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

« BASICS OF VETERINARY PHARMACY»

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 theoretical foundations of technological processes for the production and processing of medicinal substances into therapeutic, preventive, rehabilitative diagnostic drugs in the form of various dosage forms, as well as to develop practical skills and skills for conducting pharmaceutical quality control of medicines and finished dosage forms manufactured in a pharmacy.

To achieve this goal, it is necessary to solve the following tasks:

- to study the methods of obtaining medicinal substances;
- to study the technological process of manufacturing various dosage forms in pharmacy and industrial production.
- to study the main stages and features of pharmaceutical analysis of medicinal substances;
- to study the regulatory requirements for the quality of dosage forms;
- to study the methods of quality control of dosage forms and their storage conditions.

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) 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-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.

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

Discipline B1.V.20 "Basics of veterinary pharmacy" is a discipline of Block 1 of the part formed by participants in educational relations of the federal state educational standard of higher education in the specialty 36.05.01 "Veterinary Medicine" (specialty level).

Mastered in the 5th semester; in the 3rd year.

When teaching the discipline "Fundamentals of Veterinary Pharmacy", the knowledge and skills acquired by students during the development of the disciplines of Biological Chemistry; Biological Physics, Organic, physical and colloidal chemistry; Inorganic and analytical Chemistry are used.

The discipline "Fundamentals of Veterinary Pharmacy" is the basic one on which subsequent disciplines are based, such as: Veterinary Pharmacology, Toxicology.

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
		5
Classroom classes (total)	**32**	**32**
Including:	-	-
Lectures, including interactive forms	16	16
Practical lessons (PL), including interactive forms, among which are:	16	16
practical training (PT)	4	4
Self-study	**40**	**40**
Report	+	+
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 history of pharmacy. Stability and shelf life of medicinal substances. General questions of formulation in pharmacology, terminology. Laboratory equipment of the pharmacy. Dosage of dosage forms.	***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-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.	5	2	2		5
2.	Technology for the manufacture of solid dosage forms (powders, tablets, pills, granules)		5	2	1	1	5
3.	Technology of soft dosage forms (ointments, pastes, liniments, suppositories, porridges, boluses).		5	2	1	1	5
4.	Technology of liquid dosage forms (solutions, suspensions, emulsions, infusions, decoctions, tinctures, extracts, medicines).		5	2	1	1	5
5.	Pharmaceutical methods of analysis.		5	2	2		5
6.	Analysis of inorganic medicines (groups VI and VII of the periodic table of chemical elements of Mendeleev D.I.).		5	2	1	1	5
7.	Analysis of organic medicines (aldehydes, ketones, alcohols and halogens).		5	2	2		5
8.	Analysis of highly active BAS (alkaloids and glycosides).		5	2	2		5
		TOTAL FOR THE 5TH SEMESTER		**16**	**12**	**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 pharmaceutical chemistry for full-time and part-time students of the veterinary Faculty / author-comp.: N. L. Andreeva [et al.]; SPbGAVM. - St. Petersburg : SPbGAVM, 2017. - 65 p. - Text : electronic. — URL: UMP on pharmaceutical chemistry. - https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MjIzJnBzPTI0 (date of access: 10/04/2026) — Access mode: for authorization.SPbGUVM users.
2. Hsu, Walter H. Handbookof Veterinary Pharmacology / W. H. Hsu. - Ames : Wiley-Blackwell, 2008. - 550 p. - https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTg1MDgmcHM9NTY0 (date of access: 10/04/2026) — Access mode: for authorization.SPbGUVM users.

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
Basics of veterinary pharmacy	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
" BASICS OF VETERINARY PHARMACY "

Level of higher education
SPECIALIST COURSE

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

Education starts in 2026

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1. PASSPORT OF THE FUND OF ASSESMENT TOOLS

№	Acquired competence	Assessed modules of a discipline	Assesment tool
1.	***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-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.	Manufacturing technology of dosage forms	Seminar, Test, Report
2.		Analysis of inorganic, organic medicines and highly active BAS	Seminar, Test, Report

List of assessment tools

№	Name of the assessment tool	Brief description of the assesment tool	Presentation of the assessment tool in the fund
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
3.	Report	The abstract compares different points of view on a specific topic, including an overview of relevant literary and other sources of information.	An approximate list of topics

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	
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-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.	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-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

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 knowledge survey

Assessed modules of a discipline	Acquired competence (identification)	Questions on topics/modules of the discipline
Manufacturing technology of dosage forms	***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-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.	1. The history of pharmaceutical technology development. 2. Pharmacy and industrial production. 3. Pharmaceutical technology as a science and academic discipline. The tasks of pharmaceutical technology. 4. Laboratory equipment of the pharmacy. 5. Metrological characteristics of the scales. 6. The rules of dosing on the scales. 7. Dosing by volume and drops. 8. The technology of manufacturing simple powders 9. Technology of manufacturing complex powders 10. Manufacturing technology of powders with coloring substances 11. The technology of manufacturing powders with potent substances 12. Technology of preparation of triturations 13. Manufacturing technology of powders forming eutectic mixtures 14. Manufacturing and features of the collection technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS. 15. Manufacture and features of tablet technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS. 16. Manufacture and features of the dragee technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS. 17. Manufacture and features of pellet technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS. 18. Classification of dosage forms (by aggregate state, by type of dispersed system, by route of administration, by type of release). 19. Physical and chemical processes occurring during the storage of medicines. 20. Dependence of stability of medicines on receipt, storage and transportation 21. Shelf life of medicinal substances 22. The effect of the chemical composition of the packaging material on the stability of medicines

		23. Improving the stability of medicines
Analysis of inorganic, organic medicines and highly active BAS	***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-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.	1. The history of pharmaceutical chemistry. 2. Features of storage of medicinal substances. 3. Determination of the solubility of slowly soluble medicinal substances. 4. The influence of chemical structure on the pharmacological effect of drugs. 5. Viscosity of medicinal substances and methods of its investigation. 6. Pharmacopoeia analysis to determine the authenticity of sodium thiosulfate. 7. Pharmacopoeia analysis to determine the authenticity of hydrogen peroxide. 8. Pharmacopoeia analysis to determine the authenticity of iodine preparations. 9. Classification features of inorganic medicines. 10. Classification features of organic medicines. 11. Determination of turbidity and transparency of the liquid. 12. The main stages of drug development. 13. Features of the study of refractive indices of medicinal substances. 14. Features of the chemical method of analysis of inorganic medicinal substances. 15. Features of the chemical method of analysis of organic medicinal substances. 16. Density of medicinal substances and methods of its investigation. 17. The structure of the pharmacopoeia article. 18. Gravimetric method of drug analysis. 19. Titrimetric method of drug analysis. 20. Pharmaceutical analysis of halide preparations. 21. Pharmaceutical analysis of halogen preparations. 22. Physico-chemical methods of analysis of medicinal substances.

3.1.2 Test-questions

Tests to assess the competence of ***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:

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-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.

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

PC-5.1 To be able to use specialized information databases at a choice of animal treatment methods:

Task 1.

Read the text and choose the correct answer.

The Federal State Veterinary Information System VetIS collects, processes, analyzes, stores, searches and provides information to the user, including about medicines, pharmaceutical substances and feed additives. Which component of the VetIS special information systems is designed to monitor the safety of medicinal products for veterinary use, record side effects, serious adverse reactions, unforeseen adverse reactions when using medicinal products for veterinary use and provide information about this?

1. Galen;
2. Argus;
3. Cyrano.

Answer: 1

Read the text and choose the correct answer.

PC-5.6 Know the state register of medicines for veterinary use

Task 2.

The Federal State Veterinary Information System VetIS collects, processes, analyzes, stores, searches and provides information to the user, including about medicines, pharmaceutical substances and feed additives. Which component of VetIS forms the information register of medicines and feed additives?

1. Mercury;
2. Cerberus;
3. Irena;

4. Assol.
Answer: 3

Task 3.
Read the text and choose the correct answer.
Starting from March 1, 2025, according to the order of the Ministry of Agriculture of the Russian Federation, all veterinary specialists are required to prescribe antimicrobial drugs for veterinary use to animals. What order of the Ministry of Agriculture regulates the list of antimicrobial drugs?
Specify the mechanism of antibacterial action of sulfonamides:
1. Order of the Ministry of Agriculture of the Russian Federation No. 426 dated July 29, 2020;
2. Order of the Ministry of Agriculture of the Russian Federation No. 555 dated September 21, 2020;
3. Order of the Ministry of Agriculture of the Russian Federation No. 776 dated November 02, 2022.
Answer: 3

PC-5.2 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 4.
Read the text and choose the correct answer.
The breadth of the therapeutic effect of the drug is:
1. therapeutic dose of the medicine;
2. the ratio of the drug concentration in an organ or tissue to its concentration in blood plasma;
3. the range between the minimum therapeutic and minimum toxic
concentrations of the drug in plasma;
4. Percentage of non-protein-bound drugs;
5. The range between the minimum and maximum therapeutic concentrations of the drug.
Answer: 5

TASKS OF A COMBINED TYPE WITH THE CHOICE OF SEVERAL CORRECT ANSWERS FROM THE SUGGESTED OPTIONS

PC-5.7 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 5.
Read the text and choose the correct answers.
Incompatibility of medicinal substances can be
a) emotional
b) physiological
c) pharmacological
d) pharmaceutical
Answer: c, d

CLOSED-TYPE COMPLIANCE ASSIGNMENTS

PC-5.7 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 6.
Read the text and make a match.
Disinfectants and antiseptics are used to destroy pathogens in the external environment of rooms and on surfaces, in body cavities. The mechanism of action of disinfectants and antiseptics is diverse. Establish a correspondence between the group of disinfectants and antiseptics and the mechanism of action: for each position of the first column, select the corresponding position from the second column.

A group of disinfectants and antiseptics		**Механизм действия**	
А	Aldehydes	1	When interacting with tissues, atomic oxygen is released.
Б	Phenol and its derivatives	2	disruption of absorption and excretion processes in microbial cells, blocking of enzymes, disruption of protein synthesis in microbial cells and parasites
В	Oxidizing agents	3	they change the pH of the medium, dehydration of bacterial cells, protein denaturation
Г	Silks and acids	4	oxygen depletion from protein compounds, protein denaturation, and destruction of individual systems in mitochondria

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

А	Б	В	Г

Answer:А4Б2В1Г3.

Task 7.
Read the text and make a match.
Medicinal products are classified according to their chemical structure, pharmacological action, and therapeutic use. Establish the correspondence between which drugs belong to which pharmacological groups: for each position in the first column, select the corresponding position from the second column.

Pharmacological group		**Лекарственное средство**	
А	Antibiotics	1	Sodium hydroxide
Б	Anesthetics	2	Nilverm
В	Antiseptics and disinfectants	3	Sulfadiazine-trimethoprim
Г	Sulfonamide products	4	Oxytetracycline hydrochloride
Д	Antiparasitic agents	5	Lidocaine

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

А	Б	В	Г	Д	Е

Answer: А4Б5В1Г3Д2.

PC-5.3 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 8.

Read the text and make a match.

Solutions, both simple and complex, are prepared by volume, weight, and bulk methods, in some cases pre-calculated using the formula. Establish a correspondence between the term and the phrase that accurately expresses the method of manufacturing solutions.

The method of manufacturing solutions		**Definition**	
A	The volumetric method	1	To the weighted mass of the medicinal substance poured into a measuring vessel, add 1/2 - 1/3 of the calculated volume of the solvent measured with measuring utensils. After dissolving the medicinal substance (by shaking, stirring with a glass wand or using a magnetic stirrer), the solution is brought to the required volume
Б	Weight method	2	The soluble medicinal substance and solvent are taken by weight
В	Weight-volume method	3	The production of less concentrated solutions from concentrated solutions is calculated using the formula: the required concentration is multiplied by the required volume, divided by the initial concentration, and the initial volume is obtained, which is adjusted with a solvent to the required volume

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

А	Б	В

Answer: А3Б2В1.

PC-5.7 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 9.

Read the text and make a match.

Among chemotherapeutic agents, antibiotics have no equal in terms of breadth and global application in many infectious and invasive diseases. As a rule, antibiotics are classified according to their chemical structure, origin, direction of action and mechanism of action. Establish the compliance of antibiotics by chemical structure:

Establish a correspondence between the competencies and their characteristics:

	The antibiotic		**Химическая структура**
А	Penicillin	1	Aromatic series of the structure
Б	Tetracycline	2	Of an alicyclic structure
В	Chloramfinecol	3	β-lactam or heterocyclic

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

А	Б	В

Answer: А3Б2В3.

PC-5.7 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 10.

Read the text and make a match.

Among chemotherapeutic agents, antibiotics have no equal in terms of breadth and global application in many infectious and invasive diseases. As a rule, antibiotics are classified according to their chemical structure, origin, direction of action and mechanism of action. Establish the correspondence of antibiotics according to the mechanism of action:

Establish a correspondence between the competencies and their characteristics:

	The antibiotic		**Chemical structure**
А	Penicillin	1	Suppresses DNA synthesis
Б	Tetracycline	2	Inhibits the synthesis of microbial protein
В	Rubomycin	3	Inhibits the cell wall of the microorganism

Write down the selected numbers under the corresponding letters:

А	Б	В

Answer: А3Б2В3.

CLOSED-TYPE TASKS FOR ESTABLISHING THE SEQUENCE

PC-5.7 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.

In the production of tablets, the technological process includes several stages. Arrange the stages of tablet production in chronological order, in the correct sequence.

1. Preparation stage
2. Tableting stage
3. Granulation stage
4. Marking stage
5. Packing stage

Answer:13254

Task 12.

Read the text and set the sequence.

The State Pharmacopoeia is a collection of regulatory documents (pharmacopoeia articles) regulating the quality requirements of medicines. Pharmacopoeia articles are divided into general and particular. General pharmacopoeia articles contain descriptions of methods of drug analysis, data on the reagents and indicators used in this process. Private pharmacopoeia articles are standards of medicines, they contain lists of indicators and methods of quality control of medicines and descriptions of medicines, as well as auxiliary substances and raw materials for their production. Place the most pharmacopoeias sequentially to increase in which century the most pharmacopoeias were revised and published.

1. The XVIII century
2. The 19th century
3. The XX century
4. The 21st century

Answer: 1243

Task 13.
Read the text and set the sequence.
There are types of intra-pharmacy control in the manufacture of medicines in a pharmacy, in what order is the control carried out?
1. Organoleptic control
2. Written control
3. Vacation control
Answer: 213

Task 14.
Read the text and set the sequence.
Potassium permanganate is a strong oxidizing agent. In aqueous solutions, when combined with organic substances, it decomposes with the release of oxygen, which acts antimicrobially and deodorizes, and manganese salts exhibit astringent or irritating effects (depending on the concentration). In fish farming, it is used in the treatment of fish from ectoparasites (crustaceans) and bacterial infections of the gills and skin. It is used in the form of baths, the exposure depends on the dose. Set the exposure sequence based on the calculation if 1000 mg/L, 100 mg/L and 10 mg/L are used.:
1. 30-60 minutes;
2. 5-10 minutes;
3. 10-40 seconds.
Answer: 321

PC-5.7 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 15.
Read the text and set the sequence.
The bacteriostatic effect of sulfonamide drugs is associated with their competitive antagonism with paraaminobenzoic acid, thus disrupting the chain of transformations for the synthesis of purine and pyrimidine bases of the microbial cell. Establish the sequence of synthesis of nucleic acids of a microbial cell:
1. Synthesis of tetrahydrofolic acid
2. Synthesis of dihydropteroate synthetase
3. Synthesis of dihydrofolic acid
4. Synthesis of purine and pyrimidine bases
Answer: 2314

AN OPEN TYPE TASK

PC-5.5 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 16.
Read the text and give a detailed, reasoned answer.
Increasing the therapeutic effectiveness of antibiotics, reducing their side effects on the body and reducing the development of resistance to them in pathogenic microorganisms is achieved through

tactical (immediate) and strategic (for the future) measures. What tactical measures are aimed at improving the effectiveness of antibiotics?
Answer: 1) it is necessary to determine the sensitivity of microorganisms; 2) start treatment as early as possible; 3) use sufficient therapeutic doses; 4) follow the course of drug use (at least 4-5 days); 5) use combinations of synergistic drugs; 6) choose rational ways of administering antibiotics; 7) know the timing of drug circulation in the body; 8) consider side effects.

Task 17.
Read the text and give a detailed, reasoned answer.
Increasing the therapeutic effectiveness of antibiotics, reducing their side effects on the body and reducing the development of resistance to them in pathogenic microorganisms is achieved through tactical (immediate) and strategic (for the future) measures. What strategic measures are aimed at improving the effectiveness of antibiotics?
Answer: Strategic measures are aimed at preserving the therapeutic value of antibiotics for a longer period of time, which can be achieved through the use of everyday and reserve antibiotics.

PC-5.7 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 18.
Read the text and give a detailed, reasoned answer.
Antimicrobial agents have the ability to have a detrimental effect on cells. What is the distinctive feature of the effect on cells of drugs of the antiseptic and disinfectant group in comparison with antibiotics?
Answer: Antiseptics and disinfectants do not selectively act on cells, unlike antibiotics, which selectively act on Gram-positive or Gram-negative microorganisms.

Task 19.
Read the text and give a detailed, reasoned answer.
Antibiotics began to be used as growth-stimulating (ergotropic) drugs almost immediately after their appearance in the medical arena, namely in the early 50s of our century. At the same time, most antibiotics were initially used as growth-stimulating agents, and only later (in the early 60s) preference was given to tetracycline drugs as the most effective. At the same time, the further use of these antibiotics as growth-stimulating agents began to be restrained, as they are still used for medicinal purposes.
Feed antibiotics are subject to requirements that ensure, on the one hand, the activation of growth, on the other hand, do not prevent a decrease in the therapeutic value of antibiotics used to combat infectious diseases. Feed antibiotics should not only have a positive effect on growth and development, but also have certain characteristics. Specify what features should feed antibiotics have?
Answer: Feed antibiotics should have the following features: they should not be absorbed into the gastrointestinal tract and should not contaminate animal products; they should not be used in medical practice; they should not have the ability to form multiple resistance in microorganisms.

Task 20.
Read the text and write down a detailed, reasoned answer.
With prolonged use of antibiotics, sulfonamide preparations, and other drugs, it is possible for microorganisms to develop resistance to a certain group of antibacterial agents. But since each group has a fairly extensive arsenal of medicines, is it possible to use antibacterial drugs of a certain group, for example, sulfonamide drugs, if microorganisms have developed resistance to at least one drug from the sulfonamide group?

Answer: With prolonged use of sulfonamides, the resistance of microorganisms to them gradually develops and cross-resistance to all sulfonamide preparations occurs. In case of cross-resistance, all drugs included in the group of sulfonamide agents are excluded from therapy.

3.1.3 Topics for preparation of reports

Topics of abstracts for the assessment of competencies:
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-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.

1. Principles of dosage of medicines.
2. Pharmaceutical incompatibility.
3. The technology of manufacturing simple powders.
4. The technology of manufacturing complex powders.
5. The technology of manufacturing powders with coloring substances.
6. The technology of manufacturing powders with potent substances.
7. Technology of preparation of triturations.
8. Manufacturing technology of powders forming eutectic mixtures
9. Features of the collection technology.
10. Features of tablet technology.
11. The technology of manufacturing long-acting tablets.
12. Features of the dragee technology.
13. Features of pellet technology.
14. Features of the technology of ointments and pastes.
15. Features of liniment technology.
16. Features of suppository technology.
17. Features of the technology of solutions.
18. Features of emulsion technology.
19. Features of suspension technology.
20. Features of the technology of infusions and decoctions.
21. The importance of the state pharmacopoeia.
22. The history of pharmaceutical chemistry.
23. Features of storage of medicinal substances.
24. Determination of the solubility of slowly soluble medicinal substances.
25. The influence of chemical structure on the pharmacological effect of drugs.
26. Viscosity of medicinal substances and methods of its investigation.

27. Pharmacopoeia analysis of the authenticity of sodium thiosulfate.
28. Pharmacopoeia analysis to determine the authenticity of hydrogen peroxide.
29. Pharmacopoeia analysis of determining the authenticity of iodine preparations.
30. Classification features of inorganic medicines.
31. Classification features of organic medicines.
32. Determination of turbidity and transparency of the liquid.
33. The main stages of drug development.
34. Features of the study of refractive indices of medicinal substances.
35. Features of the chemical method of analysis of inorganic medicinal substances.
36. Features of the chemical method of analysis of organic medicinal substances.
37. Density of medicinal substances and methods of its investigation.
38. The structure of the pharmacopoeia article.
39. Gravimetric method of drug analysis.
40. Titrimetric method of drug analysis.
41. Pharmaceutical analysis of halide preparations.
42. Pharmaceutical analysis of halogen preparations.
43. Physico-chemical methods of analysis of medicinal substances.

3.1.4. Questions for the credit

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. The concept of pharmaceutical incompatibilities.
2. General characteristics of s-element medicines.
3. General characteristics of p-element medicines.
4. Medicines of the p-elements of group VII.
5. Medicines of the p-elements of group VI.
6. The causes of pharmaceutical incompatibilities in the extemporal dosage forms of pharmacies.
7. Classification of incompatibilities in dosage forms.

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.

8. The concept of dosing.
9. Types of dosing.

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.

10. Comparative characteristics of dosing by weight and volume.

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.

11. Rules for the preparation of homogeneous and heterogeneous liniments (balsamic (according to Vishnevsky), ammonia, iodine-paraffin)
12. Evaluation of the quality of medicines.
13. Establishing the authenticity of medicines.
14. Stability and shelf life of medicines.
15. General methods for investigating the purity of medicinal substances.
16. Methods for establishing the physical and chemical properties of medicinal substances.

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

17. Pharmaceutical analysis of alcohols.
18. Pharmaceutical analysis of aldehydes.
19. Pharmaceutical analysis of carbohydrates.
20. Pharmaceutical analysis of esters.

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.

21. Determination of powders as a dosage form and a dispersed system. Characteristics of powders.
22. Classification of powders by composition, method of application, dosage, method of prescribing, etc.
23. Characteristics of ointments as a dosage form and a dispersed system. Classification.
24. Ointment bases. Classification and characteristics of the basics, representatives.
25. Hydrophobic, hydrophilic, lipophilic-hydrophilic ointment bases.
26. Liniments. Characteristics, classification.
27. The main indicators of the quality of ointments and liniments. Registration for vacation
28. Characteristics and classification of tablets as a dosage form.
29. Auxiliary substances in the production of tablets, their classification, purpose, nomenclature, diluents, binders, loosening, sliding and lubricating, dyes, prolongators.
30. The main types of chemical incompatibilities that are detected by external signs. (precipitation formation; release of gases; discoloration.)
31. Determination of powders as a dosage form and a dispersed system. Characteristics of powders.
32. Classification of inorganic substances.
33. Chemistry of magnesium medicines.
34. Chemistry of calcium medicines.
35. Chemistry of barium medicines.
36. Medicinal products of organic nature and features of their analysis.

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 for evaluating students' knowledge in the preparation of reports

The mark "**excellent**" - the problem is identified and its relevance is justified; an analysis of various points of view on the problem under consideration is made and one's own position is logically stated; conclusions are formulated, the topic is fully disclosed, the volume is maintained; the requirements for external design are met, the basic requirements for the report are fulfilled.

The mark "**good**" - mistakes have been made. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the report is not maintained; there are omissions in the design, there are significant deviations from the requirements for the presentation of materials.

The mark "**satisfactory**" - the topic is only partially covered; factual errors were made in the content of the report; there are no conclusions, the topic of the report is not disclosed.

The mark "**unsatisfactory**" - there is a significant misunderstanding of the problem or the report is not submitted.

4.5. 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

4.6. 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.V.20 "Basics of veterinary pharmacy"
specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»

The purpose of mastering the discipline: to study the theoretical foundations of technological processes for the production and processing of medicinal substances into therapeutic, preventive, rehabilitative diagnostic drugs in the form of various dosage forms, as well as to develop practical skills for conducting pharmaceutical quality control of medicines and finished dosage forms manufactured in a pharmacy.

The place of discipline in the curriculum: B1.V.20 is a mandatory part, the discipline is mastered by students in the 5th semester (full-time study).

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

PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual characteristics, 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-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.

Summary of the discipline: To achieve this goal, it is necessary to solve the following tasks: to study the methods of obtaining medicinal substances; to study the technological process of manufacturing various dosage forms in pharmacy and industrial production; to study the main stages and features of pharmaceutical analysis of medicinal substances; to study the regulatory requirements for the quality of dosage forms; to study methods of quality control of dosage forms and conditions their storage.

As a result of mastering the discipline, the student must: Know: 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 state register of medicines for veterinary use; 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

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.

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

Final control of the discipline: test