

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
Tel. 01/2390-153
Division: ANIMAL PRODUCTION AND BIOTECHNOLOGY
Organizational unit: BIOLOGY AND PATHOLOGY OF FISH AND BEES
E-mail of the course leader: egjurcevic@vef.unizg.hr
Register No of the organisational unit: 251-61-14/25-22
Zagreb, 12/2/2025

	
198109	REPUBLIKA HRVATSKA
Veterinarski fakultet u Zagrebu	
Primljeno:	12.02.2025
Klasifikacijska oznaka	Org. jed.
602-04/24-22/38	251-61-41;251-61-32;
Uredbeni broj	Prilozi Vrijednost
251-61-14-25-163	0 -

COURSE SYLLABUS

Course name: Biology and Pathology of Aquatic Organisms
Academic year 2024/2025

Course leader: Full Prof. Emil Gjurić

Deputy course leader: Assoc. Prof. Krešimir Matanović

Teachers: Full Prof. Emil Gjurić
Assoc. Prof. Krešimir Matanović
Valerija Benko PhD

First day of classes: 5/3/2025
Last day of classes: 11/6/2025

Activities - Biology and Pathology of Aquatic Organisms (1/2)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
05/03/2025	10:00	11:30	p01 Water	8E-1, 8E-2, 8E-3		1:30	Matanovic K.	P_ribe i pcele
07/03/2025	14:15	15:45	p02 Natural spawning	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_fizika
13/03/2025	15:00	16:30	v01 Systematic of freshwater fish	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
14/03/2025	15:30	17:00	v02 Systematic of marine fish and shellfish	8E-1, 8E-2, 8E-3		1:30	Matanovic K.	P_ribe i pcele
17/03/2025	16:15	17:45	v03 Fish anatomy I	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
28/03/2025	15:15	16:45	p03 Artificial spawning	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
02/04/2025	10:15	11:45	v04 Fish anatomy II	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
07/04/2025	16:00	17:30	v05 Dissection of common carp and rainbow trout	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
14/04/2025	12:30	14:00	v06 Dissection of marine fish and shellfish	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
16/04/2025	7:30	9:00	v07 Post-mortem examination of fish I	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
08/05/2025	15:00	16:30	p04 Viral fish diseases	8E-1, 8E-2, 8E-3		1:30	Gjurcevic E.	P_fizika
12/05/2025	7:30	9:00	p05 Bacterial fish diseases	8E-1, 8E-2, 8E-3		1:30	Matanovic K.	P_ribe i pcele
15/05/2025	11:30	13:00	v08 Post-mortem examination of fish II	8E-1, 8E-2		1:30	Gjurcevic E.	P_ribe i pcele
15/05/2025	16:00	16:45	p06 Parasitic fish diseases	8E-1, 8E-2, 8E-3		0:45	Gjurcevic E.	P_ribe i pcele
16/05/2025	11:15	12:45	v08 Post-mortem examination of fish II	8E-3		1:30	Gjurcevic E.	P_ribe i pcele
19/05/2025	16:15	17:45	v09 Virological and bacteriological procedures	8E-1		1:30	Gjurcevic E.	P_ribe i pcele

Activities - Biology and Pathology of Aquatic Organisms (2/2)								
Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
26/05/2025	16:15	17:45	v09 Virological and bacteriological procedures	8E-2, 8E-3		1:30	Gjurcevic E.	P_ribe i pcele
27/05/2025	16:15	17:45	v10 Collection of samples	8E-1, 8E-2, 8E-3, V_ribe i pcele		1:30	Matanovic K.	P_ribe i pcele
02/06/2025	8:00	9:00	Biology and Pathology of Aquatic Organisms	8E-1, 8E-2, 8E-3	Kolokvij	1:00	Gjurcevic E.	P_ribe i pcele
04/06/2025	8:00	16:00	v11 Field Work - Cyprinid fish farm	8E-3		8:00	Gjurcevic E.	
04/06/2025	8:00	16:00	v11 Field Work - Cyprinid fish farm	8E-1, 8E-2		8:00	Gjurcevic E.	
11/06/2025	8:00	16:00	v12 Field Work - Trout fish farm	8E-3		8:00	Matanovic K.	
11/06/2025	8:00	16:00	v12 Field Work - Trout fish farm	8E-1, 8E-2		8:00	Matanovic K.	
Total: 23						59:15		

STUDENT OBLIGATIONS

Lecture attendance	Attending lectures: 3-6 points (1 lecture hour equals 0.54 point)
Practicals attendance	Attending practicals: 8-12 points. Student must attend at least 17 hours of practicals to achieve minimum of 8 points.
Active participation in seminars and practicals	Participation at exercises: 5-10 points (evaluated with short oral tests)
Final exam	Final exam – oral: 24-40 points (5 questions): 1 question equals 8 points
Examination requirements	Student requirements are defined in the Regulations on studying in the University Integrated Undergraduate and Graduate Study Programme <i>Veterinary Medicine</i> (Article 64). Given the above, the student may be absent from classes in an individual course up to 50 percent of the class hours of lectures, 30 percent of the class hours of seminars, and 30 percent of the class hours of practicals. An exception is any course with a small number of hours of specific teaching form (12 hours or less per semester), where absence of greater than 50 percent is permitted, with mandatory justification of the absence and that all missed classes are made up in line with the conditions set by the head of the course.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	Continuous knowledge checking (1 preliminary exam – 20 questions): 20-32 points (1 question equals 1.6 points)
Final exams (dates)	1/7/2025, 15/7/2025, 9/9/2025 and 19/9/2025
Form of final exam	Oral

LITERATURE

Obligatory literature	<ol style="list-style-type: none">1. BARDACH, J. E., J. H. RYTHER, W. O. McLARNEY (1972): Aquaculture: The Farming and Husbandry of Freshwater and Marine Organisms. Wiley-Interscience, New York, London, Sydney, Toronto.2. HOLE, D., D. BUCKE, P. BURGESS, I. WELLBY (2001): Diseases of carp and other cyprinid fishes. Fishing News Books, London.3. NOGA, E. J. (2000): Fish disease: Diagnosis and Treatment. Iowa State University Press, Ames.4. ROBERTS, R. J. (2001): Fish pathology, 3rd ed. W. B. Saunders, London.5. WOO, P. T. K., D. W. BRUNO (1999): Fish Diseases and disorders, Vol. 3.: Viral, bacterial and fungal infections. CABI Publishing, Wallingford.6. PP presentations of lectures and practicals.
Optional literature	<ol style="list-style-type: none">1. BOYD, C. E. (1990): Water Quality in Ponds for Aquaculture. Auburn University, Alabama.2. FERGUSON, H. W. (2006): Systemic pathology of fish: A text and atlas of normal tissues in teleosts and their responses in disease. Scotian Press, London.3. GREENBERG, D. B. (1960): Trout farming. Chilton company – book division, Philadelphia, New York.4. HORVATH, L., G. TAMAS, C. SEAGRAVE (1992): Carp and pond fish culture. Fishing News Book, Oxford.5. PLUMB, J. A. (1999): Health maintenance and principal microbial diseases of cultures fishes. Iowa State University.6. SINDERMANN, C. J. (1990): Principal diseases of marine fish and shellfish. Academic Press, London.

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	During lectures and exercises, students obtain general knowledge about breeding of aquatic organisms in order to comprehend the importance and role of veterinarians in recognising and controlling aquatic organism diseases. The skills which one must accomplish are proper examination of aquatic organisms, recognition of clinical signs, sampling and sending the materials for laboratory procedures, and also prevention and therapy in aquaculture.
Learning outcomes	<ol style="list-style-type: none">1. Distinguish fish species and other aquatic organisms important for breeding2. Understand the basic principles of farming of aquatic organisms3. Explain the importance and role of veterinarians in maintenance of fish health and human health4. Perform routine diagnostic examination, recognize clinical signs of disease5. Collect and transport samples for laboratory examinations6. Apply therapeutic measures and measures for prevention of disease.

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



Head of organizational unit:



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