

UNIVERSITY OF ZAGREB  
FACULTY OF VETERINARY MEDICINE  
Heinzelova 55  
Tel. 01/2390 246  
Division: Basic and Pre-clinical Sciences  
Organizational unit: Anatomy, Histology and Embryology  
E-mail of the course leader: [kuzir@vef.unizg.hr](mailto:kuzir@vef.unizg.hr)  
Register No of the organisational unit:61-05-2023/67  
Zagreb, 03/03/2023



161023	REPUBLIKA HRVATSKA		
Veterinarski fakultet u Zagrebu			
Primljeno:	03.03.2023		
Klasifikacijska oznaka	Org. jed.		
605-03/22-04/35	251-61-32;		
Uruđbeni broj	Prilozi	Vrijednost	
251-61-05/291-23-94	0	-	

## COURSE SYLLABUS

Course name: Histology with General Embryology

Academic year 2022/2023

Course leader: Full Prof. Snježana Kužir

Deputy course leader: teaching assistant Lucija Bastiančić

Guest prof.: Assoc. Prof. Valentina Kubale Dvojmoč, PhD, DVM, Veterinary Faculty, University of Ljubljana

Teachers: Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Magdalena Kolenc, teaching assistant Nikolina Škvorc

First day of classes:27/02/2023

Last day of classes:15/06/2023

### Timetable for LECTURES academic year 2022/2023

LECTURES				
Date	Methodological unit	Teacher	Location / Time	Literature
27/02/2023 1 <sup>st</sup> lecture	Introduction, General Embryology	Full Prof. Snježana Kužir	Histology practical room 10am-12am	AUGHEY, E., F. L. FRYE (2001): Comparative Veterinary Histology with Clinical Correlates. Manson Publishing/The Veterinary Press, London, UK.
28/02/2023 2 <sup>nd</sup> lecture	Epithelial tissue	Full Prof. Snježana Kužir	Histology practical room 10am-12am	
10/03/2023 3 <sup>rd</sup> lecture	Connective tissue	Full Prof. Snježana Kužir	Histology practical room 12pm-2pm	
24/03/2023 4 <sup>th</sup> lecture	Supportive tissue	Full Prof. Snježana Kužir	Histology practical room 10am-12am	
31/03/2023 5 <sup>th</sup> lecture	Blood	Full Prof. Snježana Kužir	Histology practical room 1pm-2pm	BACHA, W. J., L. M. BACHA (2012): Color Atlas of Veterinary Histology. 3rd ed. J. Willey-Blackwell, Chichester, UK
04/04/2023 6 <sup>th</sup> lecture	Muscle tissue	Full Prof. Snježana Kužir	Histology practical room 10am-11am	
11/04/2023 7 <sup>th</sup> lecture	Nerve tissue	Full Prof. Snježana Kužir	Histology practical room 10am-11am	
17/04/2023 8 <sup>th</sup> lecture	Central nervous system	Full Prof. Snježana Kužir	Histology practical room 10am-11am	BANKS, W. J. (1993): Applied Veterinary Histology. Mosby-Year Book, Inc. St. Louis.
19/04/2023 9 <sup>th</sup> lecture	Eye and ear	Full Prof. Snježana Kužir	Histology practical room 10am-11am	
25/04/2023	Endocrine system	Full Prof.	Histology practical room	

10 <sup>th</sup> lecture		Snježana Kužir	12pm-1pm	HYTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of Domestic Animal Embryology. Saunders Elsevier, Philadelphia.
28/04/2023 11 <sup>th</sup> lecture	Integumentary system	Full Prof. Snježana Kužir	Histology practical room 11am-12am	
03/05/2023 12 <sup>th</sup> lecture	Cardiovascular system	Full Prof. Snježana Kužir	Histology practical room 9am-10am	
10/05/2023 13 <sup>th</sup> lecture	Lymphatic system	Assoc. Prof. Valentina Kubale Dvojmoč	Histology practical room 8am-10am	McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary Embryology. Blackwell Publishing, Dublin.
17/05/2023 14 <sup>th</sup> lecture	Respiratory system	Full Prof. Snježana Kužir	Histology practical room 10am-12am	
23/05/2023 15 <sup>th</sup> lecture	Digestive system I	Full Prof. Snježana Kužir	Histology practical room 8am-10am	
26/05/2023 16 <sup>th</sup> lecture	Digestive system II	Full Prof. Snježana Kužir	Histology practical room 10am-12am	SAMUELSON, D. A. (2006): Textbook of Veterinary Histology. Saunders (W. B.) Co Ltd, London, UK
02/06/2023 17 <sup>th</sup> lecture	Urinary system	Full Prof. Snježana Kužir	Histology practical room 10am-12am	
06/06/2023 18 <sup>th</sup> lecture	Male reproductive system	Full Prof. Snježana Kužir	Histology practical room 2pm-3pm	
12/06/2023 19 <sup>th</sup> lecture	Female reproductive system, Placenta	Full Prof. Snježana Kužir	Histology practical room 9am-12am	PP of lectures and exercises

**Timetable for PRACTICALS academic year 2022/2023**

<b>PRACTICALS</b>						
<b>Date</b>	<b>Methodological unit</b>	<b>Teacher</b>	<b>Type of practical (Article 31. of Regulation)</b>	<b>Group</b>	<b>Location / time</b>	<b>Literature</b>
01/03/2023 1 <sup>st</sup> practical	Cytology, Histological methodes	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
02/03/2023 2 <sup>nd</sup> practical	Epithelial tissue I	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
03/03/2023 3 <sup>rd</sup> practical	Epithelial tissue II	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
07/03/2023 4 <sup>th</sup> practical	Epithelial tissue III	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
14/03/2023 5 <sup>th</sup> practical	Connective tissue I	Full Prof. Snježana Kužir, teaching assistant	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature

		Lucija Bastiančić, teaching assistant Nikolina Škvorc				
17/03/2023 6 <sup>th</sup> practical	Connective tissue II	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
28/03/2023 7 <sup>th</sup> practical	Supportive tissue: cartilage	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
31/03/2023 8 <sup>th</sup> practical	Supportive tissue: bone	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
03/04/2023 9 <sup>th</sup> practical	Blood	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
05/04/2023 10 <sup>th</sup> practical	Muscle tissue	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature

		Nikolina Škvorc				
12/04/2023 11 <sup>th</sup> practical	Nerve tissue	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
13/04/2023 12 <sup>th</sup> practical	Revision	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
17/4/2023	TEST I	<b>Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc</b>	TEST I	1, 2, 3	Large lecture room 7am-8am	See: obligatory and optional literature
18/04/2023 13 <sup>th</sup> practical	Central nervous system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
19/04/2023 14 <sup>th</sup> practical	Eye and ear	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant	laboratory	1, 2, 3	Histology practical room 11am-1pm	See: obligatory and optional literature

		Nikolina Škvorc				
27/04/2023 15 <sup>th</sup> practical	Endocrine system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
28/04/2023 16 <sup>th</sup> practical	Integumentary system I	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
02/05/2023 17 <sup>th</sup> practical	Integumentary system II	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
05/05/2023 18 <sup>th</sup> practical	Cardiovascular system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
10/05/2023 19 <sup>th</sup> practical	Lymphatic system I	Assoc. Prof. Valentina Kubale Dvojmoč, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature

16/05/2023 20 <sup>th</sup> practical	Lymphatic system II	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
19/05/2023 21 <sup>st</sup> practical	Respiratory system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 8am-10am	See: obligatory and optional literature
23/05/2023 22 <sup>nd</sup> practical	Digestive system Ia	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
25/05/2023 23 <sup>rd</sup> practical	Digestive system Ib	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
31/05/2023 24 <sup>th</sup> practical	Digestive system IIa	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
01/06/2023 25 <sup>th</sup> practical	Digestive system IIb	Full Prof. Snježana Kužir,	laboratory	1, 2, 3	Histology practical room	See: obligatory and optional literature



		teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc			2pm-4pm	
06/06/2023 26 <sup>th</sup> practical	Urinary system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
07/06/2023 27 <sup>th</sup> practical	Male rep. system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 9am-11am	See: obligatory and optional literature
13/06/2023 25 <sup>th</sup> practical	Female rep. system	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature
14/06/2023 29 <sup>th</sup> practical	Placenta	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc	laboratory	1, 2, 3	Histology practical room 10am-12am	See: obligatory and optional literature
15/06/2023 30 <sup>th</sup> practical	Revision	Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić,	laboratory	1, 2, 3	Histology practical room 12pm-2pm	See: obligatory and optional literature

		teaching assistant Nikolina Škvorc				
<b>19/06/2023</b>	<b>TEST II</b>	<b>Full Prof. Snježana Kužir, teaching assistant Lucija Bastiančić, teaching assistant Nikolina Škvorc</b>	<b>TEST II</b>	<b>1, 2, 3</b>	<b>Large lecture room 9am-10am</b>	<b>See: obligatory and optional literature</b>

### STUDENT OBLIGATIONS

Lecture attendance	Presence at lectures (min 15h).
Seminars attendance	-
Practicals attendance	Presence in practicals (min. 48h).
Active participation in seminars and practicals	Activity in training (a minimum of 5 points earned).
Final exam	<p>The final exam is oral and knowledge of histological slides is tested. Each student will chose randomly a closed box with 5 slides. For each slide the student can gain 8 points. If the student does not recognize tissue or the organ, he/she shall lose the opportunity to be tested orally on this slide. The minimum number of points is 24 and the maximum number of points is 40.</p> <p>The final grade is formed on the basis of the total sum of all five evaluation elements (attending lectures, attending the practicals, participation at practicals, preliminary exams and points from the final exam).</p>
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2022). 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; 20% of the seminars and 20 % of the exercises.

### GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	<p>Passed examination of two preliminary exams (min. 10 + 10 points earned).</p> <p>Two preliminary exams will be organized during the course. Both are worth minimum 10 and maximum 16 points. To take the oral exam students must have minimal 10 points from each. In case she/he does not earn enough points, the student has the right to repeat preliminary exam twice again. In this context it is possible to gain 32 points maximum</p> <p><b>17/4/2023, 25/4/2023, 2/5/2023</b>  <b>19/6/2023, 26/6/2023, 4/9/2023</b></p>
Final exams (dates)	<b>28/6/2023, 10/7/2023, 7/9/2023, 15/9/2023</b>
Form of final exam	Oral exam (24-40 points)

### LITERATURE

Obligatory literature	<p>AUGHEY, E., F. L. FRYE (2001): Comparative Veterinary Histology with Clinical Correlates. Manson Publishing/The Veterinary Press, London, UK.</p> <p>BACHA, W. J., L. M. BACHA (2012): Color Atlas of Veterinary Histology. 3rd ed. J. Willey-Blackwell, Chichester, UK</p> <p>BANKS, W. J. (1993): Applied Veterinary Histology. Mosby-Year Book, Inc. St. Louis.</p> <p>HYTTEL, P., F. SINOWATZ, M. VEJLSTED (2010): Essentials of Domestic Animal Embryology. Saunders Elsevier, Philadelphia.</p> <p>McGEADY, T. A., P. J. QUINN, E. S. FITZPATRICK, M. T. RYAN (2006): Veterinary Embryology. Blackwell Publishing, Dublin.</p>
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	SAMUELSON, D. A. (2006): Textbook of Veterinary Histology. Saunders (W. B.) Co Ltd, London, UK
	PP of lectures and exercises
Optional literature	DELLMAN, H.- D. (1993): Textbook of Veterinary Histology. Lea & Febiger. Philadelphia. KERR, J. B. (2000): Atlas of Functional Histology. Mosby, London, St. Louis, Philadelphia, Sydney, Tokyo. MESCHER, A. (2013): Junqueira's Basic Histology: Text and Atlas. 13th ed. Mc Graw Hill Companies, Inc NODEN, D. M., A. DE LAHUNTA (1985): The Embryology of Domestic Animals. Developmental Mechanisms and Malformations. Williams & Wilkins. Baltimore, Hong Kong, London, Sydney. SADLER, T. W. (2006): Langman's Medical Embryology, Lippincott Williams & Wilkins a Wolters Kluwer business. 10th ed. Philadelphia, Baltimore, New York, London, Buenos Aires, Hong Kong, Sydney, Tokyo. YOUNG, B., J. W. HEATH (2000): Wheater's Functional Histology, A Text and Colour Atlas. Churchill Livingstone, Edinburgh, London, New York, Oxford, Philadelphia, St. Louis, Sydney, Toronto.

### **OBJECTIVES AND LEARNING OUTCOMES**

Course objectives	<p>Histology is one of the basic subjects of the medical sciences; it studies the structure of human and animal bodies, which can be seen only with the help of optic aids. Etymologically, histology is a science that studies the tissues of a body. However, it explores the complete microscopic and submicroscopic system of the organism.</p> <p>During the study, students of veterinary medicine improve their knowledge from macroscopic anatomy and at the same time, they gain insight into the correlation between the structure and function of organs and organic systems. Knowledge of the normal structures is essential for the recognition of changes in the structure of the tissue, organs and organic systems.</p> <p>Embryology deals with embryonic development and enables the understanding of complex interrelations in the body of an animal. It is also of practical importance since it explains the emergence of anomalies during development.</p>
Learning outcomes	<p>By the end of this course the student should be able to:</p> <ul style="list-style-type: none"><li>-recognize and define the basic elements of the microscopic structures of tissues and organs of animals</li><li>-explain and compare the structure of certain organs in different animal species;</li><li>-propose the necessary histological method of processing the sample;</li><li>-independently cut off a piece of tissue and fix it correctly for the selected histological method;</li><li>-use the microscope efficiently for the purpose of analysis and study of histological slides;</li><li>-recognize and analyze the histological slides of various organs and tissues;</li><li>-examine the relations between the structures and development of domestic animals</li></ul>

**GRADING SCHEME**

<i>Points</i>	<i>Grade</i>
Up to 59	1 (F)
60-76	2 (D,E)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

Course leader



Full Prof. Snježana Kužir

Head of organizational unit:



Full Prof. Martina Đuras

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