

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Veterinary Medicine
Department of Therapy, Pharmacology, Clinical Diagnostics and biochemistry

Work program (syllabus) of the educational component
obligatory

VETERINARY TOXICOLOGY

Implemented within the educational program

21 VETERINARY MEDICINE

(name)

in specialty **211 VETERINARY MEDICINE**

at the second (master's) level of higher education

Amounts - 2024

Developer: [Signature] Dolbanosova RV, Ph.D., Associate Professor

Considered, approved and approved at the meeting of the Department of Therapy, Pharmacology, Clinical Diagnostics and biochemistry

protocol from 05.06.2024 No 15

[Signature]
(signature)

Olesia Musienko
(surname, initials)

Agreed:

Guarantor of the educational program [Signature]

Dean of the faculty where the educational program is implemented [Signature] O. L. Nethiporenko

[Signature] O. I. Skromaba

Work program review (attached) provided: [Signature] [Signature]

Methodist of the Department of Education Quality, licensing and accreditation [Signature] [Signature]

Registered in the electronic database: date: 24.06.2024

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

	Name OK	Veterinary toxicology		
	Faculty / department	Veterinary medicine Therapy, pharmacology, clinical diagnosis and biochemistry		
	Status OK	Obligatory		
	Program / Specialty (programs), the component of which is OK for (to be filled in for mandatory OK)	21 Veterinary medicine 211 veterinary medicine		
1.	OK can be suggested for (to be filled in for selective OK)			
2.	NRC level	7		
3.	Semester and duration of study	8/9		
4.	Number of ECTS credits	5/4		
5.	The total number of hours and their distribution	Contact work (classes)		Individual work
		Lectures 4/2	Laboratory 6/6	140/112
6.	Language of instruction	English		
7.	Teacher / Coordinator of the educational component	Dolbanosova RV		
8	Contact Information	https://vet.snau.edu.ua/kafedri/kafedra-terapi%d1%97-farmakologi%d1%97-klinichno%d1%97-diagnostiki-taximi%d1%97/sklad-kafedri/dolbanosova-rimma-valentiniivna-k-vet-n-docent/ e- mail : rimma19-82@ukr.net		
9.	General description of the educational component	The discipline "Veterinary Toxicology" provides students with theoretical knowledge and practical skills for the prevention of adverse effects of toxic substances on animals, diagnosis of animal poisoning, modern methods of treatment of animals for their poisoning.		
10	The purpose of the educational component	To give students theoretical knowledge and practical skills on: a) safe and effective use of animal protection products; b) methods to prevent the negative impact of toxic substances on the farmed animals in including . birds, fish and bees; c) diagnosis of poisoning of animals with pesticides, feed additives, poisonous plants, mycotoxins. d) modern methods of treating animals for their poisoning; e) veterinary and sanitary examination in case of animal poisoning.		
11	Prerequisites for studying OK, the relationship with other educational components of OP	1. The educational component is based on: foreign and Latin language, physiology, biochemistry, clinical diagnostics, veterinary pharmacology, medicinal plants. 2. The educational component is ancillary to obstetrics and gynecology, animal reproduction, internal non-communicable diseases , infectious diseases , pathological anatomy .		
12	The policy of academic integrity	It is expected that applicants for higher education will adhere to the principles of academic integrity, aware of the consequences of its violation, as defined by the Code of Academic Integrity of Sumy National Agrarian University .		

2. LEARNING OUTCOMES FOR THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH SOFTWARE LEARNING RESULTS

OK learning outcomes: After studying the educational component, the student is expected to be able to... »	Program learning outcomes to be achieved by the OK (indicate the number according to the numbering given in the OP)								As estimated by RND
	PLO 2	PLO 3	PLO 4	PLO 5	PLO 7	PLO 10	PLO 15	PLO 18	
DRN 1. Use knowledge of the parameters of toxicometry (toxicodynamics and toxicokinetics) of toxic substances in the appointment of treatment and prevention . Take samples of pathological material, feed and water for chemical and toxicological studies. Detect and identify poisonous plants (perform botanical analysis) Prepare supporting documentation.		+	+	+			+	+	Simulation exercises. Work in groups with research material . Preparation of accompanying documents.
DRN 2. Use methods of isolation of toxic substances patmaterialu and feed through to know the primary s reactions interaction poison of tissue, the path along flow toxic to animals, absorption, distribution and deposition , the main stages of the biotransformation of poisons and ways of their elimination			+	+					Work on situational tasks

<p>DRN 3</p> <p>Use knowledge of the features of etiopathogenesis, symptoms and course of toxicoinfections for the appointment of etiotropic, pathogenetic, symptomatic and replacement therapy</p> <p>Be able to choose drugs for poisoning</p>		+	+	+		+			<p>Simulation exercises</p> <p>Solving situational problems</p> <p>Preparation of presentations on the topic</p>
<p>DRN4.</p> <p>Differentiate fungi - producers of mycotoxins on the basis of organoleptic and laboratory methods of feed quality assessment.</p>		+			+				<p>Multiple choice tests</p>
<p>DRN5.</p> <p>Analyze the results obtained after the appointment of treatment and prevention.</p> <p>Use the acquired knowledge for further therapeutic activities</p>		+	+		+	+			<p>Paperwork. In solving situational problems</p>

3. CONTENT OF THE EDUCATIONAL COMPONENT (PROGRAM OF THE COURSE)

Topic. List of issues to be addressed within the topic	Distribution within the general time budget			Recommended Books
	Classroom work		Himself. slave.	
	Lecture	Lab. with.		
<p>Topic 1. Introduction. Definition, content, tasks and objects of veterinary toxicology.</p> <ol style="list-style-type: none"> 1. The concept of poisons and poisoning. 2. Toxicometry parameters of toxic substances. 3. Classification of toxic substances. 4. General scheme and procedure of HTD. 5. Safety and labor protection when working in a chemical and toxicological laboratory. 6. Methods of detecting toxic substances in water, feed, parenchymal organs 	2/2	2/2	10/10	7, 8,14, 22, 26,27
<p>Topic 2. The essence of the effects of poisons on the body and the environment.</p> <ol style="list-style-type: none"> 1. Toxicodynamics and toxicokinetics . 2. Diagnosis and prevention of poisoning. 3. Treatment of animals for poisoning 4. Toxicology of herbicides. 	2/-	2/2	10/10	1-3, 5, 9, 11-17, 27
<p>Topic 3. Toxicology of organochlorine and organophosphorus compounds .</p> <ol style="list-style-type: none"> 1. Toxicological characteristics of organophosphorus compounds (FOS). 2. Toxicological characteristics of organochlorine compounds (HOS). 		2/2	10/10	4, 10, 11, 13-18,20,24-27
<p>Topic 5. Toxicological characteristics of urea, phenol, dipyridylum and fluorinated pesticides.</p>			20/20	2-4, 6, 10-12, 16-20, 24

1. Toxicological characterization of derivatives of carbamic acids and fenoksykyslot .				
Topic 7. Toxicological characteristics of compounds containing heavy metals. 1. Mercury toxicology 2. Lead toxicology 3. Toxicology of thallium 4. Arsenic poisoning			20/10	1, 3, 7, 8, 13, 26, 27
Topic 8. Toxicology of zoocides of different groups. 1. Toxicological characteristics of synthetic pyrethroids , 2. Toxicological characteristics of zoocides and fluoride.			10/10	4, 10, 11, 13-18,20,24-27
Topic 9. Toxicological characteristics of feed additives. 1. Chlorine and its compounds (table salt). 2. Toxicological characteristics of urea and ammonium salts. 3. Nitrate and nitrite poisoning			20/10	2-4, 6, 10-12, 16-20, 24
Topic 10 . Phytotoxicosis . Toxicological characteristics of plants containing alkaloids. Toxicological characteristics of plants containing various glycosides groups, coumarins , oxalates, photosensitizers , essential oils.			20/10	1,3, 5, 7, 8,14, 22, 26,27
Topic 11. Mycotoxicosis of animals. Fungi-producers of mycotoxins and their distribution. Influence of fungi and their metabolites on feed quality. Biological action of mycotoxins on animals. Classification of mycotoxicosis. Characteristics of aspergillosis and penicillin toxicosis . Characteristics of fusariotoxicosis. Mycotoxicosis of other groups.			20/22	7, 8, 10, 12, 14, 22, 26,27
In just one year	4/2	6/6	140/11 2	150/120

4. METHODS OF TEACHING AND TEACHING

DRN	Teaching methods (work to be done by the teacher <u>during classes</u> , consultations)	Number of hours	Teaching methods (what types of educational activities the <u>student must perform independently</u>)	Number of hours
<p>DRN 1.</p> <p>Use knowledge of the parameters of toxicometry (toxicodynamics and toxicokinetics) of toxic substances in the appointment of treatment and prevention.</p> <p>Take samples of pathological material, feed and water for chemical and toxicological studies. Detect and identify poisonous plants (perform botanical analysis)</p> <p>Prepare supporting documentation.</p>	<p><i>Informative lecture</i> where students receive ready-made information that needs to be memorized, <i>lecture visualization</i> - demonstration materials, forms of visualization, which not only supplement verbal information, but also act as carriers of meaningful information.</p> <p><i>Practical methods</i> - work with pathological material, food, water, plants.</p> <p><i>Problematic</i> - disputes based on lecture materials.</p> <p>Using the MOODLE, ZOOM platform during a mixed form of learning.</p>	2/2	<p><i>Extracurricular work</i> - reading literature on the topic, working with textbooks, manuals, materials on the Internet</p>	28/16
<p>DRN 2.</p> <p>Use methods of isolation of toxic substances from patmaterial and feed on the basis of knowledge of</p>	<p><i>Practical methods</i> - to get acquainted with the methods of isolation of toxic substances from the material, feed and water. P</p>	2/2	<p><i>Extracurricular work</i> - reading literature on the topic, watching videos, working with textbooks, manuals and</p>	28/24

<p>primary reactions of poison interaction with body tissues, ways of entering toxic substances into animals, absorption, distribution and deposition, main stages of biotransformation of poisons and ways of their removal</p>	<p>rovedennya research conditions and animal feed, fodder research in terms UNPK "vivarium" Official. Conducting a general examination of animals to identify clinical and subclinical stages of intoxication . <i>Problematic</i> - disputes over the received materials. Using the MOODLE, ZOOM platform during a mixed form of learning.</p>		<p>guidelines.</p>	
<p>DRN 3 Use knowledge of the features of etiopathogenesis , symptoms and course of toxicoinfections for the appointment of etiotropic , pathogenetic, symptomatic and replacement therapy Be able to choose drugs for poisoning</p>	<p><i>Lecture visualization</i> - demonstration materials, forms of clarity, which not only supplement verbal information, but also act as carriers of meaningful information. <i>L ektsiya-press konferentsyiya</i> offering students a writing teacher to ask questions about topics that will be explored. For two or three minutes, students formulate questions to</p>	<p>2/2</p>	<p><i>Extracurricular work</i> - Solving situational problems. Testing on the MOODLE platform</p>	<p>28/24</p>

	<p>involve students in the key moments of the course and systematization of knowledge, to determine the prospects for the development of the acquired content and pass them to the teacher . During the lecture, the teacher answers the questions.</p> <p><i>Work with animals</i>, where the main clinical manifestations of animal intoxication are understood and differential diagnosis is performed.</p> <p><i>Problematic</i> - disputes based on lecture materials.</p> <p>Using the MOODLE, ZOOM platform during a mixed form of learning.</p>			
<p>DRN4. Differentiate fungi - producers of mycotoxins on the basis of organoleptic and laboratory methods of feed quality assessment.</p>	<p><i>Lecture visualization</i> - demonstration materials, forms of visualization, which not only complement the verbal information, but also act as carriers of meaningful information.</p>	<p>2/2</p>	<p><i>Extracurricular work</i> - Reading material on the proposed topics. Watch videos with a theme , which are located on the MOODLE platform</p>	<p>28/24</p>

	<p><i>Problematic</i> - disputes based on lecture materials. Using the MOODLE, ZOOM platform during a mixed form of learning.</p>			
<p>DRN5. Analyze the results obtained after the appointment of treatment and prevention. Use the acquired knowledge for further therapeutic activities</p>	<p><i>Analytical method</i> - after the appointment of a protocol for the treatment of animal intoxications, an analysis of each prescribed drug and method of therapy is performed . <i>Q Republican konferentsiya</i> -C tvoryuyetsya problematic situation that encourages students to seek solution, step by step to raising purposes. <i>Working with animals</i> to observe animals being treated. Using the MOODLE, ZOOM platform during a mixed form of learning.</p>	2/-	<p>Extracurricular work - acquaintance with the existing protocols of treatment of animals for intoxications. Preparation presentations and reports on the topic.</p>	28/24

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1. Summative assessment

5.1.1. To assess the expected learning outcomes provided in the 8 th semester

No	Methods of summative evaluation	Points / Weight in the overall score	Date of compilation
1.	Thematic evaluation	10 points / 15 %	Up to 15 weeks
2.	Working with animals/ work with situational tasks in case of distance learning	20 points / 20 %	Up to 12 weeks
3.	Simulation exercises	20 points / 20%	Up to 14 weeks
4.	Preparation of accompanying documents and treatment protocols	20 points / 20%	Up to 14 weeks
5.	Presentations with reports	10 points / 10%	Up to 12 weeks
6.	Multiple choice tests	20 points / 15%	Weeks 6 ,12

5.1.2.To assess the expected learning outcomes provided in the 9 th semester

No	Methods of summative evaluation	Points / Weight in the overall score	Date of compilation
2.	Thematic evaluation	10 points / 15 %	Up to 15 weeks
3.	Working with animals/ work with situational tasks in case of distance learning	10 points / 20 %	Up to 12 weeks
4.	Simulation exercises	10 points / 20%	Up to 14 weeks
5.	Preparation of accompanying documents and treatment protocols	10 points / 15%	Up to 14 weeks
6.	Presentations with reports	15 points / 15%	Up to 12 weeks
7.	Multiple choice tests	15 points / 15%	Week 6
8.	Exam	30 points / 15%	Week 15

5.1.1. Evaluation criteria in the 5th semester

Component	Unsatisfactorily	Satisfactorily	Okay	Perfectly
Thematic evaluation	<3 points	4 -6	7-9 points	10 points
	Task	Most	All	All requirements

	requirements not met	requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	requirements of the task are fulfilled	of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Working with animals	<3 points	4 -6	7-9 points	10 points
	Task requirements not met	Most of the requirements are met, but there are minor violations of the methods	The task is done correctly	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Simulation exercises, drawing up protocols	<3 points	4 -6	7-9 points	10 points
	Task requirements not met	Most requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All requirements of the task are fulfilled, the situational task is solved completely, the report is made	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Preparation of accompanying documents and treatment protocols	<3 points	4 -6	7-9 points	10 points
	Task requirements not met	Most of the requirements are met, but there are minor violations of	The task is done correctly	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own

		the rules		solution of a problem is offered
Preparation of presentations and reports	<5 points	5-10	11-14	15
	Task requirements not met	The presentation is prepared, but the report is not clear, not logical	All the requirements of the task are met, the report and the presentation meet the requirements	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Testuvannya	<5 points	6-11	12-14	15
	Less than 5 correct answers	6-11 correct answers	12-14 correct answers	All correct answers
Exam	<15 балів	15-20	21-26	27-30
	Ticket issues are not disclosed	2 questions are solved	3 questions are solved	Three issues are revealed and the own solution of the problem is offered

5.2. Formative assessment:

№	Elements of formative assessment	Date
1.	Oral interview after studying the topics	15 minutes at the end of the lesson at the end of the study of the topic
2.	Oral feedback from the teacher while working on situational tasks during classes	next lesson after learning a new topic
3.	Oral feedback from the teacher and students after the presentation of independent work	12-14 weeks

6. LEARNING RESOURCES (LITERATURE)

Basic

1. Albretsen JC (2004) Methylxanthines. In *Clinical Veterinary Toxicology*, Plumlee KH (ed.). Mosby, St. Louis, pp. 322–326.
2. American Society of Health System Pharmacists (2003) *American Hospital Formulary Service Drug Information*. American Hospital Formulary Service, Bethesda, pp. 2421–2423.
3. Brown CM, Bertone J (2001) *The 5-Minute Veterinary Consult Equine*. Lippincott Williams & Wilkins, Philadelphia, pp. 816–817.
4. Connally HE, Hamar DW, Thrall MA (2002) Resident Forum Abstract from 8th IVECCS San Antonio, Texas. Safety and efficacy of high dose fomepizole as therapy for ethylene glycol intoxication in cats. *J Veter Emerg Crit Care* **12**: 191.
5. Crandell DE, Weinberg MD (2009) Moxidectin toxicosis in a puppy successfully treated with intravenous lipids. *J Veter Emerg Crit Care* **19**: 181–186.
6. Dalefield R (2004) Ethylene glycol. In *Clinical Veterinary Toxicology*, Plumlee KH (ed.). Mosby, St. Louis, pp. 150–154.
7. DeClementi C, Bailey KL, Goldstein SC, Orser MS (2004) Suspected toxicosis after topical administration of minoxidil in 2 cats. *J Veter Emerg Crit Care* **14**: 287–292.
8. Donnelly TM (2004) Rabbits. Basic anatomy, physiology, and husbandry. In *Ferrets, Rabbits, and Rodents Clinical Medicine and Surgery*, 2nd edn, Quesenberry KE, Carpenter JW (eds). Saunders, St. Louis, pp. 136–139.
9. Echols S (2005) Collecting diagnostic samples in avian patients. In *The Clinics Collection Veterinary Clinics of North America Exotic Animal Practice*, Rupley AE (ed.). W.B. Saunders Company, Philadelphia, pp. 60–63.
10. Gaddy J (2001) Pharm profile fomepizole. *Compend Contin Educ Pract Vet* **X**: 1073–1074.
11. Gwaltney-Brant S (2004) Amitraz. In *Clinical Veterinary Toxicology*, Plumlee KH (ed.). Mosby, St. Louis, pp. 177–178.

Auxiliary

12. Gwaltney-Brant SM, Rumbelha WK (2002) Newer antidotal therapies. *Vet Clin North Am Small Anm Prac* **32**: 323–339.
13. Horstman CL, Cornell KK, Eubig PA, Khan SA, Selcer BA (2003) Gastric outflow obstruction after ingestion of wood glue in a dog. *J Am Anim Hosp Assoc* **39**: 47–51.
14. Khan S, McLean MK, Hansen S, Luchinski D, Zawistowski S (2009) ASPCA Animal Poison Control Center uses its databases to study the efficacy and safety of three different emetics in dogs and cats utilizing 3R principles. Poster presented at 7th World Congress on Alternatives and Animal Use in the Life Sciences. Rome, Italy.
15. Knight AP (2004) Coumarin glycosides. In *Clinical Veterinary Toxicology*, Plumlee KH (ed.). Mosby, St. Louis, pp. 388–390.
16. Mathews KA (2006) *Veterinary Emergency and Critical Care Manual*. Lifelearn Inc., Guelph, pp. 4–8, 12–17, 85, 630–640, 655–659.

17. McConkey SE, Grant DM, Cribb AE (2009) The role of paraaminophenol in acetaminophen-induced methemoglobinemia in dogs and cats. *J Vet Pharmacol Therap* **32**: 585–595.
18. O'Brien TQ, Clark-Price SC, Evans EE, Di Fazio R, McMichael MA (2010) Infusion of a lipid emulsion to treat lidocaine intoxication in a cat. *J Am Vet Med Assoc* **237**: 1455–1458.
19. Oehme FW, Mannala S (2006) Paraquat. In *Small Animal Toxicology*, 2nd edn., Peterson ME, Talcott PA (eds). Elsevier Inc., St. Louis, pp. 964–977.

Information resources

20. Veterinary pharmacology and toxicology (research center)
http://ceninauku.ru/info/page_10474.htm
21. E-learning course: Veterinary Toxicology
(<http://vetmed.nauu.kiev.ua/course/view.php?id=41>)
22. Leight A.O. General toxicology . SPb .: ELBI - SPb., - 2006. S.224.
23. Scientific and educational portal: Veterinary pharmacology and toxicology
<http://originweb.info/science/codes/16/160004.html>

Methodical support

24. Dolbanosova RV Ulko LG, Kysterna OS Methodical recommendations for the implementation of laboratory and practical classes and independent work of the students of the Faculty of Veterinary Medicine « The basics of veterinary toxicology » . Sumy, 2019 .- 42 r .
25. Musienko VM, Ulko LG, Musienko OV, Kisterna OS Methodical instructions course of lectures on discipline "Veterinary toxicology". Sumy: Sumy National Agrarian University, 2016- 36 p.
26. Ulko LG, Dolbanosova RV, Shkromada OI Kisternaya OS Veterinary toxicology . Educational and methodical recommendations for independent and individual work of students of the Faculty of Veterinary Medicine on the subject " Veterinary Toxicology ". Sumy 2018 g ., P 52
27. Ulko LG, Dolbanosova RV, Shkromada OI Kisterna OS Phytotoxicosis of animals. Educational and methodical recommendations for independent and individual work of students of the Faculty of Veterinary Medicine in the discipline "Veterinary Toxicology" Sumy, 2017, 43 p.