UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzelova 55
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Division of Veterinary Public Health and Food Safety
Unit of Pharmacology and Toxicology
E-mail of the course leader: apcrnic@vef.unizg.hr
Register No of the organisational unit: 61-10-26/20

Zagreb, 27/01/2026

COURSE SYLLABUS

Course name: Toxicology
Academic year 2025/2026

Course leader: Full Prof. Andreja Prevendar Crnić

Deputy course leader: Full Prof. Frane Božić

Teachers:
Full Prof. Andreja Prevendar Crnić, DVM, PhD
Full Prof. Frane Božić, DVM, PhD
Teaching assistant Ena Oster, DVM, PhD
Teaching assistant Nikola Čudina, DVM
Associate teachers:
Dr Maja Lang Balija, DVM PhD

First day of classes: 27/02/2026
Last day of classes: 10/06/2026

Activities - Toxicology (1/3)

Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
27/02/2026	8:00	9:30	p01 Introduction to veterinary toxicology	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
02/03/2026	13:15	14:45	p02 Pesticides	8E-1, 8E-2, 8E-3, P_farmakologija		1:30	Prevendar Crnić A.	P_farmakologija
03/03/2026	14:45	16:15	p03 Pyrethrin and pyrethroids	8E-1, 8E-2, 8E-3, P_farmakologija		1:30	Prevendar Crnić A.	P_farmakologija
04/03/2026	13:00	14:30	p04 Anticoagulants	8E-1, 8E-2, 8E-3, P_farmakologija		1:30	Prevendar Crnić A.	P_farmakologija
06/03/2026	14:00	15:30	p05 Heavy metals I	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
11/03/2026	10:00	11:30	v01 Introduction, procedures with a poisoned animal	8E-3		1:30	Oster E.	P_farmakologija
13/03/2026	10:30	12:00	v01 Introduction, procedures with a poisoned animal	8E-1; 8E-2		1:30	Oster E.	P_farmakologija
16/03/2026	8:00	9:30	v02 DG, Mechanisms of tox. action, therapy	8E-3		1:30	Oster E.	P_farmakologija
17/03/2026	8:00	9:30	v02 DG, Mechanisms of tox. action, therapy	8E-1, 8E-2		1:30	Oster E.	P_farmakologija
17/03/2026	11:30	13:00	p06 Heavy metals II	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
20/03/2026	11:45	13:15	p07 Mycotoxicoses I	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
25/03/2026	14:45	16:15	p08 Mycotoxicoses II	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
26/03/2026	11:30	13:00	v03 Laboratory analytics I	8E-1, 8E-3		1:30	Čudina N.	P_farmakologija
07/04/2026	13:30	15:00	v03 Laboratory analytics I	8E-2		1:30	Čudina N.	P_farmakologija
09/04/2026	8:15	9:45	v04 Case reports I - pesticides	8E-1, 8E-2		1:30	Čudina N.	P_farmakologija

Activities - Toxicology (2/3)

Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
10/04/2026	12:30	14:00	p09 Fluorine, cyanides, and cyanogen plants	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
14/04/2026	8:15	9:45	v04 Case reports I - pesticides	8E-3		1:30	Čudina N.	P_farmakologija
15/04/2026	10:00	11:30	v05 Case reports II - metals	8E-1		1:30	Čudina N.	P_farmakologija
17/04/2026	8:15	9:45	p10 Poisoning with nitrogenous compounds	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
17/04/2026	10:00	11:30	v05 Case reports II - metals	8E-3		1:30	Čudina N.	P_farmakologija
21/04/2026	11:00	12:30	v06 Laboratory analytics II	8E-3		1:30	Oster E.	P_farmakologija
23/04/2026	13:15	14:45	v05 Case reports II - metals	8E-2		1:30	Čudina N.	P_farmakologija
24/04/2026	8:00	9:30	p11 Substances from the immediate environment	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_farmakologija
27/04/2026	10:00	11:30	v06 Laboratory analytics II	8E-1		1:30	Oster E.	P_farmakologija
27/04/2026	11:45	13:15	v06 Laboratory analytics II	8E-2		1:30	Oster E.	P_farmakologija
28/04/2026	8:15	9:45	v07 Ecotoxicology	8E-3		1:30	Čudina N.	P_farmakologija
28/04/2026	13:15	14:45	v07 Ecotoxicology	8E-1, 8E-2		1:30	Čudina N.	P_farmakologija
29/04/2026	9:45	11:15	p12 Antitoxin production	8E-1, 8E-2, 8E-3, P_farmakologija		1:30	Prevendar Crnić A.	P_farmakologija
05/05/2026	8:00	9:30	v08 Toxicoses of fish and birds	8E-1		1:30	Čudina N., Oster E.	P_farmakologija
05/05/2026	9:45	11:15	v08 Toxicoses of fish and birds	8E-2, 8E-3		1:30	Čudina N., Oster E.	P_farmakologija
07/05/2026	13:30	15:00	v09 Intoxication of pets with drugs	8E-1, 8E-2		1:30	Oster E.	P_farmakologija

Activities - Toxicology (3/3)

Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
14/05/2026	10:00	11:30	v09 Intoxication of pets with drugs	8E-3		1:30	Oster E.	P_farmakologija
19/05/2026	13:15	14:45	v10 Organotoxicology	8E-1, 8E-2		1:30	Čudina N.	P_farmakologija
21/05/2026	10:30	12:00	v10 Organotoxicology	8E-3		1:30	Čudina N.	P_farmakologija
26/05/2026	10:00	11:30	v11 Case reports pets I	8E-1, 8E-2		1:30	Oster E.	P_farmakologija
27/05/2026	8:15	9:45	v11 Case reports pets I	8E-3		1:30	Oster E.	P_farmakologija
02/06/2026	9:15	10:45	v12 Case reports pets II	8E-3		1:30	Oster E.	P_farmakologija
03/06/2026	11:30	13:00	v12 Case reports pets II	8E-1, 8E-2		1:30	Oster E.	P_farmakologija
09/06/2026	10:15	11:45	s01 Snake, tick and spider bites	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_fiziologija
10/06/2026	8:30	10:00	s02 Hymenopera bites and nanoparticles	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_fiziologija
10/06/2026	14:00	15:30	s03 Polychlorinateds biphenyls, dioxins	8E-1, 8E-2, 8E-3		1:30	Prevendar Crnić A.	P_fiziologija
Total: 41						**61:30**		

STUDENT OBLIGATIONS

Lecture attendance	24 HOURS 3 – 6 points 1 double period is worth 0.5 point (1 period = 0,25 point) To gain minimal 3 points, a student must attend 6 lectures out of 12
Seminars attendance	6 HOURS 4 – 6 points 1 double period is worth 2 points (1 period = 1 point) To gain minimal 4 points a student must attend 2 seminars out of 3
Practicals attendance	24 HOURS 4 – 6 points 1 double period is worth 0.5 point (1 period = 0.25 point) To gain minimal 4 points a student must attend 9 practicals out of 12
Active participation in seminars and practicals	5 – 10 POINTS Participation at seminars will be evaluated during the presentation of seminar works with 2.5 – 5 points. Participation at exercises will be evaluated with 2.5- 5 points.
Final exam	WRITTEN AND ORAL 24 – 40 POINTS To be eligible for the final exam, students must obtain at least 18 points from attendance and activities and at least 20 points from continuous assessments. During the written exam of the essay type with 5 questions and the oral exam, the student must collect at least 24 points.
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2024). Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. **Regulations On Intergraduate And Graduate Studies, 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)	20 – 32 points 2 colloquia: I. COLLOQUIUM: Verification of the knowledge acquired during the practicals in toxicology, and general toxicological terminology 21/04/2026 and 27/04/2026 during 6th practical (max. 16 points, min. 10 points) II. COLLOQUIUM: Verification of knowledge acquired during the practicals and seminars in toxicology 10/06/2025. during the seminar (max. 16 points, min. 10 points) CORRECTIVE ASSESSMENT, by agreement
Final exams (dates)	16/3/2026; 1/7/2026; 10/7/2026; 4/9/2026; 16/9/2026
Form of final exam	WRITTEN AND ORAL

LITERATURE

Obligatory literature	1. GUPTA, R.C. (2018): Veterinary Toxicology: Basic and Clinical Principles. 3rd ed., Elsevier, Academic Press, London, San Diego, Cambridge, Oxford. 2. BEASLEY, V. (1999): Veterinary toxicology. IVIS, Ithaca, New York. (available at http://www.ivis.org/library.asp) 3. OSWEILER, G. D. (1996): Toxicology. 1st ed., Williams & Wilkins, Philadelphia. 4. POPPENGA, R. H., S. M. GWALTNEY-BRANT (2011): Small Animal Toxicology Essentials. 1st ed., Wiley-Blackwell, Chichester. 5. PP presentations of lectures, exercises and laboratory work – on Merlin
Optional literature	

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	With the knowledge gained at the Toxicology course students will be able to recognize animal poisoning, conduct stabilization, differential diagnosis, and treatment of poisoned patients, assess the success of treatment, and provide for possible wider harmful effects of poisoning (ecotoxicology). Proper sampling and sending materials for toxicological analysis; evaluation of chemical-toxicological test results in case of residues. Within the laboratory exercises for proving toxins in biological samples, students will acquire basic knowledge and skills in analytical toxicology (qualitative and semi-qualitative tests). During the processing of clinical poisoning cases with discussion, students are introduced to clinical toxicology and practice. They will also be able to identify possible sources of pet poisoning among things from their immediate living environment. In addition to poisoning domestic animals and pets, students will gain basic knowledge in the toxicology of birds and fish.
Learning outcomes	1. determine and differentiate poisonings of domestic and companion animals with pesticides, metals and other potentially toxic elements and chemical compounds, mycotoxins, industrial pollutants and plant toxins. 2. recognize possible sources of pet poisoning among their immediate environment. 3. sample appropriate materials for diagnostic procedures and chemical-toxicological analysis. 4. choose and apply appropriate therapeutic procedures and evaluate their effectiveness. 5. evaluate results of chemical-toxicological analyses in accordance with the legally prescribed highest permitted concentrations in food of animal origin. 6. predict possible dangerous consequences of poisons on the ecosystem. 7. recognize poisoning of fish and birds. 8. identify venomous animals and the effects of venom and create a treatment plan.

GRADING SCHEME

Points	*Grade*
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. Andreja Prevendar Crnić, DVM, PhD

Head of organizational unit:
Full Prof. Andreja Prevendar Crnić, DVM, PhD

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