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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.  
May 6, 2024

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**  
**Full-time education**  
Education starts in 2024

Reviewed and adopted  
at the meeting of the department  
on May 2, 2024.  
Protocol No. 12

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

Saint Petersburg  
2024

## 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 05.36.01 "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 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.

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

Discipline B1.V.21 "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
<b>Classroom classes (total)</b>	<b>32</b>	<b>32</b>
<b>Including:</b>	-	-
<b>Lectures, including interactive forms</b>	16	16
Practical (PP), including interactive forms, among which are:	16	16
practical training (PT)	4	4
<b>Self-study</b>	<b>40</b>	<b>40</b>
Report	+	+
Type of intermediate and final certification (credit, exam)	Credit	Credit
Total labor intensity hours/credits	<b>72/2</b>	<b>72/2</b>

## 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.	<p><b>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 in the animal body.</b></p> <p>PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>PC-5 ID-6 - To know the state register of medicines for veterinary use.</p> <p>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.</p>	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 methodological guide to practical classes in pharmaceutical chemistry for students of the veterinary faculty of full-time and part-time education / author-comp.: N. L. Andreeva [et al.]; SPbSAVM. - St. Petersburg : SPbSAVM, 2017. - 65 p. - Text : electronic. — URL: UMP in pharmaceutical chemistry. (accessed 04/27/2024) . — Access mode: for authorization.SPbSUVVM users.
2. Educational and methodological guide to practical classes in pharmaceutical technology for students of the veterinary Faculty of full-time and part-time education / Andreeva Nadezhda Lukoyanovna, Sokolov Vladimir Dmitrievich, Lunegov Alexander Mikhailovich [et al.] ; Ministry of Agriculture of the Russian Federation, SPbSAVM. — St. Petersburg : SPbSAVM, 2016. 123 p. — Text : electronic. — URL: : UMP on pharmaceutical technology (accessed 04/27/2024). — Access mode: for authorization.users of the SPbSUVVM EB.
3. 3. Textbook on general and medical prescription / comp. N. L. Andreeva [et al.]; SPbSAVM. — St. Petersburg : SPbSAVM, 2014. — 79 p. — Text : electronic. — URL: Textbook on general and medical prescription. Andreeva N.L. I. (accessed 04/27/2024). — Access mode: for authorization.users of the SPbSUVVM EB.
4. Methodological recommendations for writing an abstract at the Department of Pharmacology and Toxicology for 5th year students of the Faculty of Veterinary Medicine / author-comp.: A.M. Lunegov, O. S. Popova, V. A. Baryshev; SPbSAVM. — St. Petersburg : SPbSAVM, 2017. — 23 p. — Text : electronic. — URL: : Method. recommendations for writing an abstract at the Department of Pharmacology (accessed 04/27/2024). — Access mode: for authorization.users of the SPbSUVVM EB

### **6.2. Literature for self-work**

1. Chemical technology of medicinal substances. The main processes of chemical synthesis of biologically active substances : a textbook / Jozep Anatoly Albertovich [et al.]. — Ed. 2nd, ster. — St. Petersburg : Lan, 2017. — 356 p. — (Textbooks for universities. Special literature). — Text (visual) : direct. — ISBN 978-5-8114-2037-7 : [https://e.lanbook.com/book/91905#book\\_name](https://e.lanbook.com/book/91905#book_name) (accessed 04/27/2024).
2. Chemical technology of pharmaceutical substances : textbook. the manual / Jozep Anatoly Albertovich [et al.]. — St. Petersburg : Lan, 2016. — 384 p. — Text : electronic. — ISBN 978-5-8114-2164-0. URL: [http://e.lanbook.com/books/element.php?pl1\\_id=87576](http://e.lanbook.com/books/element.php?pl1_id=87576) (accessed 04/27/2024).

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

### **8.**

#### **7.1. Basic literature**

1. Pharmaceutical technology : textbook for universities / A.M. Lunegov, A. A. Deltsov, V. A. Baryshev [et al.]. — St. Petersburg : Lan, 2024. — 288 p. — ISBN 978-5-507-49126-1. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/405449> (accessed 04/27/2024). — Access mode: for authorization. users.
2. Fundamentals of veterinary pharmacy / A.M. Lunegov, N. L. Andreeva, V. A. Baryshev, O. S. Popova. — 2nd ed., erased. — St. Petersburg : Lan, 2022. — 180 p. — ISBN 978-5-507-44825-8. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/245588> (accessed 04/27/2024). — Access mode: for authorization. users.

3. Veterinary pharmacy : textbook / N. L. Andreeva, G. A. Nozdrin, A.M. Lunegov [et al.]. — St. Petersburg : Lan, 2020. — 452 p. — ISBN 978-5-8114-4573-8. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/126918> (accessed 04/27/2024). — Access mode: for authorization. users.

## **7.2. Additional literature**

1. Pharmacognosy and veterinary phytotherapy : textbook for universities / A. A. Deltsov, A.M. Lunegov, R. F. Ivannikova, V. A. Baryshev. — St. Petersburg : Lan, 2023. — 676 p. — ISBN 978-5-507-48374-7. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/380606> (accessed 04/27/2024). — Access mode: for authorization. users.
2. Lunegov, A.M. Pharmacognosy : a textbook for universities / A.M. Lunegov, V. A. Baryshev. — St. Petersburg : Lan, 2022. — 148 p. — ISBN 978-5-8114-9109-4. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/221183> (accessed 04/27/2024). — Access mode: for authorization. users.
3. Vashchekin, E.P. Veterinary formulation [Electronic resource] : textbook / E.P. Vashchekin, K.S. Malovastyj. — Electron. dan. — St. Petersburg : Lan, 2017. — 240 p. — Access mode: <https://e.lanbook.com/book/91907>. — Title from the screen (accessed 04/27/2024.)
4. Manufacturing technology of dosage forms : 2019-08-14 / F. A. Medetkhanov, A. P. Ovsyannikov, D. D. Khairullin, L. A. Mullakaeva. — Kazan : KGAVM named after Bauman, 2016. 123 p. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/122954> (accessed 04/27/2024). — Access mode: for authorization. users.
5. Molyanova, G. V. Fundamentals of pharmacy : methodological guidelines / G. V. Molyanova. — Samara : SamGAU, 2019. — 22 p. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/123560> (accessed 04/27/2024). — Access mode: for authorization. users.
6. Saushkina, A. S. Calculation methods in pharmaceutical analysis : a textbook for universities / A. S. Savushkina. — 3rd ed., erased. — St. Petersburg : Lan, 2021. — 428 p. — ISBN 978-5-8114-8004-3. — Text : electronic // Lan : electronic library system. — URL: <https://e.lanbook.com/book/171890> (accessed 04/27/2024). — Access mode: for authorization. users.

## **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](http://rlsnet.ru) Encyclopedia of medicines and pharmacy products
2. [Vidal.ru](http://Vidal.ru) The Vidal Veterinarian Handbook
3. [www.vetlek.ru](http://www.vetlek.ru)
4. [fsvps.gov.ru](http://fsvps.gov.ru) Rosselkhoz nadzor
5. [meduniver.com](http://meduniver.com) Medical Information Site

### **Electronic library systems**

1. ELS "SPBGUVM"
2. ELS "Lan Publishing House"
3. Legal reference system "ConsultantPlus"
4. University information system "RUSSIA"
5. Full-text database POLPRED.COM

6. Scientific electronic Library ELIBRARY.RU
7. Russian Scientific Network
8. Database of international scientific citation indexes Web of Science
9. Scopus database of International Science Citation Indexes
10. Full-text interdisciplinary database on agricultural and environmental sciences  
ProQuest AGRICULTURAL AND ENVIRONMENTAL SCIENCE DATABASE
11. Electronic books of the publishing house "Prospekt Nauki"  
<http://prospektnauki.ru/ebooks/>
12. 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 to 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 mastery 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 transcend 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 taking 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 code, 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 activity are 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 SOCIAL 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://spbguv.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	The title of special rooms and rooms for self-work	Equipment of special rooms and rooms for self-work
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accordance with the curriculum		
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
	114 (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	Specialized furniture: tables, chairs, special equipment, materials and spare parts for preventive maintenance of technical training facilities

	maintenance of educational equipment	
	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.

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  
Full-time education.

Education starts in 2024

Saint Petersburg  
2024

## 1. PASSPORT OF THE FUND OF ASSESMENT TOOLS

№	Acquired competence	Assessed modules of a discipline	Assesment tool
1.	<p><i>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.</i></p> <p>PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.</p> <p>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.</p> <p>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.</p>	Manufacturing technology of dosage forms	Seminar, Test, Report
2.	<p>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.</p> <p>PC-5 ID-6 - To know the state register of medicines for veterinary use.</p> <p>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.</p>	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 acquired	The level of development			Assessment tool
	Unsatisfactory	Satisfactory	Good	
PC-5. To carry out plan of animal treatment, based on the stated diagnosis and animals individual character istics, 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
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
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
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	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, 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, 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	<p><b>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.</b></p> <p>PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>PC-5 ID-6 - To know the state register of medicines for veterinary use.</p> <p>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.</p>	<ol style="list-style-type: none"> <li>1. The history of pharmaceutical technology development.</li> <li>2. Pharmacy and industrial production.</li> <li>3. Pharmaceutical technology as a science and academic discipline. The tasks of pharmaceutical technology.</li> <li>4. Laboratory equipment of the pharmacy.</li> <li>5. Metrological characteristics of the scales.</li> <li>6. The rules of dosing on the scales.</li> <li>7. Dosing by volume and drops.</li> <li>8. The technology of manufacturing simple powders</li> <li>9. Technology of manufacturing complex powders</li> <li>10. Manufacturing technology of powders with coloring substances</li> <li>11. The technology of manufacturing powders with potent substances</li> <li>12. Technology of preparation of triturations</li> <li>13. Manufacturing technology of powders forming eutectic mixtures</li> <li>14. Manufacturing and features of the collection technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS.</li> <li>15. Manufacture and features of tablet technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS.</li> <li>16. Manufacture and features of the dragee technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS.</li> <li>17. Manufacture and features of pellet technology. Tests, quantitative and qualitative determination of the dosage form, according to the OFS.</li> <li>18. Classification of dosage forms (by aggregate state, by type of dispersed system, by route of administration, by type of release).</li> <li>19. Physical and chemical processes occurring during the storage of medicines.</li> <li>20. Dependence of stability of medicines on receipt, storage and transportation</li> <li>21. Shelf life of medicinal substances</li> <li>22. The effect of the chemical composition of the packaging material on the stability of medicines</li> </ol>

Analysis of inorganic, organic medicines and highly active BAS	<p><b>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.</b></p> <p>PC-5 ID-1 - To be able to use specialized information databases at a choice of animal treatment methods.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>PC-5 ID-6 - To know the state register of medicines for veterinary use.</p> <p>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.</p>	<p>23. Improving the stability of medicines</p> <ol style="list-style-type: none"> <li>1. The history of pharmaceutical chemistry.</li> <li>2. Features of storage of medicinal substances.</li> <li>3. Determination of the solubility of slowly soluble medicinal substances.</li> <li>4. The influence of chemical structure on the pharmacological effect of drugs.</li> <li>5. Viscosity of medicinal substances and methods of its investigation.</li> <li>6. Pharmacopoeia analysis to determine the authenticity of sodium thiosulfate.</li> <li>7. Pharmacopoeia analysis to determine the authenticity of hydrogen peroxide.</li> <li>8. Pharmacopoeia analysis to determine the authenticity of iodine preparations.</li> <li>9. Classification features of inorganic medicines.</li> <li>10. Classification features of organic medicines.</li> <li>11. Determination of turbidity and transparency of the liquid.</li> <li>12. The main stages of drug development.</li> <li>13. Features of the study of refractive indices of medicinal substances.</li> <li>14. Features of the chemical method of analysis of inorganic medicinal substances.</li> <li>15. Features of the chemical method of analysis of organic medicinal substances.</li> <li>16. Density of medicinal substances and methods of its investigation.</li> <li>17. The structure of the pharmacopoeia article.</li> <li>18. Gravimetric method of drug analysis.</li> <li>19. Titrimetric method of drug analysis.</li> <li>20. Pharmaceutical analysis of halide preparations.</li> <li>21. Pharmaceutical analysis of halogen preparations.</li> <li>22. Physico-chemical methods of analysis of medicinal substances.</li> </ol>
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### 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 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:

**1. Dosage forms are not classified:**

- a) by the aggregate state
- b) by the number of technological operations
- c) by the nature of the dispersed system
- d) by dosage
- e) on the way of introduction

**2. Dosage forms are classified:**

- a) by the nature of the dispersed system
- b) according to the complexity of the composition
- c) according to the list "A" or "B"
- d) according to the stages of preparation
- e) type of packaging

**3. Only enterally administered dosage forms include:**

- a) suspensions
- b) emulsions
- c) pills
- d) eye drops

**4. Enterally administered dosage forms do not include:**

- a) powders
- b) solutions
- c) lotions
- d) suppositories
- e) infusions and decoctions

**5. Parenterally administered dosage forms do not include:**

- a) medicines
- b) injection solutions

**6. Parenterally administered dosage forms only include:**

- a) solutions for injection
- b) solutions
- c) powders
- d) pills

**7. Establish compliance with the term auxiliary substance:**

- a) nicotinic acid
- b) streptocide ointment
- c) foxglove leaves
- d) eye drops

e) oxyl

**8. Establish compliance with the term medicinal product:**

- a) pilocarpine hydrochloride
- b) suspension
- c) euphyllin suppositories
- d) polyvinyl alcohol
- e) motherwort herb

**9. Establish compliance with the term medicinal product:**

- a) powders
- b) belladonna extract
- c) glucose solution for injection
- d) vaseline
- e) twin-80

**10. Establish compliance with the term medicinal product:**

- a) infusion
- b) powders with dibazole
- c) sodium methobisulfite
- d) mint leaves
- e) mercury oxide eye ointment

PC-5 ID-2 - To be able to calculate the amount of remedies for the treatment of animals and the prevention:

**11. Pre-grinding accelerates the dissolution process of:**

- a) gelatin
- b) potassium permanganate
- c) collargol
- d) dibazole
- e) sodium bromide

**12. Single and daily doses in solutions for internal use are checked:**

- a) magnesium sulfate
- b) nicotinic acid
- c) sodium benzoate
- d) pepsin

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.

**13. Add: "Slowly soluble substances are substances that require more than to dissolve... minutes".**

- a) 1 min
- b) 3 min
- c) 5 min
- d) 10 min
- e) 30 min

**14. One of the requirements for the bases for ointments is:**

- a) biological harmlessness
- c) microbial contamination

- d) pH value > 7.0
- e) soft consistency and pH value > 7.0

**15. One of the requirements for the bases for ointments is:**

- a) microbial contamination
- b) chemical indifference
- c) melting point no more than 36.6 ° C
- d) PH value > 7.0

**16. One of the requirements for the bases for ointments is:**

- a) a soft consistency
- b) a certain color
- c) density not more than 1.0
- g) PH value > 7.0

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.

**17. According to the nature of the effect on the body, ointments are distinguished:**

- a) reflex action
- b) for proctology
- c) vaginal
- d) creams

**18. According to the nature of the effect on the body, ointments are distinguished:**

- a) dermatological
- b) for surgery
- c) liniments
- d) general action

**19. Depending on the field of application, ointments are distinguished:**

- a) vaginal
- b) liniments
- c) creams
- d) pastes
- e) extraction

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

**20. Definition: "Ointments are a mild dosage form intended for application to wounds, skin or mucous membranes":**

- a) corresponds to GF XIV
- b) partially corresponds to GF XIV
- c) does not correspond to GF XIV

**21. An indicator of the quality of suppositories in accordance with GF XIV edition is:**

- a) viscosity
- b) dissolution time and uniformity
- c) time of complete deformation or dissolution time
- d) plasticity

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.

**22. One of the requirements for liquid dispersion media is:**

- a) high solvent capacity
- b) desorption ability
- c) ability to microbial contamination

**23. One of the requirements for liquid dispersion media is:**

- a) the ability to desorption
- b) chemical and pharmacological indifference
- c) the ability to microbial contamination

**24. One of the requirements for liquid dispersion media is:**

- a) the ability to desorption
- b) the ability to microbial contamination
- c) satisfactory organoleptic properties

**25. Features of the manufacture of concentrated solutions for the manufacture of medicines:**

- a) aseptic manufacturing conditions
- b) straining through sterile cotton wool
- c) sterilization of the solution after manufacture

**26. Single and daily doses in solutions for internal use are checked:**

- a) hydrochloric acid
- b) potassium permanganate
- c) ascorbic acid
- d) benzoic acid

**27. Add: "Solutions of oxidizing agents, substances capable of sorption and coagulation on paper filters are filtered through ..."**

- a) glass filters
- b) cotton gauze
- c) membrane
- d) made of belting, silk and other fabrics

**28. Solutions containing ethanol are added to complex medicines in the order of:**

- a) reducing the concentration of ethanol
- b) increasing the concentration of ethanol

**29. Quality control of ointments in pharmacies necessarily includes:**

- a) quantification
- b) complete chemical control
- c) determination of bioavailability
- d) determination of uniformity

**30. As a solvent or co-solvent for the manufacture of injection solutions, do not use:**

- a) pyrogenic water
- b) ethyl oleate
- c) fatty oils
- d) benzyl alcohol
- e) mineral oils

**31. The addition of preservatives is allowed in injectable dosage forms for:**

- a) intracardiac administration
- b) intraocular administration
- c) intramuscular administration
- d) with a single dose of more than 15 ml
- e) infusion

**32. If the eye drops are not isotonic to the lacrimal fluid, then they:**

- a) do not have a pharmacological effect
- b) the medicinal substance is oxidized faster
- c) cause discomfort
- d) are subjected to microbial contamination

**33. Excipients: benzalkonium chloride, benzyl alcohol, used in the manufacture of eye drops, belong to the group:**

- a) viscosity regulators
- b) preventing hydrolysis processes
- c) preservatives
- d) antioxidants

**34. Salts of weak bases and strong acids in mixtures are incompatible with substances of the nature:**

- a) acidic
- b) alkaline

**35. Salts of strong bases and weak acids are incompatible in an aqueous dispersion medium with substances of the following nature:**

- a) acidic
- b) alkaline

**36. Add: "Hydrophobic liquids do not mix with liquids..."**

- a) hydrophilic
- b) diphilic
- c) surfactantly active
- d) nonpolar

**37. Sorbents are:**

- a) cocoa butter
- b) activated carbon
- c) potassium iodide

**38. The type of dosage form does not affect the processes of interaction of ingredients:**

- a) does not affect
- b) affects

**39. Sorbents are:**

- a) plant powders
- b) milk sugar
- c) petroleum jelly

**40. One of the features of the rectal route of administration is:**

- a) only local action in the pelvic

region

- b) the entry of substances into the systemic bloodstream, bypassing the liver
- c) the absence of drug metabolism

### 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 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.

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 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.

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:

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