, feeding; technological failures (if any) .		
9	Displacement of larvae, population of ponds according to kind of ponds and fish breeds.		
10	Growing-finishing of market fish; environmental influences (effect of bird predators) .		
11	Feeding technology in aquacultures, available feeds and emerging problems .		
12	Reasons of chemical examination of fish pond waters, frequency and distribution according to pond type in one breeding season .		
13	Examination of living plankton (determination of algae and low order animals) .		
14	Most frequent medical treatment in fish farming: calcification, treatment with calcium hypochlorite etc .; reasons and practical implementation .		
15	Methods and equipment of harvest, preparation for fish transport, liabilities of state veterinary medicine at transportation and at sale .		
16	Reasons and methods of fish transport (sale at markets, relocation, export, breeding replacement, diagnostic procedures, etc .) .		
17	Treatment and disposal of fish masses lost due to infectious diseases or environmental catastrophes .		
18	Methods and implementation of medical treatments against special fish diseases in different types of aquacultures. Reasons and practice of use of bath in medicated water .		

19	Diseases caused by ciliates and flagellates: seasonality, affected age groups and species .		
20	Diseases caused by Dactylogyrus sp.: seasonality, affected age groups and species .		
21	Connection between nature conservation and fish farming, effects on economy of fish production.		
22	Prevention of economic losses by rural conservation compatible methods .		
23	Economic evaluation of the fish production enterprise; criteria of sustainable production with regard to protection of the environment .		

Of the above practices the student should perform at least 60% and the activities should be testified by signature of the supervisor . Lesser performance forms stumbling block of acceptance .

Date and place of the practice

.....
Supervisor

Issued by the Department of Animal Hygiene,
Herd-Health and Veterinary Ethology

Budapest, 28th of February 2018

Prof . Dr . habil Endre Brydl, DVM, CSc, R . Dipl . ECBHM
Professor Emeritus
University of Veterinary Medicine
Department of Animal Hygiene, Herd Health and Veterinary Ethology H-1078
Budapest, István u . 2 .
brydl .endre@univet .hu
+36-1-478-4100/8516, +36-20-925-2127

HERD-HEALTH PRACTICAL IN PIG FARM

Undersigned, Supervisor of the practical work, herewith declares that the practitioner duly performed the tasks assigned for the date

	Tasks	Date	Signature
1	Comparison of animal welfare and biosecurity specifications with actual parameters of the farm		
2	Critical evaluation of biosecurity facilities and their operation . Experiences with implementation of the “all in – all out” principle .		
3	Studying the farm by checklists with special reference to discussing principal items of operation, management, health, population genetics and nutrition .		
4	Evaluation of methods of disinfection as applied in the farm . Checking the efficiency of disinfection.		

5	Waste management I . Treatment and disposal of carrions in the farm; critical analysis in the mirror of the existent regulations .		
6	Waste management II . Description and critical analysis of (liquid and/ or solid) manure treatment and disposal .		
7	Methods of pest control in the farm (rodent-, bird- and insect-control) .		
8	Description and critical evaluation of the operation of heating and ventilation systems. Instrumental control of the efficiency of air exchange in one or two chosen building(s) by using environmental diagnostic techniques .		
9	Management practices applied in the farm to reduce expensive feed wastages including feed distribution system and storage; feeder setup and management; feeding and management; rodent and vermin control; feeding unnecessary animals; feeding for unnecessary activity . Farm practice of water management: sampling of water source(es); correspondence with the diagnostic lab; evaluation of former data of water analysis; clearing and disinfection of the local water resource(s) .		
10	Discussion of fattening performance (actual parameters of FCR /feed conversion rate/, daily weight gain, age at slaughter /105kg/) preferably with the veterinary consultant of the farm . Overview and detailed discussion on the effects of actual health status of the farm, nutrition and genetic program applied locally .		
11	Local practice of animal transportation . Critical evaluation of the practice with respect to the relevant animal welfare codes and directives .		
12	Getting acquaintance with the local computer programmes to support feeding, breeding and animal health management with special reference to multi-factorial approach to controlling diseases (e .g . porcine respiratory disease complex) .		
13	Evaluation of reproductive performance of the farm . Collating the actual parameters with the target and boundary (decision) parameters . Location of problem area(s) .		
14	Practicing oestrus detection, oestrus synchronisation; AI and early pregnancy check .		

15	Local practice of buying in replacement animals . Conditions and practical conduct of quarantining . Principles and implementation of raising gilts with reference to animal health aspects . Methods of selection of gilts for breeding . Proportion of failure and silent gilts . Possible reason(s) .		
16	Animal health and breeding management of boars . Practicing of semen collection . Microscopic evaluation of semen samples .		
17	Animal health and breeding management of primi- and multiparous sows with special reference to vaccination programmes and antiparasitic treatments .		

18	Reasons and economic consequences of culling of gilts and sows (culling strategy; proportion of voluntary and involuntary removals; effects of pre- and post-service and removal intervals on the culling rate) .		
19	Herd-health management from farrowing till weaning: Theory and practices of synchronised farrowing; hormonal interventions during and after farrowing; Assistance at farrowings; resuscitation; Analysis late foetal death and intrapartum/early postnatal death (occurrence, proportions) Risk analysis of producing stillborn piglets; Theory and local practice of fostering; Postnatal preventive treatments of new-born piglets .		
20	Periparturient disease complex of the sow with special reference to occurrence, herd-level diagnosis, prevention and treatment of hypogalactia . Teat profiles (inspecting and recording of at least 50 sows); Practicing body condition score of sows (investigation of at least 50 sows; distribution of scores and optionally photo-illustration of different body conditions); The role of feeding, housing and way of relocation of sows from the in-pig sow house to the farrowing house on the development of the periparturient disease complex .		
21	Her-health management from farrowing till weaning Check-up abortions and application of relevant measures of state veterinary medicine; Rules and practice of sending samples to diagnostic lab; Reasons and magnitude of stillbirths Supervision of farrowing as mean of controlling stillborn losses; By inspecting and taking weight of new-born piglets of at least 20 litters prepare statistics on birth weight distribution of piglets; Prepare statistics on the reasons and proportion of infectious and noninfectious losses between farrowing and weaning .		
22	Herd-health management from weaning to the end of the nursing (postweaning) period Local factors that affect weight gain after weaning (preferably on basis of measuring the weight gain); Create statistics on bacterial and viral diseases that characterise the farm; Ideal and local practice of prevention of periweaning enteral diseases .		
23	Herd-health management of the fattening pig; If present: study the control methods postweaning multysystemic wasting syndrome .		
24	With supervision of the local vet and with active collaboration of the vet-assistant participation in the daily routine of the preventive and curative work (herd inspection, autopsy, immunisation, antiparasitic treatments etc .) .		
25	With supervision of the local vet and with active collaboration of the vet-assistant participation in the daily routine of the preventive and curative work: castration, hernia repairs etc .		

26	Diagnostic work: collecting biological samples and submitting them with leg artis letter to diagnostic labs; Individual and mass-treatments (e .g . application of medicine(s) in drinking water) .		
27	Purchase of medicines, vaccines, veterinary biologicals and instruments; Critical evaluation of storing conditions of the above material .		
28	Summary and discussion of the vaccination and curative programmes applied in the farm; refreshment of knowledge of relevant infectious and germ related multi-factorial diseases .		
29	Pre-transport inspection of animals, filling up appropriate documentations .		
30	Practicing slaughterhouse surveillance according to the relevant lecture (occurrence, prevalence and severity /scoring/ of respiratory disorders / including pleurisy, lung abscessation and atrophic rhinitis/; ascariasis; nephritis and sarcoptic mange) in the slaughterhouse to where the finished pigs are transported on regular basis.		
31	Overall summary and evaluation of the farm with special regard to economy of production, housing and feeding conditions and to the herd health technology.		

Of the above practices the student should perform at least 60% and the activities should be testified by signature of the supervisor . Lesser performance forms stumbling block of acceptance .

Date and place of the practice

.....
Supervisor

Issued by the Department of Animal Hygiene,
Herd-Health and Veterinary Ethology Budapest, 28th

of February 2018

Prof . Dr . habil Endre Brydl, DVM, CSc, R . Dipl . ECBHM

Professor Emeritus

University of Veterinary Medicine

Deaprtment of Animal Hygiene, Herd Health and Veterinary Ethology H-1078

Budapest, István u . 2 .

brydl .endre@univet .hu

+36-1-478-4100/8516, +36-20-925-2127

PRACTICAL IN SHEEP FARMING

Undersigned, Supervisor of the practical work, herewith declares that the practitioner duly performed the tasks assigned for the date

	Tasks	Date	Signature
1	Overview and general evaluation of the farm . Geographical orientation of the farm, distance to nearest settlements . Biosecurity of the farm . Getting acquainted with the housing technology . Characteristics of the sheep breed kept/bred at the farm .		
2	Recording and processing of data and information parameters by the computer software used at the farm with special reference to data of production, prolificacy and herd-health.		
3	Examination of feed rations and drinking water; sampling of feeds and drinking water; critical evaluation of data of laboratory analysis .		
4	Feeding practice of the sheep farm . Actions before the grazing season .		
5	Scoring of body condition; examination of the faeces and rumination .		
6	Reproduction management in breeding flocks. (Is any assisted reproductive intervention available? e .g .: AI, oestrus synchronisation, induced lambing etc .)		
7	Presence and observation of lambing; hygiene of lambing; in case: gynaecological assistance .		
8	Ultrasonic preg-check . Other methods of pregnancy checking as used at the farm .		
9	Source of income of the sheep farm: broiler lamb production; milking and on the spot milk treatment .		
10	Diagnosis of lambs' management related diseases . Methods of prevention and control .		
11	Active involvement in medical treatments (restriction of sheep for individual treatments; blood sampling, vaccination, claw trimming and treatments etc .) . Flock treatment protocols .		
12	Observation and involvement in timely state veterinary interventions . Practice of sheep transportation, disposal and treatment of waste materials .		
13	Diagnostic examination at flock level; sheep transport to slaughterhouse, to other countries; filling up veterinary documentations for transport.		
14	Postmortem examinations; sending dead animals or part(s) of dead animals to diagnostic laboratory; evaluation of laboratory reports .		
15	Critical summary of the management and conduct of the farm with special regard to economy of production, housing, feeding and veterinary technology .		

Of the above practices the student should perform at least 60% and the activities should be testified by signature of the supervisor . Lesser performance forms stumbling block of acceptance .

Date and place of the practice

.....
Supervisor

Issued by the Department of Animal Hygiene,
Herd-Health and Veterinary Ethology

Budapest, 28th of February 2018

Prof . Dr . habil Endre Brydl, DVM, CSc, R . Dipl . ECBHM

Professor Emeritus

University of Veterinary Medicine

Deaprtment of Animal Hygiene, Herd Health and Veterinary Ethology H-1078

Budapest, István u . 2 .

brydl .endre@univet .hu

+36-1-478-4100/8516, +36-20-925-2127

SAMPLE

11TH SEMESTER EXTRAMURAL FOOD HYGIENE PRACTICAL

Last change: 28 .03 .2018 13:51

Course	11 th semester extramural food hygiene practical
Language	English
Nature	mandatory
Method of evaluation	semi-final examination
Year/semester	6/1
Credits	3
Lectures	0 lessons/semester
Practical lessons	80 lessons/semester
Specialization	veterinary (English)
Department	Department of Food Hygiene

DESCRIPTION

The practical can be executed in Hungary or in another Country . The duration of the combined food hygiene and state veterinary medicine practice is four weeks .

Extramural training on Food Hygiene/Public Health in Hungary is organized in co-operation with the national food-chain control authority (National Food Chain Safety Office).

Each training facility involved in the obligatory extramural programme in Hungary has been accredited by the Department of Food Hygiene. The training is supervised by the official veterinarian responsible for the establishments where the training takes place and also controlled by members of the Department of Food Hygiene .

Tasks to be executed are the followings (both in Hungary and other Country)

	Task
1 .	Meat inspection at slaughterhouse/game slaughter establishment
	1 .1 . Swine and/or cattle
	1 .2 . Poultry and/or rabbit and/or game
2 .	Food safety control of a site of primary production (farm)
3 .	Registration and approval of a food production plant
4 .	Control of a registered/approved food production establishment
5 .	Control of the transport and wholesale storage of foodstuffs
6 .	Control of the retail marketing of foodstuffs
7 .	Control of catering establishments
8 .	Control of small-scale food production, processing and marketing

1. The fulfillment of point 1 is obligatory according to the following schedule. The respective training period is at least one week, out of which minimum 3 days must be accomplished in a pig and/or cattle slaughterhouse .
- 2 . Tasks indicated under points 2-8 . are selectable such a way that at least 70% of the tasks (altogether 5 tasks) should be covered .

DIARY, CERTIFICATION, EXAM, PRACTICAL MARK (both in Hungary and other Country)

During the practical, a report (“work log”) should be prepared, indicating the daily main activity/ activities (see below) .

The conductor of the practice on site, will issue a written certificate on fulfilment of the practice.

An approximately 20-30 pages typed report must be prepared critically describing the student’s activity, observations, critical evaluations including for example a virtual potential inspection/audit on the establishment/operation/process control . The supervisor veterinarian should evaluate this written work in some sentences and should sign it .

The diary latest until 12 .00 p .m . (12 noon) of before-day of the exam should be upload to the following link: <http://www.vetphysiol.hu/zarovizsga/> .

After finishing the practice and having uploaded the diary including the above-mentioned certificate, the student will make an oral exam on her/his activities presented on some slides (power point presentation) in maximum 5 minute at the Department of Food Hygiene .

The time of this exam following a discussed and mutually accepted day with the Department is at the end of each training block or during the creative period after the end of the training period.

FARM ANIMAL PRACTICAL IN THE 11TH SEMESTER 2018/2019

The farm animal practical is obligatory for all those students who had passed all obligatory exams during the 10 semesters of veterinary education in our school . The farm animal practical cannot be exchanged with other clinical practical e .g . horse, pet/exotic or extramural clinical practical guided by one of the departments of the Faculty .

GENERAL INFORMATION:

From 2014 the duration of clinical practical is 12 weeks . Of these 12 weeks students may devote 4 weeks pet/exotic and 4 weeks horse practical or 8 weeks pet/exotic or 8 weeks horse practical but 4 weeks practical with farm animals is obligatory for all the students . Those students who are especially interested in farm animals they may choose twice 4 weeks farm animal practical and they have to use 4 weeks pet/exotic or horse practical .

DETAILED INFORMATION:

According to the general information written above the **duration of farm animal practical is 4 or twice 4 weeks** .

- Responsible department for farm animal practical is the **Department of Animal hygiene, Herd Health and Veterinary Ethology;**
- General supervisor of the programme: **Dr . Endre Brydl** Professor Emeritus, Dipl . ECBHM
- **Place and local supervisor** of the practice had been carefully selected and **duly accredited by the University of Veterinary Medicine;**

- **The field of activities** of farm animal practical are as following:
- Practice cattle
- Practice pig
- Practice sheep
- Practice poultry
- Practice fish-farming
- **The activities** should be practiced during the practical are listed in the enclosure concerning for each field.
- In case of **mixed 4 weeks practical** (farm animals, pets/exotics, horses) 60% of all the activities listed in all fields have to be performed by the student (e.g. 30% of activities of cattle, 20% of activities of sheep and 10% of activities of pigs) .
- **Report:** preparation of a practical report of about 10-15 pages is requested . Activities should be **briefly summarised day-by-day in a diary form**, written in chronological order . Photos might be used for illustrating the daily activities . These may increase the quality of the report . The size of the photos is additional to the requested minimum 10 pages written text (12 point Time New Roman, pages with 2 .5 margins on top, bottom and sides .)
- Language of the report is English
- The practice has to be officially certified by the local supervisor by his/her **signature on the list of activities and at the end of the diary** as well as **his/her evaluation of the activities of the student needed by suggesting mark between 1-5;**
- The deadline of handing in the **printed version** of the report to the Department of Animal hygiene, Herd Health and Veterinary Ethology is at least **the day of the practical exam** that follows the practical . E-mail version (sent in as early as possible to the address: brydl .endre@univet .hu) is highly appreciated, however, it does not substitute the written version .
- Handing in the **written version of the report is strict precondition of sitting for oral examination in farm animal practice** . Special care will be taken for checking the genuineness (originality) of the reports . Any plagiarism will face the student with all the consequences .
- **The exam** consists of **oral summary of the main experiences obtained** . The presentation should be illustrated with slides and any coherent information on Power Point and should **last for 5-10 and 10-15 minutes** for students that spent 4 or twice 4 weeks for practice, respectively . A short description of the main characteristic of the farm in question is welcomed at the beginning of the presentation . The main part of the narrative should highlight the practical activities and experiences .

Issued by the Department of Animal Hygiene,
Herd-Health and Veterinary Ethology

Budapest, 28th of February 2018

Prof . Dr . habil Endre Brydl, DVM, CSc, R . Dipl . ECBHM
Professor Emeritus
University of Veterinary Medicine
Deaprtment of Animal Hygiene, Herd Health and Veterinary Ethology
H-1078 Budapest
István u . 2 .
brydl .endre@univet .hu

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INFORMATION ON THE LABORATORY DIAGNOSTIC PRACTICAL OF THE 11TH SEMESTER (2017/2018)

The two-week-long laboratory diagnostic practical can be completed at the Veterinary Diagnostic Directorate of the National Food Chain Safety Office in Budapest, in its regional departments (Debrecen, Kaposvár), in certain departments of the faculty (Department and Clinic of Farm Animals, Department of Microbiology and Infectious Diseases, Department of Pathology, Department of Parasitology and Zoology,) or in a veterinary diagnostic laboratory outside Hungary, which is able to cover most of the diagnostic areas mentioned below. The diagnostic institute issues a detailed certificate, which contains the grade suggested by the supervisor.

TOPICS OF THE PRACTICAL

- 1 . Rules of sending samples to laboratory diagnosis, packing, cover letter . Sending samples in the case of notifiable diseases.
- 2 . Post mortem examination of mammals, sampling for further laboratory examinations .
- 3 . Post mortem examination of birds, sampling for further laboratory examinations .
- 4 . Diagnostics of certain important infectious diseases of cattle .
- 5 . Diagnostics of certain important infectious diseases of sheep and goats .
- 6 . Diagnostics of certain important infectious diseases of swine .
- 7 . Diagnostics of certain important infectious diseases of horses .
- 8 . Diagnostics of certain important infectious diseases of dogs and cats .
- 9 . Diagnostics of certain important infectious diseases of poultry .
- 10 . Culture and identification of bacteria.
- 11 . Culture and identification of viruses.
- 12 . Parasitological examinations .
- 13 . The most common serological and immunological examinations used in the diagnostics of infectious diseases .
- 14 . The most common molecular biological examinations used in the diagnostics of infectious diseases .
- 15 . Histopathological examinations of infectious diseases, histopathology of certain notifiable infectious diseases .

FORMAL REQUIREMENTS

The signed certificate has to be brought or sent as registered mail to the Department of Microbiology and Infectious Diseases (Budapest, P .O .Box . 22 . H-1581 .) or by e-mail (Biro .Nikoletta@univet .hu) . In case of using e-mail the hard copy has to be handed at the exam .

EXAMINATION

The practice is closed with an oral examination . The students summarise their experiences gained during the practice in a form of a maximum 10 minute long power point presentation, and answer the questions of the examiner in connection with the practical . The presentation has to include the diagnostic methods seen and done, the diagnostic discussions, which were attended and the cases seen at the practical . If more students are at the same institution at the same time, it is accepted that after the general review each student focuses on different tests, cases or differential diagnosis methods but the presentation has to be a complete summary of the practical. The final mark of the exam is defined by the result of the exam and the evaluation of the supervisor.

The exam of the students having practical at the Veterinary Diagnostic Directorate or at the different departments of the faculty is held on the last day of the practical at the Veterinary Diagnostic Directorate and at the Department of Microbiology and Infectious Diseases, respectively . Students have to sign up using the NEPTUN system . Students having spent their practical abroad are examined after the practical block between 21st January and 3rd February, 2019 . They also have to sign up using the NEPTUN system .

*Prof. László Fodor 14th
January, 2018*

SAMPLE

CERTIFICATE

Name of the institute:

Address of the institute:

Supervisor:

Date of the practical:

Name of the student:

.

Herewith I certify that the abovementioned student fulfilled his/her Laboratory diagnostic practical needed by the University of Veterinary Medicine Budapest . The practical included the next topics (please tick the boxes):

Yes	No	Topic	Signature
<input type="checkbox"/>	<input type="checkbox"/>	Rules of sending samples to laboratory diagnosis, packing, cover letter. Sending samples in the case of notifiable diseases.	
<input type="checkbox"/>	<input type="checkbox"/>	Post mortem examination of mammals, sampling for further laboratory examinations . .	
<input type="checkbox"/>	<input type="checkbox"/>	Post mortem examination of birds, sampling for further laboratory examinations .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of cattle .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of sheep and goats .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of swine .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of horses .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of dogs and cats .	
<input type="checkbox"/>	<input type="checkbox"/>	Diagnostics of certain important infectious diseases of poultry .	
<input type="checkbox"/>	<input type="checkbox"/>	Culture and identification of bacteria.	
<input type="checkbox"/>	<input type="checkbox"/>	Culture and identification of viruses.	
<input type="checkbox"/>	<input type="checkbox"/>	Parasitological examinations .	
<input type="checkbox"/>	<input type="checkbox"/>	The most common serological and immunological examinations used in the diagnostics of infectious diseases .	
<input type="checkbox"/>	<input type="checkbox"/>	The most common molecular biological examinations used in the diagnostics of infectious diseases .	
<input type="checkbox"/>	<input type="checkbox"/>	Histopathological examinations of infectious diseases, histopathology of certain notifiable infectious diseases.	

Evaluation of the student's work:

Note (1-5 scale, 5 is the best, 1 is not sufficient): Evaluation
(text):

Date:

.....
Supervisor

REQUIREMENTS OF SMALL ANIMAL CLINICAL PRACTICE IN THE 11TH TERM

Topics of the internal medicine clinical practice in the 11th term

AMBULATORY CLINICAL ACTIVITIES

- Taking history and communication with the owner
- Safe and human restraint (handling) of animals for the clinical examination as well as for diagnostic procedures
- Physical examination and status praesens
- The basics of the problem-oriented approach: problem list, diagnostic and therapeutic plan
- Writing clinical cards and medical records
- Consultation with the owners on animal husbandry and dietetics
- Vaccination and deworming protocols, implementation of microchips, prescription writing
- Performing euthanasia humanely, its indications

EMERGENCY AND INTENSIVE CARE

- Examination, monitoring and care of critically ill patients
- Fluid therapy
- Cardiopulmonary resuscitation, intubation
- Oxygen therapy

SAMPLING TECHNIQUES

- Taking blood samples, intravenous catheterization
- Cystocentesis (“blind” and ultrasound-guided)
- Fine needle aspiration
- Urethral catheterization

LABORATORY DIAGNOSTICS

- “By the table” examinations: microhematocrit, blood glucose measurement, bleeding and coagulation time, urinalysis with dipstick, • Interpretation of laboratory results

ADDITIONAL DIAGNOSTIC METHODS

- Indications and performing abdominal ultrasonography
- Indications and performing echocardiography
- Indications and performing electrocardiography
- Blood pressure measurement
- Endoscopy

ASPECTS OF THE DIFFERENTIAL DIAGNOSIS AND THERAPY OF THE MOST COMMON INTERNAL DISORDERS

- Differential diagnosis of diarrhoea

- Differential diagnosis of vomitus
- Differential diagnosis and therapy of gastrointestinal diseases
- Therapy of fluid-, electrolyte- and acid-base disturbances
- Differential diagnosis of anemia and coagulopathies; blood transfusion • Differential diagnosis of icterus, therapy of the liver diseases
- Differential diagnosis and therapy of the diseases of the urinary system
- Differential diagnosis of polyuria/polydipsia
- Differential diagnosis of coughing and dyspnea; therapy of the diseases of the respiratory organs
- Therapy of the cardiological patients
- Differential diagnosis and therapy of seizures
- Differential diagnosis of the pruritus and alopecia; therapy of a dermatological patient

CLINICAL CARD FOR STUDENTS IN THE 11TH TERM


Name of the student:

Practical period:








Evaluation at the end of the practice:

AMBULATORY ACTIVITIES:



Intervention		Date	Signature (vet)	Date	Signature (vet)
Blood sampling	☞				
Dermatology consultation (participation)	•				
Drug application i .m . (dog)	☞				
Drug application i .v . (cat)	☞				
Drug application i .v . (dog)	☞				
Drug application p .os, (cat)	☞				
Drug application p .os, (dog)	☞				
Drug application s .c .	☞				
Physical examination	☞				
Prescription	☞				
Rectal digital palpation	☞				
Rectal enaema	•				
Taking body condition score					
Taking the anamnesis	☞				

Vaccination (injection, client education)					
Other intervention:					

HOSPITAL PATIENT CARE (INTENSIVE CARE UNIT)

Intervention		Date	Signature (vet)	Date	Signature (vet)
Blood glucose measurement					
Blood transfusion	•				
Calculation of drug/infusion dosage					
I . v . catheterisation					
Interpretation of acid-base results					
Interpretation of laboratory findings					
Maintaining clinical record					
Making therapeutic plan					
Microhaematocrit examination					
Physical examination					
Urinary catheterisation					
Urine dipsticks examination					
Other intervention:					

DIAGNOSTIC IMAGING UNIT:

Intervention		Date	Signature (vet)	Date	Signature (vet)
Abdominal ultrasonography	•				
Blood pressure measurement					
Cystocentesis					
ECG examination and interpretation	•				
Echocardiography	•				
Other intervention:					

Topics of the surgical clinical practice in the 11th semester**ANAESTHESIOLOGY:**

- pre-anaesthetic examination
- different anaesthesia methods
- setting up different breathing circuits, pre-anaesthesia check-up of anaesthetic machines

- application of different ASA protocols (premedication, induction, maintenance)
- diagnosis and treatment of anaesthesia emergencies
- peri-operative anaesthesia monitoring
- peri-operative analgesia

RADIOLOGY:

- radiation safety
- general aspect of radiology (projections, exposition, development)
- contrast materials and techniques
- analysis of radiographs

GENERAL SURGERY:

- general surgical examination
- emergency patient diagnosis and treatment
- closed and open injuries – diagnosis and treatment
- bandaging

GENERAL OPERATIVE SURGERY:

- surgical instrumentation
- surgical suture materials
- creating surgical wounds and suturing
- Soft tissue surgery:
- basic oncological procedures (biopsies)
- basic abdominal surgery (laparotomy, navigation in the abdomen, closure)

ORTHOPAEDICS:

- lameness diagnostics
- basic procedures in bone and joint surgery

NEUROSURGERY:

- neurologic examination
- basic procedures in neurosurgery

Anaesthesiology	Date	Signature	Date	Signature
Task				
iv . catheterisation				
Preoperative examination				
Premedication and induction				
Endotracheal intubation				
Assembly of anaesthesia equipment				
Intraoperative monitoring of patients				
Postoperative monitoring and treatment of patients				

Soft tissue operating theatre	Date	Signature	Date	Signature
Task				
Draping of surgical site				
Assistance to soft tissue/optho procedures				
Suturing of fascia, subcutis, and skin				
Orthopedic operating theatre	Date	Signature	Date	Signature
Task				
Draping of surgical site				
Assistance to ortho/neuro procedures				
Suturing of fascia, subcutis, and skin				
Bandaging				
Radiology	Date	Signature	Date	Signature
Task				
Anaesthetic procedures in the radiology unit				
Standard positioning of patients				
Assessment of radiographs (rounds)				
Consultations/hospital	Date	Signature	Date	Signature
Task				
General surgical examination				
Ophthalmologic examination				
Orthopaedic examination				
Neurological examination				
Treatment of in-patients				

Name:

Period:

Requirements of small animal reproduction protocols for the 11th semester

Sixty percent of obstetric and reproductive examinations listed below have to be performed at least and students have to participate actively in the interventions .

- 1 . Establishment of optimal time of mating, ovulation diagnosis in dog .
 - a . vaginoscopy
 - b . vaginal cytology (sample taking, stain, validation) c . collection
- 2 . Diagnosis of pyometra, medical and operative treatment in the dog and cat .

- a . vaginal examination b . abdominal ultrasound examination c . estimation of results, differential diagnosis
- 3 . Spaying and castration of dogs and cats (ovariectomy, ovari hysterectomy, castration) a . preparation for operation
b . discussion of anaesthetic possibilities
- 4 . Diagnosis of pregnancy a . abdominal ultrasound examination
b . differential diagnosis
- 5 . Caesarean section a . preparation for operation b . participation in intervention
c . attend of newborns (resuscitation, supply of umbilical cord) 6 . Carrying of parturition; attend of newborns, artificial feeding.
- 7 . Complex therapy of mammary tumours a . diagnosis
b . previous diagnostic examinations, validation of results, establishment of prognosis c . participation in operation d . postoperative treatment
- 8 . Examination of semen; artificial insemination in dogs
- 9 . Diagnosis and treatment of peripartal diseases (retention of placentae, eclampsia puerperalis, mastitis)
- 10 . Diagnosis and treatment of prolapsus vaginae and vaginal tumours a . diagnosis
b . participation in operation

STATE VETERINARY MEDICINE PRACTICE

From 01 of February 2018

GENERAL REQUIREMENTS:

- Supervisor of the practice: District/Divisional Veterinary Officer
- Duration of the practice: 2 weeks
- Form of the report: practical report presenting the completed activities/tasks during the practice (1-2 page per activity/task, altogether cc . 10-15 pages); see the attached table in the Annex; preferably with pictures taken on the spot. Three official decisions about the order of state veterinary measures in disease control and one official record about the inspection of a holding or establishment shall be attached to the report . The exact place and duration of the completed activities shall also be given together with the obtained experiences, impressions . It is emphasised that the student shall not present the daily activities in the report but a short description about the completed activities numbered according to the attached list .
- **The first 3 (obligatory)** activities in the list shall be completed by every students and **4 of the 7 other listed activities/tasks** (chosen freely) as the minimum; it shall be certified by the supervisor/ responsible official veterinarian, indicating the exact place and time
- Language of the report: English
- Certification of the practice: **original** copy with the supervisor's stamp and **official signature**
- Deadline for **students spending the practice abroad** of handing the **printed** report to the Department of Veterinary Forensics, Law and Economics, Dr Csaba Csintalan (Állatorvostudományi Egyetem Törvényszéki Állatorvostani, Jogi és Gazdaságtudományi Tanszék, Budapest, 1078 István utca 2 . L . ep . 3 .em): **14 days** after the end of the practice (not through e-mail!)
- Deadline for the **students spending the practice in Hungary**: the report shall be sent through e-mail to the Department (both to csintalan .csaba@univet .hu and igazgatastan@ .univet .hu) by **12 .00 a .m . (noon) on**

Thursday of the last week and the original printed and officially signed copy shall be brought for the examination on Friday of the last week of the practice

- None of identical reports will be accepted
- The students shall sign for the given examination dates on the Neptun system
- The student can take the state veterinary medicine practice examination from the subject only if he/she successfully completed the practice (deadline; official signature!) and the report is accepted.
- Subjects of the written examination: practical questions relating to the completed activities

The acceptance and the final grade is based on the evaluation of the practice report (form and content) and the state veterinary medicine practice examination .

Budapest, 17.01.2018.

Dr. László Ózsvári
Assoc. Prof., Head of Dep.

Annex

Activities to be completed during the State veterinary medicine practice

Undesigned, as the supervisor of the practice certify that the vet student under my supervision fulfilled the assignments on the date of the signature.

	Activity	Place	Date	Signature
1	Participation in control of transport of live animals: animal health and animal welfare norms (inspection of the vehicle and the live animals, administration)			
2	Participation in veterinary and animal welfare checks of an animal holding, official records			
3	Official veterinary administration (notification of animal disease, order of restrictions, state compensation, individual identification and registration of animals, certificates, dog registration etc .)			
4	Participation in the control of disposal of animal waste (collection, transport or means of disposal)			
5	Participation in the veterinary checks of selling animals, animal fairs, markets and exhibitions			
6	Participation in the checks of feedstuff producing or selling facility, checks of producing and using medicated feedstuffs			
7	Participation in the implementation and control of epidemic control measures (e .g . killing animals in disease control situation, official sample taking , disinfection, obligatory treatment, vaccination)			
8	Participation in the checks of keeping and selling pet animals (breeding stock or shop) or the use of experimental animals (breeding or user establishment); animal health and animal welfare aspects			

9	Participation in the veterinary checks of a breeding male animalkeeping facility or artificial insemination centre or poultry hatchery, fish hatchery, or queen bee nursery			
10	Participation in the checks of production, selling and use of veterinary medicinal products (producer, wholesaler or pharmacy); procurement and administration of products			

Date-----

Stamp and official signature of the supervisor



SAMPLE

SAMPLE