Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of Higher Education
"St. Petersburg State University of Veterinary Medicine"

APPROVED BY
Vice-Rector for Educational
Work and Youth Policy
Sukhinin A.A.
April 10, 2026

Department of Pharmacology and Toxicology

EDUCATIONAL WORK PROGRAM

for the discipline

« TOXICOLOGY »

The level of higher education
SPECIALIST COURSE

Specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»
Full-time education
Education starts in 2026

Reviewed and adopted
at the meeting of the department
on April 10, 2026.
Protocol No. 13

Head of the Department
of Pharmacology and Toxicology
Candidate of Veterinary Sciences, Associate Professor
Lunegov A.M.

Saint Petersburg
2026

1. GOALS AND OBJECTIVES OF THE DISCIPLINE

The purpose of the discipline is to study the effect of toxic substances of anthropogenic and natural origin on the body of agricultural, wild and commercial animals, fish and bees, on their productivity, reproductive function and sanitary quality of livestock products. To achieve this goal, it is necessary to solve the following tasks:

to study: classifications of toxic substances by origin, degree of danger, effect on the body; to study methods for assessing the toxicity of drugs used in agriculture and veterinary medicine; features of the course of poisoning and principles of their diagnosis; rules for providing animals with different types of medical care for poisoning, taking into account the physico-chemical structure and action of toxic substances; principles of poisoning prevention toxic substances, plants, substandard feed, etc.; rules and regulations for sampling feed, water, pathological material, animal and plant products for chemical and toxicological analysis.

2. THE LIST OF THE PLANNED RESULTS OF THE DISCIPLINE (MODULE), CORRELATED WITH THE PLANNED RESULTS OF THE REALISED EDUCATIONAL PROGRAM

As a result of mastering the discipline, the student prepares for the following types of activities, in accordance with the educational standard of the FSE on 36.05.01 "Veterinary Medicine".

The field of professional activity:

13 Agriculture

2.1. The student's competencies formed (acquired) as a result of mastering the discipline

The education of the discipline should form the following competencies:

a) General professional competencies (GPC):

GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex

GPC -3 ID-3 - To possess skills of: the legal framework and ethical standards in the implementation of professional activities.

b) Professional competencies (PC):

PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.

PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.

PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period.

PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well.

PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques.

PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment.

PC-5 ID-6 - To know the state register of medicines for veterinary use.

PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology.

PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.

3. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF THE MPEP

Discipline B1.O.25.02 "Toxicology" is a discipline of Block 1 of the mandatory part of module B1.O.25 "Veterinary pharmacology and Toxicology" of the federal state educational standard of higher education in the specialty 36.05.01 "Veterinary Medicine" (specialty level). It is mastered in the A semesters in the 5rd year.

When teaching the discipline "Toxicology", the knowledge and skills acquired by students during the development of the disciplines of Animal Anatomy, Animal Physiology, Pathological Physiology, Biological Chemistry, Veterinary Pharmacology, Fundamentals of veterinary Pharmacy, Inorganic Chemistry, Organic Chemistry, Analytical Chemistry are used.

4. THE SCOPE OF DISCIPLINE AND TYPES OF ACADEMIC WORK

4.1. The scope of the discipline for full-time education

Type of educational work	Hours	Semesters
		A
Classroom classes (total)	**32**	**32**
Including:	-	-
Lectures, including interactive forms	8	8
Practical lessons (PL), including interactive forms, among which are:	24	24
practical training (PT)	4	4
Self-study	**40**	**40**
Type of intermediate and final certification (test, exam)	Test	Test
Total labor intensity hours/credits	**72/2**	**72/2**

5. THE CONTENT OF THE DISCIPLINE AND TYPES OF CLASSES
5.1. The content of the discipline (full-time education)

№	The title	Achieved competences	Semester	Types of academic work, including students' self-study and labor intensity (in hours)			
				Lectures	Practical lessons	Practical training	Self-study
1	The subject and objectives of veterinary toxicology. The concept of poisons and poisonings. Chemical and toxicological analysis. Regulatory and legal documentation.	***GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex:*** GPC -3 ID-3 - **To possess skills of:** the legal framework and ethical standards in the implementation of professional activities.	A	2	3	-	4
2	Poisoning with table salt and fluoride.	***PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.*** PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods. PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period. PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well. PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques. PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment. PC-5 ID-6 - To know the state register of medicines for veterinary use. PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology. PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.	A	-	2	1	4
3	Poisoning by nitrites and nitrates in animals.			2	2	1	4
4	Toxicology of heavy metals.		A	-	2	1	4
5	Toxicology of mycotoxicoses.		A	2	-	-	4
6	Toxicology of organophosphorus compounds, organochlorine compounds and dioxins.		A	-	3	-	4
7	Toxicology of rodenticides and pyrethroids.		A	-	3	-	4
8	Toxicology of poisons of animal origin.		A	-	2	1	4
9	Phytotoxicoses are poisonous plants.		A	-	2	1	4
10	Environmental toxicology.		A	2	-	-	4
		TOTAL FOR THE A SEMESTER		**8**	**20**	**4**	**40**

6. THE LIST OF EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' SELF WORK

6.1. Guidelines for self -work

1. Educational and methodical manual for practical classes in veterinary toxicology for full-time, part-time, and part-time students of the Veterinary Faculty / author-comp.: N. L. Andreeva [et al.]; Ministry of Agriculture of the Russian Federation, SPbGAVM. - Saint Petersburg : FSBEI HE SPbGAVM, 2019. - 59 p. - https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9NjY0JnBzPTYw (date of access: 10/04/2026) - Access mode: for authors. EB SPbGUVM users. - Text : electronic.

6.2. Literature for self-work

1. Martini-Johnson, Lisa. Applied Pharmacology for Veterinary Technicians / L. Martini-Johnson. - 6th Edition. - B.m. : Elsevier Inc, 2021. - 532 p. - https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MjEyMjUmcHM9NTYx (date of access: 10/04/2026) — Access mode: for authorization.SPbGUVM users.

7. THE LIST OF BASIC AND ADDITIONAL LITERATURE NECESSARY FOR THE EDUCATION OF THE DISCIPLINE

7.1. Basic literature

1. Lunegov, Alexander Mikhailovich. Veterinary pharmacology : guidelines for independent work on the performance of control work / A.M. Lunegov, V. A. Baryshev ; Ministry of Agriculture of the Russian Federation, St. Petersburg State Medical University. - St. Petersburg : Publishing House of SPbGUVM, 2021. - 43 p. https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9OTQ0JnBzPTQ0 (date of access: 10/04/2026) - Access mode: for authors. EB SPbGUVM users. - Text : electronic.

7.2. Additional literature

1. Amundson, Romich Janet. Fundamentals of Pharmacology for Veterinary Technicians / R. J. Amundson. - Trird edition. - B.m. : Cengage, 2020. - 942 p. - https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MjEyMzcmcHM9OTYz (date of access: 10/04/2026)

8.THE LIST OF RESOURCES OF THE INFORMATION AND TELECOMMUNICATION NETWORK "INTERNET" NECESSARY FOR EDUCATION OF THE DISCIPLINE

To prepare for laboratory classes and perform self-work, students can use the following online resources:

1. rlsnet.ru Encyclopedia of medicines and pharmacy products
2. Vidal.ru The Vidal Veterinarian Handbook
3. www.vetlek.ru
4. fsvps.gov.ru Rosselkhoznadzor
5. meduniver.com Medical Information Site

Electronic library systems

1. ELS "SPBGUVM"
2. Legal reference system "ConsultantPlus"
3. University information system "RUSSIA"
4. Full-text database POLPRED.COM
5. Scientific electronic Library ELIBRARY.RU
6. Russian Scientific Network
7. Full-text interdisciplinary database on agricultural and environmental sciences ProQuest AGRICULTURAL AND ENVIRONMENTAL SCIENCE DATABASE
8. Electronic books of the publishing house "Prospekt Nauki" http://prospektnauki.ru/ebooks/
9. Collection "Agriculture. Veterinary medicine" publishing house "Quadro" ELS "Elibris" publishing house "Quadro" https://elibrica.com/

9. METHODOLOGICAL GUIDELINES FOR STUDENTS ON EDUCATION OF THE DISCIPLINE

Methodological recommendations for students are a set of recommendations and explanations that allow them organize the process of studying this discipline optimally.

The content of methodological recommendations, as a rule, may include:

• Tips on planning and organizing the time needed to study the discipline. Description of the sequence of actions of the student, or the "scenario of studying the discipline".

Morning time is the most effective for academic work (from 8-14 hours), followed by afternoon time (from 16-19 hours) and evening time (from 20-24 hours). The most difficult material is recommended to be studied at the beginning of each time interval after rest. After 1.5 hours of work, a break is required (10-15 minutes), after 4 hours of work, the break should be 1 hour. Part of the scientific organization of labor is the master of the technique of mental labor. Normally, a student should devote about 10 hours a day to studying (6 hours at university, 4 hours at home).

The methodology of work when taking notes of oral presentations differs significantly from the methodology of work when taking notes of written sources.

By taking notes of written sources, the student has the opportunity to read again the desired passage of the text, reflect on it, highlight the main thoughts of the author, briefly formulate them, and then write them down. If necessary, he can also note his attitude to this point of view. Listening to the lecture, the student should transist most of the complexity of the above–mentioned works for another time, trying to use every minute to record the lecture, and not to comprehend it - there is no time left for this. Therefore, when taking notes of a lecture, it is recommended, to leave separate fields on each page for subsequent entries in addition to the summary.

After recording a lecture or making a summary of it, you should not leave work on the lecture material before preparing for the test. It is necessary to do as early as possible the work that accompanies takimg notes of written sources, the last could not be done during the recording of the lecture - read your notes, deciphering individual abbreviations, analyze the text, establish logical connections between its elements, in some cases show them graphically, highlight the main thoughts, mark issues, requiring additional processing, in particular, the teacher's consultations.

When working on the text of the lecture, the student should pay special attention to the problematic issues, raised by the teacher, during the lecture, as well as to his assignments and recommendations.

For each lecture, practical lesson and laboratory work, classification cod, topic, list of issues under consideration, volume in hours and links to recommended literature are provided. For classes conducted in interactive forms, its organizational form should be indicated: computer simulation, business or role-playing game, analysis of a specific situation, etc.

• Recommendations for preparing for practical classes

Practical (seminar) classes are an important part of the professional training of students. The main purpose of conducting practical (seminar) classes is to form students' analytical, creative thinking through the acquisition of practical skills. Practical classes are also conducted in order to deepen and consolidate the knowledge gained in lectures and in the process of independent work on normative documents, educational and scientific literature. For student, it is necessary, to study or repeat theoretical material on a given topic when preparing for a practical lesson for students.

When preparing for a practical lesson, the student is recommended to follow the following algorithm;

1) get acquainted with the plan of the upcoming lesson;

2) study the literature sources that have been recommended and familiarize yourself with the introductory notes to the relevant sections.

Methodological guidelines for practical (seminar) classes in the discipline, along with the work program and schedule of the educational process, refer to methodological documents that determine the level of organization and quality of the educational process.

The content of practical (seminar) classes is recorded in the working curricula of the disciplines in the sections "List of topics of practical (seminar) classes".

The most important component of any form of practical training are tasks. The basis of the task is an example that is understood from the standpoint of the theory developed in the lecture. As a rule, the main attention is paid to the formation of specific skills, which determines the content of students' activities - problem solving, laboratory work, clarification of categories and concepts of science, which are a prerequisite for correct thinking and speech.

• Practical (seminar) classes perform the following tasks:

- stimulate regular study of recommended literature, as well as attentive attitude to the lecture course;
- consolidate the knowledge gained in the process of lecture training and independent work on literature;
- expand the scope of professionally significant knowledge, skills, and abilities;
- allow you to verify the correctness of previously acquired knowledge;
- initiate skills of independent self-thinking, oral presentation;
- contribute to the free use of terminology;
-provide the teacher with the opportunity to systematically monitor the level of independent work of students.

Methodological guidelines for practical (seminar) classes on the discipline should be focused on modern business conditions, current regulatory documents, advanced technologies, the latest achievements of science, technology and practice, modern ideas about certain phenomena, the studied reality.

• Recommendations for working with literature.

Working with literature is an important stage of the student's self-work on mastering the subject, contributing not only to the consolidation of knowledge, but also to the expansion of horizons, mental abilities, memory, the ability to think, express and confirm personal hypotheses and ideas. In addition, the skills of research work necessary for further professional activityare developed.

When starting to study the literature on the topic, it is necessary to make notes, extracts, notes. It is mandatory to take notes of the works of theorists, which allow us to comprehend the theoretical basis of the study. For the rest, you can limit yourself to summary from the studied sources. All summaries and quotations must have the exact "return address" (author, title of the work, year of publication, page, etc.). It is advisable to write an abbreviated title of the question to which the extract or quotation refers. In addition, it is necessary to learn how to immediately compile a file of special literature and publications of sources, both proposed by the teacher and identified independently, as well as refer to bibliographic reference books, chronicles of journal articles, book chronicles, abstract journals. At the same time, publications of sources (articles,

book titles, etc.) should be written on separate cards, which must be filled in according to the rules of bibliographic description (surname, initials of the author, title of the work. Place of publication, publisher, year of publication, number of pages, and for journal articles – the name of the journal, year of publication, page numbers). On each card, it is advisable to record the thought of the author of the book or a fact from this book on only one specific issue. If the work, even in the same paragraph or phrase, contains more judgments or facts on another issue, then they should be written out on a separate card. The presentation should be concise, accurate, without subjective assessments. On the back of the card, you can make your own notes about this book or article, its content, structure, on which sources it is written, etc.

• Explanations about working with control and test materials for the course, recommendations for completing homework.

Testing allows you to determine whether the actual behavior of the program corresponds to the expected one by performing a specially selected set of tests. A test is the fulfillment of certain conditions and actions necessary to verify the operation of the function under test or part of it. Each question in the discipline must be answered correctly by choosing one option.

10. EDUCATIONAL WORK

As part of the implementation of the discipline, educational work is carried out to form a modern scientific worldview and a system of basic values, the formation and development of spiritual and moral, civil and patriotic values, a system of aesthetic and ethical knowledge and values, attitudes of tolerant consciousness in society, the formation of students' need for work as the first vital necessity, the highest value and the main way to achieve success in life, to realize the social significance of your future profession.

11. THE LIST OF INFORMATION TECHNOLOGIES USED IN THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS

11.1 Information technologies

For the educational process of the discipline is previewed the use of information technologies:

- practical classes using multimedia;
- interactive technologies (dialogues, collective discussion on various topics for realization a particular educational and professional task);
- interaction with students via e - mail;
- community work in the electronic information and educational environment of St. Petersburg State University: https://spbguvm.ru/academy/eios/

11.2. Software

The list of licensed and free- distributed software, including national programs

№	Technical and computer programs recommended by sections and topics of the program	License
1	MS PowerPoint	67580828
2	LibreOffice	free software
3	OS Alt Education	AAO.0022.00
4	ABIS " MARK-SQL"	02102014155
5	MS Windows 10	67580828
6	System Consult Plus	503/КЛ
7	Android OS	free software

12. THE MATERIAL AND TECHNICAL BASE NECESSARY FOR THE IMPLEMENTATION OF THE DISCIPLINE EDUCATIONAL PROCESS

The title of the discipline (module), practice in accordance with the curriculum	The title of special rooms and rooms for self-work	Equipment of special rooms and rooms for self-work
Veterinary Pharmacology	115 (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	Specialized furniture: desks, chairs, blackboard. Technical training facilities: multimedia projector, screen, computer. Visual aids and educational materials: pharmacological collection by groups of medicinal substances, herbarium of medicinal and poisonous plants, presentations on pharmacology
	211 (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	Specialized furniture: desks, chairs, blackboard. Technical training facilities: multimedia projector, screen, computer. Visual aids and educational materials: pharmacological collection by groups of medicinal substances, herbarium of medicinal and poisonous plants, presentations on pharmacology
	211A (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	Specialized furniture: desks, chairs, blackboard. Technical training facilities: multimedia projector, screen, computer. Visual aids and educational materials: pharmacological collection by groups of medicinal substances, herbarium of medicinal and poisonous plants, presentations on pharmacology
	313 (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	Specialized furniture: desks, chairs, blackboard. Technical means of training: multimedia projector, screen, computer, scales: laboratory, manual, calibration; torsion; dispenser; homogenizer; magnetic stirrer; thermostat; laboratory refractometer microscope; refrigerator, laboratory utensils, exhaust cabinet; Visual aids and educational materials: pharmacological collection by groups of medicinal substances, herbarium of medicinal and poisonous plants, presentations on pharmacology
	314 (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification	Specialized furniture: desks, chairs, blackboard. Technical means of training: multimedia projector, screen, computer, scales: laboratory, manual, calibration; torsion; dispenser; homogenizer; magnetic stirrer; thermostat; laboratory refractometer microscope; refrigerator, laboratory utensils, exhaust cabinet; Visual aids and educational materials: pharmacological collection by groups of medicinal substances, herbarium of medicinal and poisonous plants, presentations on pharmacology
	312 (196084, St. Petersburg, Chernihiv str., house 5) Educational laboratory of the department.	Specialized furniture: chairs, laboratory cabinets, laboratory tables Technical training tools: Sapop FC -128 copier), HP LJ 1022 printer; multimedia projector, portable screen, computer, scales: laboratory, manual, torsion; torsion; dispenser; homogenizer; distiller. magnetic stirrer; laboratory heater; thermostat; microscope; laboratory refractometer; refrigerator, laboratory utensils, educational dummy dog "Jerry".
	206 Large reading room (196084, St. Petersburg, Chernigovskaya str., 5) Room for self-work	Specialized furniture: tables, chairs Technical means of education: computers connected to the Internet and access to an electronic information and educational environment
	214 Small reading room (196084, St. Petersburg, Chernigovskaya str., 5) Room for self-work	Specialized furniture: tables, chairs

		Technical means of education: computers connected to the Internet and access to an electronic information and educational environment
	324 Information Technology Department (196084, St. Petersburg, Chernigovskaya str., 5) Room for storage and preventive maintenance of educational equipment	Specialized furniture: tables, chairs, special equipment, materials and spare parts for preventive maintenance of technical training facilities
	Box No. 3 Carpentry workshop (196084, St. Petersburg, Chernigovsaya str., 5) Room for storage and preventive maintenance of educational equipment	Specialized furniture: tables, chairs, special equipment, materials and spare parts for preventive maintenance of technical training facilities

Developer:

Head of the Department of Pharmacology and Toxicology,
Candidate of Veterinary Sciences, Associate Professor  Lunegov A.M.

Annex 1

Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of higher education
"Saint Petersburg State University of Veterinary Medicine"

Department of Department of Pharmacology and Toxicology

FUND OF ASSESMENT TOOLS
for the discipline
"TOXICOLOGY"

Level of higher education
SPECIALIST COURSE

Specialty 36.05.01 Veterinary medicine
Profile: «General clinical veterinary medicine»
Full-time education.

Education starts in 2026

Saint Petersburg
2026

1. PASSPORT OF THE FUND OF ASSESMENT TOOLS

№	Acquired competence	Assessed modules of a discipline	Assesment tool
1.	***GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex:*** GPC -3 ID-3 - **To possess skills of:** the legal framework and ethical standards in the implementation of professional activities.	The subject and objectives of veterinary toxicology. The concept of poisons and poisonings. Chemical and toxicological analysis. Regulatory and legal documentation.	Knowledge survey, tests
2.	***PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.*** PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods. PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period. PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well. PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques. PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment. PC-5 ID-6 - To know the state register of medicines for veterinary use. PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology. **PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.**	Poisoning with table salt and fluoride. Poisoning by nitrites and nitrates in animals. Toxicology of heavy metals. Toxicology of mycotoxicoses. Toxicology of organophosphorus compounds, organochlorine compounds and dioxins. Toxicology of rodenticides and pyrethroids. Toxicology of poisons of animal origin. Phytotoxicoses are poisonous plants. Environmental toxicology.	Knowledge survey, tests

List of assessment tools

№	Наименование оценочного средства	Краткая характеристика оценочного средства	Представление оценочного средства в фонде
1.	Seminar	A means of controlling the assimilation of educational material of a topic, section or sections of a discipline, organized as an educational activity in the form of an interview between a teacher and students	Questions on topics/sections of the discipline
2.	Test	A system of standardized tasks that allows you to automate the procedure for measuring the level of knowledge and skills of a student	The fund of test tasks

2. INDICATORS AND CRITERIA FOR ASSESSING COMPETENCIES AT VARIOUS STAGES OF ITS FORMATION, DESCRIPTION OF ASSESSMENT SCALES

Planned results of competency acquaired	The level of development				Assesment tool
	Unsatisfactory	Satisfactory	Good	Exellent	
GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex*:*					
GPC -3 ID-3 - To possess skills of: the legal framework and ethical standards in the implementation of professional activities.	Basic skills were not demonstrated when solving standard tasks, and gross errors occurred	There is a minimal set of skills for solving standard tasks with some shortcomings	Basic skills are demonstrated in solving standard tasks with some shortcomings	Demonstrated skills in solving Non-standard tasks without errors and shortcomings	Seminar, Test, Report, Control work
PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.					
PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.	Basic skills were not demonstrated when solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical tasks with minor errors have been solved, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks with minor errors have been solved, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all basic tasks have been solved with some minor flaws, and all tasks have been completed in full	Seminar, Test, Report, Control work
PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period.	Basic skills were not demonstrated when solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical tasks with minor errors have been solved, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks with minor errors have been solved, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all basic tasks have been solved with some minor flaws, and all tasks have been completed in full	Seminar, Test, Report, Control work
PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well.	Basic skills were not demonstrated when solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical tasks with minor errors have been solved, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks with minor errors have been solved, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all basic tasks have been solved with some minor flaws, and all tasks have been completed in full	Seminar, Test, Report, Control work
PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques	Basic skills were not demonstrated when solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical tasks with minor errors have been solved, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks with minor errors have been solved, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all basic tasks have been solved with some minor flaws, and all tasks have been completed in full	Seminar, Test
PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines,	The level of knowledge is below the minimum	The minimum acceptable level of knowledge, many gross mistakes were made	The level of knowledge in the volume corresponding	The level of knowledge in the volume corresponding to the	Seminar, Test, Report, Control work

instructions, manuals, rules of diagnosis, prevention and treatment.	requirements, gross errors have occurred		to the training program, several blunders were made	training program, without errors.	
PC-5 ID-6 - To know the state register of medicines for veterinary use.	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many gross mistakes were made	The level of knowledge in the volume corresponding to the training program, several blunders were made	The level of knowledge in the volume corresponding to the training program, without errors.	Seminar, Test, Report, Control work
PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology.	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many gross mistakes were made	The level of knowledge in the volume corresponding to the training program, several blunders were made	The level of knowledge in the volume corresponding to the training program, without errors.	Seminar, Test, Report, Control work
PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many gross mistakes were made	The level of knowledge in the volume corresponding to the training program, several blunders were made	The level of knowledge in the volume corresponding to the training program, without errors.	Seminar, Test, Report, Control work

3. A LIST OF CONTROL TASKS AND OTHER MATERIALS, NECESSARY FOR THE ASSESSMENT OF KNOWLEDGE, SKILLS AND WORK EXPERIENCE

3.1. Typical tasks for the current control of academic progress
3.1.1 Questions for seminar

Assessed modules of a discipline	Acquired competence (identification)	Questions on topics/modules of the discipline
The subject and objectives of veterinary toxicology. The concept of poisons and poisonings. Chemical and toxicological analysis. Regulatory and legal documentation.	***GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex:*** GPC -3 ID-3 - **To possess skills of:** the legal framework and ethical standards in the implementation of professional activities.	1. The subject and objectives of veterinary toxicology. 2. The concept of poisons and poisonings. 3. Classification of poisons. 4. The fate of poisons in the body. 5. The concept of toxicodynamics and toxicokinetics of poisons. 6. The main distinguishing features of intoxication. 7. Classification of poisoning. 8. Ways of ingestion of poisons into the animal's body and their importance for the development of intoxication. 9. Ways of excreting poisons from the animal's body. 10. Lifetime and postmortem diagnosis of poisoning. 11. Scheme of assistance in case of poisoning. 12. Antidote and symptomatic therapy for poisoning. 13. The regulatory framework for the diagnosis and treatment of animals. Rules for collecting and sending the material to the laboratory for chemical and toxicological analysis. 14. Requirements for the material under study. 15. The concept of cumulation and types of cumulation. 16. Conditions conducive to the manifestation of poison toxicity and their effect on the development and course of poisoning. 17. General preventive measures in case of poisoning.
Poisoning with table salt and fluoride. Poisoning by nitrites and nitrates in animals. Toxicology of heavy metals. Toxicology of mycotoxicoses. Toxicology of organophosphorus compounds, organochlorine compounds and dioxins. Toxicology of rodenticides and pyrethroids. Toxicology of poisons of animal origin. Phytotoxicoses are poisonous plants.	***PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.*** PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods. PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period. PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well.	1. Toxicology of table salt. 2. Poisoning with fluorinated compounds. 3. Toxicology of nitrates and nitrites. 4. Toxicology of carbamates. 5. Toxicology of the most dangerous heavy metals (mercury, lead, cadmium, copper, zinc and arsenic). 6. General characteristics of heavy metals. 7. Antidote and symptomatic therapy for poisoning. 8. Rules for collecting and sending the material to the laboratory for chemical and toxicological analysis. 9. Requirements for the material under study. 10. Substances of man–made origin are non-traditional sources of animal poisoning.

Environmental toxicology.	PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques. PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment. PC-5 ID-6 - To know the state register of medicines for veterinary use. PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology. PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.	11. Conditions conducive to the manifestation of poison toxicity and their effect on the development and course of poisoning. 12. Scheme of assistance in case of poisoning. 13. Routes of administration of drugs and their distribution in the body. 14. The concept of pesticides and their features. 15. Classification of pesticides (by purpose, origin and by the nature of penetration into the body of insects). 16. Sanitary and hygienic classification of pesticides. 17. The concept of cumulation and types of cumulation. 18. Toxicology of mineral fertilizers. 19. Substances of man–made origin are non-traditional sources of animal poisoning. 20. Conditions contributing to the manifestation of poison toxicity and their effect on the development and course of poisoning. 21. General preventive measures in case of poisoning. 22. The State Pharmacopoeia of the Russian Federation 23. The State information system in the field of veterinary medicine is approved by the Federal Service for Veterinary and Phytosanitary 24. Supervision 25. The toxicology of table salt. 26. Poisoning with fluorinated compounds. 27. Toxicology of nitrates and nitrites. 28. Toxicology of carbamates. 29. General characteristics of heavy metals. Toxicology of the most dangerous heavy metals (mercury, lead, cadmium, copper, zinc and arsenic). 30. Toxicology of carbamide and other feed additives. 31. Toxicology of organophosphorus compounds. 32. Toxicology of modern organochlorine compounds and dioxins. 33. Toxicological characteristics of pyrethroids and avermectins. 34. Toxicology of rodenticides (zoocides). 35. General characteristics of feed poisoning (cake, meal, pulp, potatoes and tops, etc.). 36. Measures of assistance in case of snake bites, insect stings and scorpions. 37. General characteristics of poisonous plants. 38. Poisonous plants containing alkaloids. 39. Poisonous plants containing glycosides. 40. Poisonous plants containing toxalbumin and saponins. 41. General characteristics of heavy metals. 42. Routes of administration of medicinal substances.

3.1.2 Test-questions

Competence assessment tests:
PC-5 Development of an animal treatment plan based on the established diagnosis and individual characteristics of animals, selection of necessary chemical and biological drugs for the treatment of animals, taking into account their combined pharmacological effect on the body.

Competence indicators:
PC-5ID-1 Be able to use specialized information databases when choosing animal treatment methods;
PC-5ID-2 Should be able to calculate the amount of medicines for the treatment of animals and the prevention of diseases with prescriptions for a certain period;
PC-5ID-z Should be able to calculate the amount of medicines for the treatment of animals and the prevention of diseases with prescriptions for a certain period, including using digital technologies;
PC-5ID-4 Should be able to inject drugs into the animal body in various ways;
PC-5ID-5 Should know the methods of drug treatment of sick animals and indications for their use in accordance with methodological guidelines, instructions, guidelines, rules for the diagnosis, prevention and treatment of animals;
PC-5ID-6 Know the state register of medicines for veterinary use;
PK-5ID-7 Should know the pharmacological and toxicological characteristics of medicinal raw materials, medicinal products of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiologies;
PC-5ID-8 Should know the technique of introducing medicinal substances into the animal's body by enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.

A CLOSED TYPE TASK
TASKS OF A COMBINED TYPE WITH A CHOICE OF ONE ANSWER FROM THE SUGGESTED OPTIONS

PC-5ID-1 Should be able to use specialized information databases when choosing animal treatment methods

Task 1
Read the text and choose the correct answer.
Which order of the Ministry of Agriculture of the Russian Federation contains information on the procedure for prescribing prescription antimicrobials for veterinary use?
1. No. 776 dated 11/22/2022;
2. No. 426 dated July 29, 2020;
3. No. 353 dated April 10, 2023;
4. No. 648 dated 07/27/2023.
Answer: 1.

Task 2
Read the text and choose the correct answer.
What regulatory document regulates the rules for handling medicines?
1. No. 776 dated 11/22/2022;
2. No. 426 dated July 29, 2020;
3. No. 353 dated April 10, 2023;
4. No. 61 dated 04/12/2010

Answer: 4.

Task 3
Read the text and choose the correct answer.
To unify the naming of drugs, manufacture, and establish uniform mandatory methods for determining the quality of efficacy and activity, collections are being compiled called
1. Collections with instructions for the use of the drug;
2. Collection of a veterinarian;
3. The State Pharmacopoeia;
4. Medical reference book.
Answer: 3.

Task 4
Read the text and choose the correct answer.
Which standard applies to harmful substances contained in raw materials, products, intermediates and industrial waste, and establishes general safety requirements for their production, use and storage?
1. GOST 12.1.007-79;
2. GOST 12.1.007-76;
3. GOST 12.1.007-77;
4. GOST 12.1.007-78.
Answer: 2.

Task 5
Read the text and choose the correct answer.
Define what the state register of medicines is.
1. This is a list of domestic and foreign medicines, medical, preventive and diagnostic products registered by the Ministry of Agriculture of the Russian Federation;
2. The main regulatory document, a collection of standards and regulations that defines the quality indicators of medicinal substances manufactured in the Russian Federation and preparations made from them;
3. This is a set of basic criteria that medicines in a certain category must meet.;
4. A regulatory document that contains rules, norms and conformances to the manufacturing process of products, as well as their transportation and storage.
Answer: 1.

CLOSED-TYPE COMPLIANCE ASSIGNMENTS

PC-5ID-5 To know the methods of drug treatment of sick animals and indications for their use in accordance with the guidelines, instructions, guidelines, rules of diagnosis, prevention and treatment of animals;

Task 6
Read the text and make a match.
Poisoning is a disease caused by poison. Unlike most non-infectious and infectious diseases, animal poisoning is characterized by the following features: sudden onset of intoxication with an acute course and relatively rapid death of animals; massive intoxication occurring with the same clinical signs and pathological changes; intoxication manifests itself either immediately after feeding or in the first hours after feeding; body temperature is within the normal range or lowered; symptoms are disorders of the gastrointestinal tract, cardiovascular system and nervous system.

Name		Pathogenesis	
А	Salt poisoning	1	Pronounced dermatocrotic and general toxic effects on the central nervous system and the hematopoietic system. Blood vessels are affected, and blood clotting decreases.
Б	Poisoning with arsenic-containing compounds	2	It disrupts oxidative processes and tissue respiration, binds sulfhydryl groups of thiol enzymes, reduces the tone of the walls of blood vessels and capillaries, which leads to a drop in blood pressure and a weakening of cardiovascular activity.
В	Poisoning with zoocides	3	Under the action of the enzyme urease, it is broken down to ammonia and carbonic acid. The formed ammonia, being absorbed into the blood, slows down redox processes, blocks the tricarboxylic cycle, the Krebs oxidative cycle, which disrupts the function of the nervous system.
Г	Poisoning with stachyobothriotoxin	4	It disrupts the synthesis of vitamin K, prothrombin and other coagulating factors, which causes extensive bleeding. Pronounced irritant effect on mucous membranes, paralysis of the respiratory and vasomotor centers.
Д	Carbamide poisoning (urea)	5	Local irritation of the mucous membranes, which is accompanied by gastroenteritis. Being absorbed into the blood, osmotic pressure in the tissues is disrupted; the ionic balance in the blood displaces potassium from red blood cells, which leads to oxygen starvation.

Answer: А5, Б2, В4, Г1, Д3.

Task 7

Read the text and make a match.

Poison is a substance that, in doses even small relative to body weight, leads to disruption of the vital functions of the body: poisoning, intoxication, diseases and pathological conditions, and deaths. In industry, poisons are called toxicants. Poisons of biological origin are called toxins. Establish a correspondence, if the nature of the poison is known, with which solution the stomach is washed purposefully.

The nature of poisoning		Washing solution	
А	Poisoning with plant poisons and heavy metal salts	1	1% sodium thiosulfate solution
Б	Poisoning with barium preparations	2	10% calcium chloride solution
В	Poisoning with nitrates and nitrites	3	1-2% magnesium oxide solution
Г	Shipping with heavy metal salts	4	10-15% activated carbon suspension
Д	Poisoning with fluorinated compounds	5	0.1% potassium permanganate solution

Answer: А4, Б1, В5, Г3, Д2.

Task 8

Read the text and make a match.

Antidotes are prescribed only with an accurate diagnosis! According to the mechanism of action, antidotes are divided into 4 groups: direct or contact action, parenteral action, biochemical action and antidotes of pharmacological antagonism. Establish compliance with antidote therapy for poisoning.

The nature of poisoning		The antidote	
А	Poisoning with cyanides, nitrates, nitrites and selenium	1	Sodium thiosulfate
Б	Poisoning with organochlorine compounds	2	Methylene Blue
В	Poisoning with phenols and cresols	3	Vitamin K
Г	Poisoning with cardiac glycosides, hellebore	4	Tocopherol Acetate
Д	Отравление зоокумарином и его производными	5	Potassium chloride

Answer: А1, Б4, В2, Г5, Д3.

Task 9

Read the text and make a match.

The main components of animal poisons are proteins, many of which are enzymes and polypeptides. They have a complex chemical structure and occur in various combinations in different species of venomous animals. Establish compliance with emergency care for poisoning with poisons of animal origin.

Poisoning		The rate of poisoning	
А	When bitten by a cobra	1	Moisten the affected area with ether, alcohol, and apply cold. In case of multiple subcutaneous lesions, epinephrine hydrochloride, diphenhydramine.
Б	Stinging of bees, wasps, bumblebees	2	Treat the lesion site with vegetable oil. Prick around with 0.55 novocaine solution. Subcutaneously 0.15 solution of atropine sulfate, intramuscularly 0.5% solution of fentanyl.
В	Scorpion sting	3	Suck out the poison, intravenously 5% glucose solution with prednisolone, intramuscularly specific serum, 0.5% proserin solution and 0.15 atropine sulfate solution.
Г	Karakurt bites	4	Intravenously, calcium chloride or magnesium sulfate. Administration of a specific serum.

Answer: А3, Б1, В2, Г4

Task 10

Read the text and make a match.

Poison is a substance that, in doses even small relative to body weight, leads to disruption of the vital functions of the body: poisoning, intoxication, diseases and pathological conditions, and deaths. In industry, poisons are called toxicants. Poisons of biological origin are called toxins. Establish a correspondence between the abbreviated name and the corresponding definitions: for each position of the first column, select the corresponding position from the second column.

Letter abbreviation		Definition	
А	Lim ac	1	approximate safe level of the substance in the air in mg/m3
Б	$ЛД_{50}$	2	the minimum threshold dose of a toxic substance in mg / kg with a single oral or subcutaneous injection, which causes disorders of the body's vital activity in animals that go beyond adaptive physiological reactions
В	ОБУВ	3	the average lethal dose of a toxic substance in mg/ kg, which causes the death of 50% of animals with a single oral or subcutaneous injection during a 2-week follow-up
Г	$ПК_{хр}$	4	permissible concentrations of harmful substances in fishery reservoirs that do not adversely affect the regime of reservoirs, do

			not disrupt the normal functioning and reproduction of beneficial aquatic organisms, and do not pose a risk of accumulation of toxic substances in reservoir facilities.
Д	ПДК	5	the threshold concentration of chronic action, established in laboratory animals with prolonged repeated exposure in a chronic experiment, mg/ l

Write down the selected numbers under the corresponding letters in the table.

А	Б	В	Г	Д

Answer: А2, Б3, В1, Г5, Д4.

CLOSED-TYPE TASKS FOR ESTABLISHING THE SEQUENCE

PC-5ID-7 Should know the pharmacological and toxicological characteristics of medicinal raw materials, medicinal products of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiologies.

Task 11
Read the text and set the sequence.
Toxicokinetics is a branch of toxicology that examines the ways in which harmful substances enter the body, their transport and distribution, biotransformation and excretion. Establish the sequence of stages of toxicokinetics.
1. Distribution;
2. Metabolism;
3. Absorption;
4. Withdrawal.
Answer: 3,1,2,4.

Task 12
Read the text and set the sequence.
Fluorine is widespread in nature. The danger is represented by fluorine, which is found in significant quantities in phosphorous fertilizers. In what order does poisoning with fluoride and its compounds occur in the body?
1. Mineral metabolism is disrupted;
2. Blocks enzyme activity;
3. Absorbed into the blood;
4. Fluorine ions bind calcium, phosphorus, and magnesium ions.
Answer: 3,4,1,2.

Task 13
Read the text and set the sequence.
Arsenic has all the properties characteristic of heavy metals. Inorganic arsenic compounds, which have been widely used in agriculture to control crop pests (the first generation of pesticides), have been banned in agriculture in our country since 1968. In what order does poisoning with arsenic and its compounds occur in the body?
1. Inhibits oxidative processes;
2. Causes capillary paralysis;
3. Blocks sulfhydryl groups;
4. Accumulates pyruvic and lactic acid in the tissues.
Answer: 3,1,4,2.

Task 14
Read the text and set the sequence.
Nitrates – salts of nitric acid (saltpeter) are widely used in agriculture as nitrogen fertilizers. Nitrites are not used in agriculture, they are formed in nitrate feeds during careless storage; they can accumulate in plants under unfavorable conditions (drought, frost, heavy dew, etc.); in root crops, especially those exposed to mold, rotting; in ice cream – during slow thawing. The source of poisoning may be boiled root vegetables along with a warm decoction or slow cooling. In what sequence in the digestive tract (in ruminants in the rumen) nitrites are reduced to ammonia according to the scheme.
1. Hyponitrite;
2. Nitrate;
3. Nitrite;
4. Ammonia;
5. Hydroxylamine.
Answer: 2,3,1,5,4.

Task 15
Read the text and set the sequence.
Toxicokinetics is a branch of toxicology that examines the ways in which harmful substances enter the body, their transport and distribution, biotransformation and excretion. What is the sequence of one of the stages of absorption - pinocytosis?:
1. Migration of the vesicle into the protoplast, organelle or outside;
2. Adsorption of non-membrane molecules of substances;
3. Dissolution of the vesicle membrane (under the action of an enzyme) or simply its rupture;
4. Indentation or protrusion of the membrane, the formation of a pinocytic vesicle and its separation from the membrane with the expenditure of ATP energy.
Answer: 2,4,1,3.

OPEN-TYPE ASSIGNMENTS

PC-5ID-2 Should be able to calculate the amount of medicines for the treatment of animals and the prevention of diseases with prescriptions for a certain period

Task 16
Read the text and give a detailed, reasoned answer.
With excessive intake of sodium chloride into the body, local irritation of the mucous membranes occurs, which is accompanied by gastroenteritis. Being absorbed into the blood, it disrupts osmotic pressure in tissues; ion balance in the blood and displaces potassium from red blood cells, which leads to oxygen starvation. Help the injured animal. Write out the recipe:
A cow (500 kg). Calcium chloride intravenously, 2 times a day for 3 days (100 ml bottle). The dose is 0.5 ml/kg.

A cow (500 kg)
Rp.: Solutionis Calcii chloridi sterilisatae 10%-100 ml
D.t.d. №24
S. Intravenously slowly, 250 ml., 2 times a day. The course lasts 3 days.

PC-5ID-3 Should be able to calculate the amount of medicines for the treatment of animals and the prevention of diseases with prescriptions for a certain period, including using digital technologies.

Task 17

Read the text and give a detailed, reasoned answer.

Poisons of animal origin affect the nervous system, leading to paralysis, or the blood, causing it to clot or bleed profusely. When ingested, the poison primarily has a local effect, and as it is absorbed, its general effect on the body also affects. In some cases, the local effect is very strong, and the general effect is weak (bee sting), in others — on the contrary (cobra bite). The local effect is manifested in swelling in the bite area, severe pain, blistering, tissue destruction (necrosis), etc. The overall effect usually affects the nervous system, cardiovascular system, etc. and manifests itself in paralysis of the heart, respiratory center, kidney inflammation, blood clotting, etc., which sometimes leads to death. Help the injured animals. Write out the recipes:

A dog (10 kg). Promedol intramuscularly for snake bite (amp. 1%- 1ml). The dose is 0.0002 g/kg.

A dog (10 kg).

Rp.: Solutionis Promedoli 1%-1 ml
D.t.d. №10 in ampullis
S. Intramuscularly, 0.2 ml once, for snake bite.

Task 18

Read the text and give a detailed, reasoned answer.

It is necessary to produce a less concentrated solution by volumetric method after preliminary calculation according to the formula.

Task: prepare 100 ml of 70% ethyl alcohol solution from 96% ethyl alcohol, give a detailed answer, with calculations and indicating the formula used. Write a prescription for a pharmacy.

Answer: $\frac{\text{required concentration x required volume}}{\text{initial concentration}}$ =

= volume (initial concentration) or $\frac{70\% \times 100 \text{ ml}}{96\%} = 72{,}9 \text{ ml}$

Rp.: Spiritus aethylici 96% -72,9 ml
Aquae destillatae ad 100 ml
M.f. solutio
S. For the pharmacy.

PC-5ID-4 Should be able to inject drugs into the animal body in various ways

Task 19

Read the text and give a detailed, reasoned answer.

Prescribe a sodium bromide solution for 4 days in such a way that, by prescribing it orally in 1 tablespoon, the patient receives 0.4 g of the substance. Apply the solution 1 tablespoon 3 times a day. Give a detailed answer and write out a prescription.

Answer:

Solutions for internal use are prescribed underdosed. Simple recipes can be written out in detail and abbreviated.

Calculation of the concentration of the solution as a percentage: 1 tablespoon (20 ml) contains 0.4 g of the substance,

20 мл – 100%, that is, the solution will be 2%

0,4 g - x%

Calculation of the amount of solution: for one dose, 20 ml of solution x 3 times a day x 4 days. Total 240 ml.

Rp.: Solutionis Natrii bromidi 2% - 240 ml
D.S. Inside, 1 tablespoon, 3 times a day.

PC-5ID-6 Know the state register of medicines for veterinary use

PC-5ID-7 Should know the pharmacological and toxicological characteristics of medicinal raw materials, medicinal products of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiologies

PC-5ID-8 Should know the technique of introducing medicinal substances into the animal's body by enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.

Task 20
Continue the offer... In case of poisoning with nitrates and nitrites of cattle, the following drugs are used as symptomatic treatment, indicating the method of administration.....
Answer: as a symptomatic treatment for poisoning with nitrates and nitrites, a 10% aqueous sugar solution with the addition of 1% acetic acid (KRS) is injected into the scar. In severe cases, cordiamine and cititon are prescribed subcutaneously. If possible, rinse the stomach with 0.1% potassium permanganate solution.

3.1.3. Exam questions

The competence achieved:

GPC-3 Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex:

GPC -3 ID-3 To possess skills of: the legal framework and ethical standards in the implementation of professional activities.

1. The subject and objectives of veterinary toxicology.
2. The concept of poisons and poisonings.
3. Classification of poisons.
4. The fate of poisons in the body.
5. The concept of toxicodynamics and toxicokinetics of poisons.
6. The main distinguishing features of intoxication.
7. Classification of poisoning.

PC-5 To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.

PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.

1. Information databases of medicines for animals.
2. Dosage forms of medicines
3. Types of action of medicinal substances.
4. Sources and ways of obtaining medicinal substances.
5. The ways in which poisons enter the animal's body and their importance for the development of intoxication.
6. Ways of excreting poisons from the animal's body.
7. Lifetime and postmortem diagnosis of poisoning.

PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period.

1. Antidote and symptomatic therapy for poisoning.
2. Rules for collecting and sending the material to the laboratory for chemical and toxicological analysis.
3. Requirements for the material under study.
4. Substances of man–made origin are non-traditional sources of animal poisoning.
5. Conditions conducive to the manifestation of poison toxicity and their effect on the development and course of poisoning.

PC-5 ID-3 - To be able to calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well.

1. The scheme of assistance in case of poisoning.

PC-5 ID-4 - To be able to administer drugs to the animals body in various techniques.

1. Routes of administration of drugs and their distribution in the body.

PC-5 ID-5 - To know the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment.

1. The concept of pesticides and their features.
2. Classification of pesticides (by purpose, origin and by the nature of penetration into the body of insects).
3. Sanitary and hygienic classification of pesticides.
4. The concept of cumulation and types of cumulation.
5. Toxicology of mineral fertilizers.
6. Substances of man–made origin are non-traditional sources of animal poisoning.
7. Conditions conducive to the manifestation of poison toxicity and their effect on the development and course of poisoning.
8. General preventive measures in case of poisoning.

PC-5 ID-6 - To know the state register of medicines for veterinary use.

1. The State Pharmacopoeia of the Russian Federation
2. The State information system in the field of veterinary medicine is approved by the Federal Service for Veterinary and Phytosanitary Supervision

PC-5 ID-7 - To know the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology.

1. Toxicology of table salt.
2. Poisoning with fluorinated compounds.
3. Toxicology of nitrates and nitrites.
4. Toxicology of carbamates.
5. General characteristics of heavy metals. Toxicology of the most dangerous heavy metals (mercury, lead, cadmium, copper, zinc and arsenic).
6. Toxicology of carbamide and other feed additives.

7. Toxicology of organophosphorus compounds.
8. Toxicology of modern organochlorine compounds and dioxins.
9. Toxicological characteristics of pyrethroids and avermectins.
10. Toxicology of rodenticides (zoocides).
11. General characteristics of feed poisoning (cake, meal, pulp, potatoes and tops, etc.).
12. Measures of assistance in case of snake bites, insect stings and scorpions.
13. General characteristics of poisonous plants.
14. Poisonous plants containing alkaloids.
15. Poisonous plants containing glycosides.
16. Poisonous plants containing toxalbumin and saponins.
17. General characteristics of heavy metals.

PC-5 ID-8 - To know the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.

1. Routes of administration of medicinal substances.

Note: To present the material according to the following scheme:
- sources of poisoning;
- toxicodynamics of the poison;
- symptoms of poisoning;
- diagnosis (lifetime and postmortem);
- treatment and prevention.

4. METHODOLOGICAL MATERIALS DEFINING THE PROCEDURES FOR ASSESSING KNOWLEDGE, SKILLS AND ABILITIES AND WORK EXPERIENCE CHARACTERIZING THE STAGES OF COMPETENCE FORMATION

4.1. Criteria for evaluating students' knowledge during the knowledge survey

Mark "**excellent**" - the student clearly expresses his point of view on the issues under consideration, giving appropriate examples.

Mark "**good**" - the student admits some errors in the answer

The mark «**satisfactory**" - the student discovers gaps in knowledge of the basic educational and normative material.

The mark "**unsatisfactory**" - the student discovers significant gaps in knowledge of the basic provisions of the discipline, the inability to obtain the correct solution to a specific practical problem with the help of a teacher.

4.2. Criteria for evaluating students' knowledge during testing

The test result is evaluated on a percentage rating scale. Each student is offered a set of test tasks of 25 questions:

The mark "**excellent**" is 25-22 correct answers.

The mark "**good**" is 21-18 correct answers.

The mark "**satisfactory**" is 17-13 correct answers.

The mark "**unsatisfactory**" is less than 13 correct answers

4.3. Criteria of knowledge during the test

The mark "**accepted** " must correspond to the parameters of any of the positive ratings ("excellent", "good", "satisfactory").

The mark "**not accepted** " rating should correspond to the parameters of the "unsatisfactory" rating.

The mark "excellent" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed.

The mark "good" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be made.

Mark "satisfactory" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills is manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations. –

The mark «unsatisfactory" – the types of educational work provided for in the curriculum have not been completed. demonstrates incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge, skills, and skills is manifested for a large number of indicators, the student experiences significant difficulties in operating knowledge and skills when transferring them to new situations

4.4. Criteria of knowledge during the examination

The mark "excellent" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in various situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed. –

The mark "good" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations can be made.

Mark "satisfactory" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills are manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations.

The mark "unsatisfactory" – the types of educational work provided for in the curriculum have not been completed. demonstrate incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge, skills, and skills are manifested for a large number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations.

5. ACCESSIBILITY AND QUALITY OF EDUCATION FOR DISABLED PEOPLE

If necessary, persons with disabilities and persons with disabilities are given additional, time to prepare an answer for the test.
When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities, their own technical means can be used.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline provides for the provision of information in forms adapted to the limitations of their health and perception of information:

For people with visual impairments:	– in printed form in enlarged font; – in the form of an electronic document.
For people with hearing impairments:	– in printed form; – in the form of an electronic document.
For people with disorders of the musculoskeletal system:	– in printed form, the device; – in the form of an electronic document.

When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline, it ensures that the following additional requirements are met, depending on the individual characteristics of the students:

a) instructions on the procedure for conducting the assessment procedure are provided in an accessible form (orally, in writing);

b) an accessible form of assignment of assessment tools (in printed form, in printed form in enlarged font, in the form of an electronic document, assignments are read out by the teacher);

c) an accessible form of providing answers to tasks (written on paper, a set of answers on a computer, orally).

If necessary, for students with disabilities and the disabled, the procedure for evaluating the results of training in the discipline can be carried out in several stages.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities is allowed using distant learning technologies.

Program abstract of the discipline
B1.O.25.02 "Toxicology"
specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»

The purpose of the discipline is to study the effect of toxic substances of anthropogenic and natural origin on the body of agricultural, wild and commercial animals, fish and bees, on their productivity, reproductive function and sanitary quality of livestock products.

The place of discipline in the curriculum: B1.O.25.02 compulsory discipline of the B1.O.25 module "Veterinary pharmacology and toxicology", mastered: full-time - in semester A in the 5th year.

Requirements for the results of mastering the discipline: The study of the discipline should form the following competencies:

GPC-3. Is able to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex:

GPC -3 ID-3 - **To possess skills of:** the legal framework and ethical standards in the implementation of professional activities.

PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character ristics, signature of necessary remedies of chemical and biological nature for the treatment, taking into account combination of its pharmacological effect on the animal body.

PC-5 ID-1 - **To be able to** use specialized information databases at a choice of animal treatment methods.

PC-5 ID-2 - **To be able to** calculate the amount of remedies for the treatment of animals and the prevention of diseases with the receipts signature for a certain period.

PC-5 ID-3 - **To be able to** calculate the amount of remedies for the treatment of animals and for the prevention of diseases with the receipts signature for a certain period, using digital technologies as well.

PC-5 ID-4 - **To be able to** administer drugs to the animals body in various techniques.

PC-5 ID-5 - **To know** the methods of pharmacological treatment of sick animals and indications for its administration, in accordance with the guidelines, instructions, manuals, rules of diagnosis, prevention and treatment.

PC-5 ID-6 - **To know** the state register of medicines for veterinary use.

PC-5 ID-7 - **To know** the pharmacological and toxicological characteristics of medicinal raw materials, remedies of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiology.

PC-5 ID-8 - **To know** the ways of drug injections, used both for animals enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods.

Summary of the discipline: In order to achieve this goal, it is necessary to study: classification of toxic substances by origin, degree of danger, effect on the body; to study methods for assessing the toxicity of drugs used in agriculture and veterinary medicine; features of the course of poisoning and principles of their diagnosis; rules for providing animals with different types of medical care for poisoning.

As a result of mastering the discipline, the student must:

To know: methods of drug treatment of sick animals and indications for their use in accordance with methodological guidelines, instructions, manuals, rules for diagnosis, prevention and treatment of animals; the state register of medicines for veterinary use; pharmacological and toxicological characteristics of medicinal raw materials, medicinal products of chemical and biological nature, biologically active additives for the prevention and treatment of animal diseases of various etiologies; the technique of drug administration substances into the animal's body by

enteral (oral, sublingual and rectal administration) and parenteral (injections, inhalations and skin applications) methods

Be able to: use specialized information databases when choosing methods of animal treatment; calculate the number of medicines for animal treatment and disease prevention with prescriptions for a certain period; calculate the number of medicines for animal treatment and disease prevention with prescriptions for a certain period, including using digital technologies; inject medicines into the animal body in various ways in ways.

Possess: Possess the legal framework and ethical standards in the implementation of professional activities

The total labor intensity of the discipline is: 72 academic hours (2 credits).

Final control of the discipline: test