UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
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Register no.:
File no.:
Zagreb, August 9th, 2023.

COURSE SYLLABUS

Course name: GENERAL VETERINARY PATHOLOGY

Academic year 2023-2024

Course leader: Marko Hohšteter, DVM, PhD, Associate Professor

Teachers: Andrea Gudan Kurilj (AGK), DVM, PhD, DECVP, Full Professor; DVM, PhD; Marko Hohšteter (MH), DVM, PhD, Associate Professor; Ivan-Conrado Šoštarić-Zuckermann (ICŠZ), DVM, PhD, DECVP, Associate Professor

Associate teachers: Lidija Medven Zagredišnik (LMZ), DVM, PhD, Assistant; Dunja Vlahović (DV), DVM, PhD, Assistant; Iva Ciprić (IC), DVM, Assistant

First day of classes: 2.10.2023.

Last day of classes: 21.12.2023.

Activities - General Veterinary Pathology (1/4)

Start Dat	Start Tim	End Tim	Subject	Group	Instructor	Room	Length
02/10/202	10:00	10:45	p01 Introduction	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	0:45
02/10/202 3	10:45	11:30	p02 Reversible cell injury	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	0:45
03/10/202	10:00	11:30	p03 Apoptosis	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	1:30
04/10/202	10:00	11:30	p04 Necrosis	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	1:30
04/10/202 3	12:00	15:00	v01 Necropsy technique 1	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
05/10/202 3	10:00	10:45	p05 Chronic cell adaptation	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	0:45
05/10/202 3	10:45	11:30	p06 Circulatory dosorders: general	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	0:45
06/10/202 3	8:15	11:15	v02 Necropsy technique 2	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
09/10/202 3	8:15	9:45	p07 Edema, hyperemia	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	1:30
10/10/202 3	8:15	11:15	v03 Necropsy technique 3	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
13/10/202 3	8:15	9:45	p08 Haemorrhage, thrombosis	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	1:30
16/10/202	10:00	10:45	p09 Infarct, shock	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	0:45

Activities - General Veterinary Pathology (2/4)

Start Dat	Start Tim	End Tim	Subject	Group	Instructor	Room	Length
16/10/2023	10:45	11:30	p10 Acute inflammation - general	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	0:45
18/10/2023	8:15	11:15	v04 Necropsy technique 4	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
23/10/2023	8:15	9:45	p11 Acute inflammation - cellular reaction	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	1:30
26/10/2023	10:00	11:30	p12 Biomediators of inflammation	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	1:30
30/10/2023	8:15	11:15	v05 Necropsy technique 5	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
08/11/2023	8:15	9:00	p13 Classification of inflammation	5E-1, 5E-2, 5E-3	Hohšteter M.	P_patologija	0:45
08/11/2023	9:00	9:45	p14 Chronic inflammatiom - mechanism	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	0:45
13/11/2023	10:00	11:30	p15 Granulomatous inflammation	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	1:30
15/11/2023	10:00	11:30	p16 Hypersensitivity reactions	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_patologija	1:30

Activities - General Veterinary Pathology (3/4)

Start Dat	Start Tim	End Tim	Subject	Group	Instructor	Room	Length
17/11/2023	12:00	15:00	v06 Necropsy technique 6	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
22/11/2023	10:00	10:45	p17 Autoimune diseases	5E-1, 5E-2, 5E-3	Šoštaric Z. I.	P_fiziologija	0:45
22/11/2023	10:45	11:30	p18 Tumors - introduction	5E-1, 5E-2, 5E-3	Gudan K.	P_fiziologija	0:45
23/11/2023	12:00	15:00	v07 Necropsy technique 7	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
27/11/2023	8:10	11:10	v08 Necropsy technique 8	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
28/11/2023	12:00	15:00	v09 Necropsy technique 9	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
30/11/2023	8:15	11:15	v10 Necropsy technique 10	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
04/12/2023	10:00	11:30	p19 Tumors - carcinogenesis	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	1:30
08/12/2023	10:00	11:30	p20 Tumors - immunity, dissemination	5E-1, 5E-2, 5E-3	Gudan K.	P_patologija	1:30
12/12/2023	8:15	11:15	v11 Necropsy technique 11	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00

Activities - General Veterinary Pathology (4/4)

Start Dat	Start Tim	End Tim	Subject	Group	Instructor	Room	Length
14/12/2023	8:15	11:15	v12 Necropsy technique 12	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
18/12/2023	8:15	11:15	v13 Necropsy technique 13	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
19/12/2023	8:15	11:15	v14 Necropsy technique 14	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
21/12/2023	8:15	11:15	v15 Necropsy technique 15	5E-1, 5E-2, 5E-3	Nastavnici na predmetu	S_patologija	3:00
Total: 35							**67:30**

Timetable for LECTURES academic year 2023-2023

LECTURES				
Date	**Methodological unit**	**Teacher**	**Location / time**	**Literature**
3.10.2023.	Introduction to Veterinary Pathology	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/Department of Veterinary Pathology/ 10.00-10.45 h	1. J. F. Zachary: Pathologic Basis of Disease, 6th edition, Elsevier, Philadelphia, 2017. 2. V. Kumar, Abul K. Abbas, N. Fausto: Robbins and Cotran Pathologic Basis of Disease, 9th. Elsevier Saunders, Philadelphia, 2015. 3. D. O. Slauson, Cooper, B. J.: Mechanisms of Disease. 3th edition, Mosby, St. Louis, 2002. 4. Notes and presentations provided by lecturers.
	Reversible cell injury	Assoc. Prof. Marko Hohšteter	Lecture Room/Department of Veterinary Pathology/ 10.45-11.30 h	
3.10.2023.	Cell death: apoptosis	Assoc. Prof. Marko Hohšteter	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	
4.10.2023.	Cell death: necrosis	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	
5.10.2023.	Chronic cell injury and cell adaptations	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Department of Veterinary Pathology/ 10.00-10.45h	
	Circulatory dosorders: general	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/10.45-11.30 h	
9.10.2023.	Circulatory disorders: edema, hyperemia and congestion, hemostasis	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/8.15-9.45 h	
13.10.2023.	Circulatory disorders: haemorrhage, thrombosis, DIK, embolization	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/ 8.15-9.45 h	
16.10.2023.	Circulatory disorders: infarct, shock	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/ 10.00-10.45 h	
	Acute inflammation: general	Assoc. Prof. Marko Hohšteter	Lecture Room/ Department of Veterinary Pathology/ 10.45-	

			11.30 h	
23.10.2023.	Acute inflammation: fluidic and cellular phase, effector cells, phagocytosis	Assoc. Prof. Marko Hohšteter	Lecture Room/ Department of Veterinary Pathology/ 8.15-9.45 h	
26.10.2023.	Acute inflammation: chemical mediators, reparative phase of acute inflammation	Assoc. Prof. Marko Hohšteter	Lecture Room/ Department of Veterinary Pathology/ 10.45-11.30 h	
8.11.2023.	Acute inflammation: morphologic classification of exudates	Assoc. Prof. Marko Hohšteter	Lecture Room/ Pharmacology/ 8.15-9.00 h	
	Chronic inflammation: cellular mechanisms	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Pharmacology/ 9.00-9.45 h	
13.11.2023.	Chronic inflammation: granulomatous inflammation; wound healing and angiogenesis	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	
15.11.2023.	Diseases of immunity: hypersensitivity reactions, amyloidosis	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	
22.11.2023.	Diseases of immunity: general features of autoimmune diseases	Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann	Lecture Room/ Department of Veterinary Pathology/ 10.00-10.45 h	
	Neoplasia: general nomenclature; tumor characteristics; neoplastic transformation	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/ 10.45-11.30 h	
4.12.2023.	Neoplasia: heritable alterations; molecular determinants; mechanisms of carcinogenesis	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	
8.12.2023.	Neoplasia: tumor immunity; tumor dissemination; paraneoplastic syndrome	Prof. Andrea Gudan Kurilj	Lecture Room/ Department of Veterinary Pathology/ 10.00-11.30 h	

Timetable for PRACTICALS academic year 2023-2024

PRACTICALS						
Date	**Methodological unit**	**Teacher**	**Type of practical**	**Group**	**Location / time**	**Literature**
4.10.2023.	Necropsy technique: an introduction	ICŠZ; DV; LMZ	Clinical practicals	1,2,3	Necropsy hall/ 12.00-15.00 h	J. F. Zachary: Pathologic Basis of Disease, 6th edition, Elsevier, Philadelphia, 2017. Grabarević, Željko i Sabočanec, Ruža (ur.): Osnove razudbe domaćih životinja. Medicinska naklada, Zagreb, 2016. Notes provided by lecturers.
6.10.2023.	Necropsy technique: general principles	AGK; IC; DV	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
10.10.2023.	Necropsy technique: the necropsy record	MH; IC; ICŠZ	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
18.10.2023.	Necropsy technique: describing lesions	AGK; MH; LMZ	Clinical practicals	1, 2, 3	Necropsy hall/ 8.15-11.15 h	
30.10.2023.	Necropsy technique: collection and submission of specimens for laboratory examination	AGK; MH; DV	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
17.11.2023.	Necropsy technique: tissue changes – normal anatomical structures and species variation	IC; ICŠZ; LMZ	Clinical practicals	1,2,3	Necropsy hall/ 12.00-15.00 h	
23.11.2023.	Necropsy technique: physiological, senile and agonal changes	MH; DV; IC	Clinical practicals	1,2,3	Necropsy hall/ 12.00-15.00 h	
27.11.2023.	Necropsy technique: post mortem changes	ICŠZ; IC; AGK	Clinical practicals	1,2,3	Necropsy hall/ 8.10-11.10 h	

28.11.2023.	Necropsy technique: dissection and examination stage	DV, IC, LMZ	Clinical practicals	1,2,3	Necropsy hall/ 12.00-15.00 h	
30.11.2023.	Necropsy technique: dissection and examination stage	LMZ; DV; AGK	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
12.12.2023.	Necropsy technique: dissection, examination and recognition of pathological changes	MH; ICŠZ; IC	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
14.12.2023.	Necropsy technique: dissection, examination and recognition of pathological changes	DV; LMZ; AGK	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
18.12.2023.	Necropsy technique: dissection, examination and recognition of pathological changes	ICŠZ; LMZ; IC	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
19.12.2023.	Necropsy technique: dissection, examination and recognition of pathological changes	AGK; MH; DV	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	
21.12.2023.	Colloquium	ICŠZ; MH; LMZ	Clinical practicals	1,2,3	Necropsy hall/ 8.15-11.15 h	

STUDENT OBLIGATIONS

Lecture attendance	The total number of lectures include 30 hours. During fifth semester student must be present on at least 15 hours (50%) of lectures to get minimal 3 points (each lecture hour is calculated as 0.2 points). A student can get a maximum of 6 points for this element.
Seminars attendance	
Practicals attendance	During the fifth semester, the student must attend at least 42 hours of practicals (the total number of hours of practicals is 60) in order to obtain a minimum of 8 points. A maximum of 12 points can be obtained from this element (if the student is present at all practicals).
Active participation in seminars and practicals	In this element, student must achieve a minimum of 5 points, and can achieve a maximum of 10 points. Each student has the obligation to perform at least two necropsies during semester, where success is scored as follows: 0-5 points (0 points = did not perform necropsy; 1 point = performed necropsy but showed insufficient knowledge of the theory and techniques; 2 points = performed necropsy, good knowledge of technique but lack of knowledge in theory; 3 points = performed necropsy, good knowledge of theory and techniques; 4 points = performed necropsy, very good knowledge of theory and techniques; 5 points = performed necropsy, excellent knowledge of the theory and technique). The range of 5 to 10 points student achieves by combining ie. adding two values earned by necropsies (eg. student carried out one necropsy at which he/she demonstrated good knowledge of theory and technique [3 points] and another one at which he/she demonstrated excellent knowledge of theory and technique [5 points], that way the student achieves 8 points from participation at practical).
Final exam	Minimal conditions for passing the first, second, third and fourth evaluation elements are all summed up and they are worth 36 points all together. In order to take the final exam a student must gain the 36 points. In order to pass the final exam, a student must achieve a minimum of 24 points. The maximum number of points on the final exam is 40.

	The final exam consists of written and oral part. The written part of the exam is in essay form. It lasts 40 minutes and consists of 5 questions. Each question is scored with a maximum of 5 points. A minimum of 15 points is required to pass the written exam, and minimum of 2 points per each question should be achieved. Each question will have guidelines to clarify what is expected in the answer. A maximum of 25 is possible to get from written part of the exam. After scoring a written part of the exam, students who achieve a minimum of 15 points can access the oral part of the exam. Students who do not achieve the minimum score (15 points) on the written part of the exam, receive a negative grade and will not be able to access the oral part of the exam. Questions at the oral part of the exam are on the same principe as essay type question in the written part. The grade on the final exam is the one derived from the points that student has collected from the written and oral part of the exam. The maximum amount of points in final exam is 40. The distribution of grades is done according to the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine and the Course Syllabus. Note: on the final exam students should know the material of the colloquiums, and they can be asked questions from colloquiums.
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine. Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. **Article 41:** a student can justifiably be absent from up to 50 % of the lectures; 30% of the seminars and 30 % of the practicals.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	During the semester, two colloquiums will be held (1. Written colloquium from the chapter "Acute inflammation"; 2. Practical examination of the Necropsy). **Written colloquium is from the chapter "Acute and chronic inflammation".** In this colloquium it is necessary to achieve at least 10 points; maximum possible points is 16. Colloquium consists of 32 questions; in order to achieve the minimum number of points it is required to answer 20 questions (each correct answer is awarded 0.5 points). The incorrect answers will be counted as negative points (so the total score will be reduced for the number of incorrect answers, while the unanswered questions will not be scored). The colloquium will be held at the Department of Veterinary Pathology. It is required to apply for the colloquiums with the internal application forms that are provided in the student administration office. Dates of colloquiums "Acute and chronic inflammation" and Application dedlines are: 1. Term: 27.11.2023. at 7.30 (Application until 28.11.2023. at 12.00 AM).

	2. Term: 14.12.2023. at 7.30 (Application until 13.12.2023. at 12.00 AM). 3. Term: 11.1.2024. at 7.30 (Application until 10.1.2024. at 12.00 AM). The second colloquium is a **practical examination of the necropsy**. From this colloquium it is necessary to achieve a minimum of 10 points, and maximum possible points is 16. Practical examination of the necropsy is performed in the Necropsy hall by examining the practical and theoretical knowledge of the necropsy. Dates of colloquiums are: 1. Term: 21.12.2023. (last practical, Necropsy hall – application is not required). 2. Term: 12.1.2024. at 7.30 (Application until 11.1.2024. at 12.00 AM). 3. Term: 19.1.2024. at 7.30 (Application until 18.1.2024. at 12.00 AM).
Final exams (dates)	03.11.2023.; 04.12.2023.; 10.1.2024.; 05.2.2024.; 15.2.2024.
Form of final exam	Written and Oral exam.

LITERATURE

Obligatory literature	1. J. F. Zachary: Pathologic Basis of Disease, 6th edition, Elsevier, Philadelphia, 2017. 2. D. O. Slauson, Cooper, B. J.: Mechanisms of Disease. 3th edition, Mosby, St. Louis, 2002. 3. Notes and presentations provided by lecturers.
Optional literature	1. V. Kumar, Abul K. Abbas, N. Fausto: Robbins and Cotran Pathologic Basis of Disease, 9th. Elsevier Saunders, Philadelphia, 2015. 2. Grabarević, Željko i Sabočanec, Ruža (ur.): Osnove razudbe domaćih životinja. Medicinska naklada, Zagreb, 2016.

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	Upon completion of this course, students will acquire knowledge of general pathology and pathology of organ systems, which is necessary to follow further classes in clinical subjects. The ultimate goal is that upon completion of the study students can recognize the pathological process and make the correct diagnosis in order to chose appropriate therapy, or if the animals die, in the correct way (dissection and

	other additional laboratory tests) make an accurate diagnosis and thus act preventively in other animals .
Learning outcomes	After successfull competition of the course the student will be able to: - acquire sufficient knowledge about the origin and development of the disease at the cellular level - acquire knowledge about the morphological (macroscopic and microscopic) manifestation of pathological processes on various tissues and organs - carry out the classification and categorization of various pathological changes - independently perform necropsy of domestic, wild, exotic and laboratory animals

GRADING SCHEME

Points	*Grade*
Up to 59	1 (F)
60-68	2 (E)
69-76	2 (D)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

Course leader:
Assoc. Prof. Marko Hohšteter

Head of Department/Clinic:
Assoc. Prof. Ivan-Conrado Šoštarić-Zuckermann, DECVP

Note: The course leader is required to submit a Course Syllabus to all teachers and associates pertaining to the Course

GRADING AND EVALUATION OF STUDENT WORK ON COURSES WITH LECTURES, SEMINARS and PRACTICALS

Type of activity	Minimum number of points	Maximum number of points
Lectures attendance	3	6
Seminar attendance	4	6
Practicals attendance	4	6
Active participation in seminars and practicals	5	10
Continuous knowledge checking (mid-terms)	20	32
Final exam	24	40
TOTAL	60	100

GRADING AND EVALUATION OF STUDENT WORK ON COURSES WITH LECTURES and SEMINARS

Type of activity	Minimum number of points	Maximum number of points
Lecture attendance	3	6
Practicals attendance	8	12
Active participation in practicals	5	10
Continuous knowledge checking (mid-terms)	20	32
Final exam	24	40
TOTAL	60	100

GRADING AND EVALUATION OF STUDENT WORK ON COURSES WITH SEMINARS and EXCERCISES

Type of activity	Minimum number of points	Maximum number of points
Seminar / practicals attendance	11	18
Active participation in seminars and practicals	5	10
Continuous knowledge checking (mid-terms)	20	32
Final exam	24	40
TOTAL	60	100