

2024./2025.

MOLECULAR BIOLOGY AND GENOMICS IN VETERINARY MEDICINE

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
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Register no. 61-02-297/24

Zagreb, 4. 9. 2024.



190525	REPUBLIKA HRVATSKA		
Veterinarski fakultet u Zagrebu			
Primljeno:	04.09.2024		
Klasifikacijska oznaka		Org. jed.	
602-04/24-22/38		251-61-41; 251-61-32; 251-61-02;	
Urudžbeni broj		Prilozi	Vrijednost
251-61-02-24-25		0	-

COURSE SYLLABUS

Course name: **Molecular Biology and Genomics in Veterinary Medicine**

Academic year 2024./2025.

Course leader: Associate professor Daniel Špoljarić DVM, PhD
The substitute of course leader: Full professor Maja Popović, DVM, PhD

Teachers:

Full professor Maja Popović DVM, PhD
Full professor Ksenija Vlahović DVM, PhD
Full professor Josip Kusak DVM, PhD
Full professor Tomislav Gomerčić DVM, PhD
Associate professor Daniel Špoljarić DVM, PhD
Assistant Ira Topličanec, DVM, PhD

First day of classes: 14.10. 2024.

Last day of classes: 20.12. 2024.

Activities - Molecular Biology and Genomics in Veterinary Medicine (1/3)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
14/10/2024	13:30	15:00	p01 Historical aspects and future challenges	3E-1, 3E-2, 3E-3		1:30	Popović M.	P_fizika
15/10/2024	11:45	13:15	p02 Cell cycle	3E-1, 3E-2, 3E-3		1:30	Špoljarić D.	P_fizika
16/10/2024	8:00	9:30	s01 Nucleic acids	3E-1, 3E-2, 3E-3		1:30	Špoljarić D.	P_fizika
17/10/2024	12:15	13:45	s02 Replication, Transcription, Translation	3E-1, 3E-2, 3E-3		1:30	Špoljarić D.	P_kemija
17/10/2024	15:30	16:15	p03 Gene expression regulation	3E-1, 3E-2, 3E-3		0:45	Gomerčić T.	P_fizika
21/10/2024	13:30	15:00	s03 Transmission of cellular signals	3E-1, 3E-2, 3E-3		1:30	Špoljarić D.	P_farmakologija
22/10/2024	13:30	15:00	s04 DNA repair mechanisms	3E-1, 3E-2, 3E-3		1:30	Popović M.	P_fizika
29/10/2024	15:15	16:45	s05 Genome mutations	3E-1, 3E-2, 3E-3		1:30	Gomerčić T.	P_fizika
04/11/2024	8:15	9:45	v01 Gene expression	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
04/11/2024	13:45	15:15	v01 Gene expression	3E-3		1:30	Nastavnici na predmetu	P_farmakologija
11/11/2024	11:30	13:00	v02 Replication, transcription, translation	3E-3		1:30	Nastavnici na predmetu	P_patologija
12/11/2024	8:00	9:30	v02 Replication, transcription, translation	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
20/11/2024	12:00	13:30	v03 Molecular methods	3E-3		1:30	Nastavnici na predmetu	P_patologija
20/11/2024	15:00	16:30	v03 Molecular methods	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija

Activities - Molecular Biology and Genomics in Veterinary Medicine (2/3)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
26/11/2024	8:15	9:45	v04 Point mutations	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_farmakologija
26/11/2024	13:30	15:00	v04 Point mutations	3E-3		1:30	Nastavnici na predmetu	P_farmakologija
27/11/2024	10:00	11:30	v05 Mendel I	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
28/11/2024	14:00	15:30	v05 Mendel I	3E-3		1:30	Nastavnici na predmetu	P_patologija
29/11/2024	8:15	9:45	v06 Mendel II and III	3E-3		1:30	Nastavnici na predmetu	P_farmakologija
02/12/2024	14:30	16:00	v06 Mendel II and III	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
04/12/2024	15:00	16:30	v07 Chromosomal inheritance	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
05/12/2024	8:00	9:30	v07 Chromosomal inheritance	3E-3		1:30	Nastavnici na predmetu	P_farmakologija
09/12/2024	8:15	9:45	v08 Allele interactions	3E-3		1:30	Nastavnici na predmetu	P_patologija
09/12/2024	10:00	11:30	v08 Allele interactions	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
10/12/2024	15:00	16:30	v09 Non-Mendelian inheritance	3E-3		1:30	Nastavnici na predmetu	P_patologija
11/12/2024	15:00	16:30	v09 Non-Mendelian inheritance	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija

Activities - Molecular Biology and Genomics in Veterinary Medicine (3/3)								
Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
12/12/2024	8:00	9:30	v10 Multiple genes	3E-3		1:30	Nastavnici na predmetu	P_patologija
12/12/2024	10:00	11:30	v10 Multiple genes	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
13/12/2024	8:15	9:45	v11 Population genetics	3E-3		1:30	Nastavnici na predmetu	P_patologija
16/12/2024	10:00	11:30	v11 Population genetics	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_patologija
18/12/2024	11:45	13:15	v12 Lab accreditation	3E-1, 3E-2		1:30	Nastavnici na predmetu	P_farmakologija
19/12/2024	15:00	16:30	v12 Lab accreditation	3E-3		1:30	Nastavnici na predmetu	P_patologija
20/12/2024	13:30	18:00	v13,14,15 Practical methods	3E-1, 3E-2, 3E-3		4:30	Nastavnici na predmetu	P_patologija
			Molecular Biology and Genomics in Veterinary Medicine		Final exam	1:00	Popović M.	P_fizika
Total: 34						52:45		

STUDENT OBLIGATIONS

Lecture attendance	During the session student must attend 3 hours of lectures in order to gain 3 minimal points during the semester. The maximum gained number of points from this evaluation element is 6 points.
Seminars attendance	During the session student must attend 7 hours of seminars in order to gain 4 minimal points during the semester. The maximum gained number of points from this evaluation element is 6 points.
Practicals attendance	During the session student must attend 21 hours of exercise lessons in order to gain 4 minimal points during the semester. The maximum gained number of points from this evaluation element is 6 points.
Active participation in seminars and practicals	During the session at the time of exercises student must do provided tasks from 15 programming exercises and 5 seminars and for a completed task she/he gets a signature from the lecturer. During the session student must gain at least 5 points. Maximal number of points gained from this evaluation element is 10.
Final exam	The final exam starts with a student's short analysis of results gained from the first four types of activities of attending lecture. Questions in the final exam will be put in a way that a student can answer in writing. The maximum number of points that can be gained from the final exam is 60 points. Student must show at least a sufficient knowledge at the final exam, with no regard to gained number of points from the first four evaluation elements, which could be higher than 36. The minimal number of points a student must gain at the final exam is 36 in order to gain minimal number of 24 points. Regardless of a fact that a student gained the number of points from the first four evaluation elements on the basis of makeup preliminary exam or not, the same rules are valid for forming the final mark. The final mark is formed on the basis of total sum from all five evaluation elements.
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 exercises.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	During the session 4 preliminary exams will be organized at the time of exercises. Each correctly done task or well answered question is worth 1 point. In context of this evaluation element it is possible to gain the maximum of 35 points. Student must gain total of 22 points from the preliminary exams in order to gain minimum of 20 points. The total gained number of points from this evaluation element is 32 points. Student who does not gain minimum of 22 points during the session has right to take a makeup preliminary exam which will comprise material from all programming exercises and will be organized upon
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	completion of the teaching in the session. Total number of points at the preliminary exam is 35. Student who does the makeup exam with better-than 50% results has right to take the final exam.
Final exams (dates)	04/11/2024; 04/12/2024; 12/02/2025; 21/02/2025.
Form of final exam	Written exam

LITERATURE

Obligatory literature	G.M. Cooper, R.E. Hausman (2015): The Cell: A Molecular Approach
Optional literature	R. H Tamarin (2002) : Principles of genetics. McGraww Hill, Boston, New York, London G.B Johnson (2000): The living world. McGraww Hill, Boston, New York, London, 2000

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	Students will be able to recognize importance and contribution of genomics and proteomics in veterinary medicine and biotechnology. They will be able to comprehend and check basic laws of inheritance at the molecular level, from phenotype expression in prokaryotes and animals, up to qualitative and quantitative phenogenetics of artificial selection. They will acquire knowledge about molecular processes of informative macromolecules up to genome expression in prokaryotes and animals. They will be able to recognize causes and effects of spontaneous and induced mutations in animals. They will acquire with the role and biomedical importance of molecular signals and differential molecules involved in the regulation of cell and life cycle in animals, particularly during their embryonic development. Students will be able to recognize the methods of molecular biology applicable in veterinary medicine and comprehend their importance in prevention, diagnostic and therapy, as well as in the veterinary biotechnology. They will realize possible risks of applying recombinant DNA technology for health and welfare of animals and humans, as well as for environment.
Learning outcomes	<ol style="list-style-type: none"> 1. Compare of contemporary aspects of cytology, molecular biology and genetics in veterinary medicine, public health and forensic 2. Considering of basic principles of molecular research of animal cells and tissue 3. Considering of molecular processes of replication, transcription and translation of animal information macromolecules 4. Compare of health and ecological justification and risk of using transgenic animal organisms and cells, biotechnological preparations (cytokines, hormones, enzymes, vaccines, medications) and genetically modified food of animal origin 5. Identify genetic disorders of animals of interest for veterinary medicine 6. Selecting molecular-genetic method for preventive, diagnostic and therapy of ill animal.

GRADING SCHEME

<i>Points</i>	<i>Grade</i>
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:

Associate professor Daniel Špoljarić DVM, PhD



Head of Department of veterinary biology:

Full professor Maja Popović DVM, PhD



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