

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY NATIONAL AGRARIAN UNIVERSITY

Faculty of VETERINARY MEDICINE

Therapy, Pharmacology Clinical Diagnosis and Chemistry Department

MODULE SYLLABUS
CLINICAL PHARMACOLOGY

(optional)

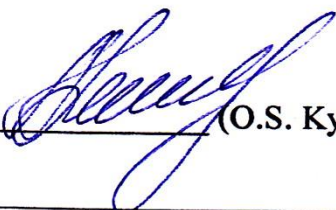
Implemented in the “211 "Veterinary medicine"” Academic Program

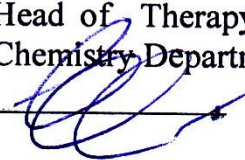
Area of specialization “Veterinary medicine”

at the first (master) level of higher education




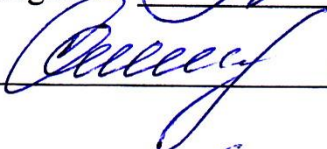
Sumy –2021

Author:  (O.S. Kysterna, Phd of Veterinary Science, Associate Professor)

Module syllabus agreed at the Therapy, Pharmacology Clinical Diagnosis and Chemistry Department meeting	Minutes No <u>15</u> dated of June <u>08</u> 2021
	Head of Therapy, Pharmacology Clinical Diagnosis and Chemistry Department <u></u> (Professor L.G. Ulko)


Approved by:


Guarantor of the Academic program  (L.G. Ulko)

Dean of the Faculty  (O.L. Nechiporenko)

Syllabus review (attached) is provided by : _

Member of the project team::  R.V. Dolbanosova

Teacher of the department:  O.I. Sklyar

Representative of the Department of Education Quality assurance licensing and accreditation  (Petroshyna H.O.)

Registered in electronic data base 1607 2021

Syllabus review data:

The academic year in which changes are made	The Academic program attachment number with changes description	Changes revised and approved		
		Minutes No and date of the department meeting	Head of Department	Guarantor of the Academic program

1. MODULE OVERVIEW

2. CORRELATION BETWEEN MODULE LEARNING OUTCOMES (MLOs) AND PROGRAM

1.	Title	VETERINARY PHARMACOLOGY		
2.	Faculty/Department	Faculty of VETERINARY MEDICINE Department of Therapy, Pharmacology Clinical Diagnosis and Chemistry		
3.	Type (compulsory or optional)	compulsory		
4.	Program(s) to which module is attached (to be filled in for compulsory types)	Implemented in the “211 "Veterinary medicine"” Academic Program Area of specialization “Veterinary medicine” at the first (bachelor's) level of higher education		
5.	Module can be suggested for (to be filled in for optional types)			
6.	Level of the National Qualifications Framework	7		
7.	Semester and duration of module	1		
8.	ECTS credits number	5		
9.	Total workload and time allotment	Directed study		Self-directed study
		Lectures	Practicals	
		8		22
10.	Language of instruction	English		
11.	Module leader	O.S. Kysterna		
12.	Module leader contact information	0506077825 Lesya_sumy2008@ukr.net		
13.	Module description	"Clinical pharmacology" is a basic subject for the training of veterinarians. Assimilation of which gives the opportunity to master the knowledge about veterinary drugs, their effects on the animal, the principles of their dosage and use in veterinary medicine and		

		(or) their implementation and storage
14	Module aim	Study of terms, concepts vet. pharmacology, basics of formulation, dosage, the concepts of "dose" and the principles of their calculation for different species of animals; farm, group vet. drugs, conditions of their storage and use; varieties of dosage forms and the basics of their manufacture and use. Study of general principles of action of drugs on the body, their pharmacodynamics, pharmacokinetics, biotransformation, direct and indirect effects of drugs, side effects, study and mastering the principles of distribution of drugs into major pharmacological groups, their features and pharmacological effects. Compliance with the safety of drugs for animals and humans, the mechanism of their excretion (correction), control of antimicrobial resistance
15	Module Dependencies (prerequisites, co-requisites, incompatible modules)	MS is based on OPP (educational and professional program for the specialty 211 "Veterinary Medicine" of the second master's level and is based on the results of training with OK: chemistry - types of solutions (colloidal, crystalloid, hypo-, iso-, hypertonic; concepts of alkalis, acids), Latin - Latin names, prescription terms, physiology, US physiology - the concepts of endogenous and exogenous factors, inflammation, allergies, principles of wound healing, cytology - processes in cells and their structure, biochemical processes in the body, wedge Diagnosis: basics of history taking and clinical research of animals, microbiology, virology: types of pathogens (microorganisms, viruses, protozoa) and their effects on the body, parasitology, zoology: types of parasites (helminths, protozoa), obstetrics: hormonal processes in the body. MS "Vet. Pharmacology "is the basis for the study of the following OK: Therapy (Internal Diseases of Animals), Clinical Pharmacology, Epizootology, Parasitology, Obstetrics, Surgery. In the study of OK "Vet. pharmacology "restrictions, coincidence with other OK and elective disciplines is absent
16	The policy of academic integrity	SNAU Code of Academic Integrity:: http://docs.snau.edu.ua/documents/education/quality/kodeks_akadem_dobrochesnosti.pdf
17	Link in Moodle	1. https://cdn.snau.edu.ua/moodle/course/view.php?id=3343 2. SNAU Vet pharm for forieng students: https://www.facebook.com/groups/1757475244370215/

LEARNING OUTCOMES (PLOs)

MLOs: On successful completion of the module the learner will be able to:	PLOs						How assessed
	PLOs N 1	PLOs N 2	PLOs N 7	PLOs N 10	PLOs N 14	PLOs N 15	
MLOs 1. Know the basic pharmacological and prescription terms, dosage forms and basics of technology of their manufacture and practical application, basics of prescribing, principles of dosing and calculation of doses of drugs of different dosage forms and dissolution of antibiotics	+						1. Workbook №1 (study of theoretical issues presented in the workbook, the design of prescription by example, the formation of the practical part on the use of various dosage forms). 2. Testing (Moodle platform). 3. Test work on recipes 4. Individual work (VTS) for the 5th semester of studying OK - calculation of doses, prescribing in a workbook
MLOs 2. Clearly understand the classification and distribution of drugs according to pharma . groups, taking into account the affiliation of active substances and their characteristic farms . effects regardless of the variety of drug companies		+					1. Workbook №2 (discharge main representatives of modern drug manufacturers to farm . Groups, analysis of pharmacodynamic , Pharm . Effects accordance farm . Groups over the semester, where we study all the available farm . Groups and their representatives). 2. Testing (Moodle platform). 3. Oral delivery of drugs (drugs able to call representatives of the farm . Group, their characteristic farm . Effects and performance features) 4. Individual work - VTS (project) for the 6th and 7th semesters of studying OK - preparation of a video about one of the farms . groups with examples of drugs from different manufacturers and typical farms . effects, features of application of this group in practice
MLOs 7. Be able to choose rational drugs or groups of drugs taking into account the characteristics of farms . effects depending on the species, age, sex, breed of animal, technology of cultivation and operation, epizootic situation, biogeochemical habitats			+				1. Reference syllabus (conducted during lectures - notes of basic terms and concepts on general pharmacology - the distribution of drugs in the body, the dependence of drugs on various factors). 2. Testing (Moodle platform). 3. Oral delivery of drugs (be able

of animals						to identify the key representatives of the farm . Group, their characteristic farm . Effects and performance features) taking into account specific features of individual animals.	
MLOs 10. To be able to rationally choose drugs or groups of drugs based on causal , pathogenetic, symptomatic, substitution therapy based drugs specific to farm . effects. Analyze and prevent (predict) possible side effects (allergic reactions, overdose), control antibiotic resistance , drug addiction				+		1. Reference syllabus (conducted during lectures - notes of basic terms and concepts on general pharmacology - the distribution of drugs in the body, the dependence of drugs on various factors). 2. Testing (Moodle platform).	
MLOs 14. Know the processes of biotransformation of drugs in the body taking into account physico- biochemical factors through biological membranes, their absorption, manifestation of effect, inactivation, excretion and correction (inactivation time) - the ability of drugs to affect the quality and processing of biological raw materials					+	1. Reference syllabus (conducted during lectures - notes of basic terms and concepts on general pharmacology - the distribution of drugs in the body, the dependence of drugs on various factors). 2. Testing (Moodle platform).	
MLOs 15. Know the basic rules of storage of drugs, time of their operation, routes of administration depending on the chemical origin, concentration and structure of body tissues. Understand the concept of their interaction (synergism, antagonism) in a syringe (in vitro) and a biological object (in vivo) both separately and with the simultaneous introduction into the animal and the risks of side effects, inactivation of drugs or increased effects						+	1. Workbook №1 (study of theoretical issues in the workbook on storage, rules for the sale of drugs; the basics of pharmacy). 2. Reference syllabus (conducted during lectures - notes of basic terms and concepts on general pharmacology - synergism, drug antagonism). 3. Testing (Moodle platform).

3. MODULE INDICATIVE CONTENT

Autumn semester

Topics	Distribution of hours			Self-directed study	Learning resources
	Lectures	Practicals	Labs		
<p>Topic 1. General pharmacology and formulation.</p> <p>1. Introduction. The subject and tasks of pharmacology. History of pharmacology.</p> <p>2. Pharmacological. The mechanism of action of medicinal substances. Types of pharmacotherapy.</p> <p>3. Ways of administration of medicinal substances. Absorption, distribution, biotransformation.</p> <p>4. Physicochemical factors of penetration of drugs through membranes. Metabolism of drugs: recovery, hydrolysis, conjugation. Removal of medicinal substances from the body.</p> <p>5. Types of action of medicinal substances. Excitation, oppression, resorptive action, direct and indirect, general, selective.</p> <p>6. Factors affecting the effect of drugs. Side effects. Features of drugs for repeated administration (cumulation, synergism, antagonism).</p> <p>7. The dose. The principle of dosing of drugs to animals. Dosage, depending on the chemical structure of drugs, dosage form, type, sex, age, general condition, various conditions.</p> <p>8. Pharmacopoeia. General concepts of compounding. Recipient terms. The doctrine of recipes. Use of Latin terms and abbreviations in the recipe.</p> <p>9. The structure of the recipe. Simple and complex recipes. Rules and schemes of prescription writing.</p> <p>10. Solid, soft and liquid dosage forms. Their types and prescriptions in prescriptions.</p> <p>11. The concept of a pharmacy.</p> <p>12. Latin abbreviations.</p>	2		3	40	1-18
<p>Special pharmacology. Drugs acting on the nervous system.</p> <p>Topic 2. Special pharmacology. Drugs acting on the central nervous system (CNS).</p> <p>1. General characteristics of drugs that affect the central nervous system. Means that depress the central nervous system (CNS). The concept of psychotropic drugs, their classification. Psychotropic drugs: tranquilizers, sedatives, sleeping pills, bromides, neuroleptics, muscle relaxants.</p> <p>2. Stages of anesthesia. Inhalational drugs.</p> <p>3. Non-inhaling drugs. Barbiturates (hexenal, thiopental, barbitol). Alcohol.</p> <p>4. Narcotic analgesics. Non-narcotic analgesics. Other analgesics.</p> <p>5. Psychostimulants. Analeptics. Preparations of strychnine acting on the spinal cord.</p>	2		3	40	1-18

<p>Topic 3. Remedies acting on the peripheral nervous system suppressing both excitatory and efferent nervous system.</p> <ol style="list-style-type: none"> 1. Locally anesthetizing. Enveloping. Soothing. Astringents. Adsorbents. Enterosorbents. 2. Protein preparations. Antidiarrhoeal preparations. Rehydration preparations. Antiemetic. 3. Annoying. Bitterness is pure, aromatic. Expectorants. Ruminatory. Preparations for improving digestion. Emetic. 4. Cholagogue. Hepatoprotectors. 5. Laxatives. 6. Holinomimetiki: carbacholin, proserin, arecoline, cititon. 7. Holinolytics: atropine sulfate, platyphylline, spasmolitin. 8. Adrenergic drugs. (Adrenaline, ephedrine and others). 					
TOGETHER	4		6	80	

Spring semester

Topics	Distribution of hours			Self-directed study	Learning resources
	Directed study				
	Lectures	Practicals	Labs		
<p>Special pharmacology. Drugs that act on the heart and blood. The Diuretics.</p> <p>Topic 4.: Special pharmacology. Drugs that act on the heart and blood.</p> <ol style="list-style-type: none"> 1. Cardiac glycosides. Classification. Concepts. 2. Distribution, schemes of application of cardiac glycosides. 3. Antiarrhythmic drugs. 4. Drugs affecting the metabolism in the myocardium. 5. Drugs that affect blood clotting. Coagulants, anticoagulants. 6. Blood substitutes. Their kinds. Dosage for parenteral nutrition. <p>Theme 5: Diuretic drugs.</p> <ol style="list-style-type: none"> 1. Diuretic drugs. Their classification. Features of groups. 	2			20	1-18
<p>Content module 4. Special pharmacology. Drugs that affect metabolism, immunity.</p> <p>Topic 5. Drugs affecting metabolism, immunity.</p> <ol style="list-style-type: none"> 1. The physiological role of vitamins, the classification of vitamin preparations. 2. Preparations containing fat-soluble vitamins A, D, E, K. Features of the mechanism of action. Indicators for use. 3. Water-soluble vitamins. B group vitamins are basic (B1, B6, B12) and other vitamin B preparations. Vitamin C is ascorbic acid. 4. Multivitamin preparations. 5. Enzyme preparations, their classification, 			2	20	1-18

application. Amino acids and their characteristics. Bacterial preparations (probiotics), their characteristics. 6. Hormonal drugs. 7. Preparations of macrocars and trace elements.					
Topic 6. Antimicrobial (drugs). 1. The concept of "antimicrobial drugs", their distribution, classification. 2. sulfonamide preparations. 3. Nitrofurans preparations. 4. Antibiotics. General concepts. Sources of receipt. Classification. Need for application. Features of the main pharmacological groups of antibiotics. 5. Anti-protozoal. 6. Coccidiostatics.	2		2	20	1-18
Topic 7. Antiseptic and disinfectants. 1. Classification of disinfectants and antiseptics. 2. Preparations, give oxygen. Preparations of iodine. 3. Phenols, cresols and their derivatives. 4. Group of formaldehyde, sulfur. 5. Modern disinfectants.				10	1-18
Topic 8. Inject-acaricidini and anthelmintic agents. 1. Inject-acaricidal. Pharmacological groups. Dosage forms. Rules of use. 2. Anthelmintics. Pharmacological groups. Group a vermect init. Rules of use. 3. Deratization means.			2	10	1-18
TOGETHER	4		6	80	

4. TEACHING AND LEARNING METHODS

MLOs	Teaching methods (directed study)	Hours	Learning methods (self-directed study)	Hours
DRN 1. Know the basic pharmacological and prescription terms, dosage forms and basics of technology of their manufacture and practical application, basics of prescribing, principles of dosing and calculation of doses of drugs of different dosage forms and dissolution of antibiotics	1. Lecture, story, explanation, instruction, work with books and other sources 2. Demonstration of basic dosage forms, technology of their manufacture and their features in practical application. 3. Learning the basic principles of calculating the doses of drugs of different dosage forms; rules for dissolving antibiotics	4	1. Design of a workbook №1, recipes according to examples during the hospital. 2. Study of theoretical issues presented in the workbook. 2. Testing (Moodle platform). 3. Execution of control work according to recipes. 4. Preparation of individual work (VTS) - calculation of doses, prescribing . notebooks	20
DRN 2. Clearly understand the classification and distribution of drugs according to pharma. groups, taking into	1. Lecture, story, explanation, instruction, work with books and other sources in order to teach rational choice of drugs.	4	1. Design of a workbook №2 (prescribing the main representatives of drugs of modern manufacturers by pharmaceutical groups;	40

<p>account the affiliation of active substances and their characteristic farms. effects regardless of the variety of drug companies</p>	<p>2. Training and analysis of pharmacological groups of drugs, active substances of drugs, taking into account their belonging to different farms. groups. Evaluation of farms. effects of farms. groups</p> <p>3. Demonstration of different pharmacological groups of drugs and their representatives from different farms. companies.</p>		<p>analysis of characteristic pharmaceutical effects according to pharmaceutical groups during semesters, where all available pharmaceutical groups are studied).</p> <p>2. Testing (Moodle platform).</p> <p>3. Oral delivery of drugs (be able to name the main representatives of the pharmaceutical group, their characteristic pharmaceutical effects and features of action).</p> <p>4. Preparation of individual work - VTS (project) for the 6th and 7th semesters of studying OK - a video about one of the farms. groups with examples of drugs from different manufacturers and typical farms. effects, features of application of this group in practice</p>	
<p>PRN 7. To be able to choose rational drugs or groups of drugs taking into account features of farms. effects depending on the species, age, sex, breed of animal, technology of cultivation and operation, epizootic situation, biogeochemical habitats of animals</p>	<p>1. Lecture, story, explanation, instruction, work with books and other sources in order to teach rational choice of drugs.</p> <p>2. Training and analysis of pharmacological groups of drugs, active substances of drugs, taking into account their belonging to different farms. groups. Evaluation of farms. effects of different farms. groups.</p> <p>3. Demonstration of different pharmacological groups of drugs and their representatives of different pharmacies. companies.</p>	<p>2</p>	<p>1. Preparation carts outline (conducted during lectures - Zanoah tovuv ment of key terms and concepts on general pharmacology - drug distribution in the body of drugs depending on various factors).</p> <p>2. Testing (Moodle platform).</p> <p>3. Oral delivery of drugs (be able to name the main representatives of the pharmaceutical group, their characteristic pharmaceutical effects and features of action).</p>	<p>10</p>
<p>DRN 10. Be able to rationally choose drugs or groups of drugs depending on the etiotropic, pathogenetic, symptomatic, substitution therapy, taking into account the drugs</p>	<p>1. Lecture, story, explanation, instruction, work with books and other sources in order to teach rational choice of drugs.</p> <p>2. Analysis of pharmacological effects of</p>	<p>2</p>	<p>1. Preparation of a reference syllabus (conducted during the lectures - notation of basic terms and concepts.</p> <p>2. Testing (Moodle platform).</p> <p>3. Oral (individual or group)</p>	<p>10</p>

characteristic of drugs. effects. Analyze and prevent (predict) possible side effects (allergic reactions, overdose), control antibiotic resistance, drug addiction	drugs during their passage and interaction with the body. 3. Demonstration of different pharmacological groups of drugs and their representatives of different pharmacies. companies.		team interview, analysis of situational tasks	
DRN 14. Know the processes of biotransformation of drugs in the body taking into account physico-biochemical factors through biological membranes, their absorption, manifestation of effect, inactivation, excretion and correction (time of inactivation) - the ability of drugs to affect the quality and processing of biological raw materials	1. Lecture, story, explanation, instruction, work with books and other sources in order to teach rational choice of drugs. 2. Analysis of pharmacological effects of drugs during their passage and interaction with the body. 3. Demonstration of different pharmacological groups of drugs and their representatives of different pharmacies. companies.	4	1. Preparation of a reference syllabus (conducted during the lectures - notes of basic terms and concepts. 2. Testing (Moodle platform). 3. Oral (individual or group) team interview, analysis of situational tasks	20
DRN 15. Know the basic rules of storage of drugs, time of their operation, routes of administration depending on the chemical origin, concentration and structure of body tissues. Understand the concept of their interaction (synergism, antagonism) in a syringe (in vitro) and a biological object (in vivo) both separately and with the simultaneous introduction into the animal and the risks of side effects, inactivation of drugs or enhancement of effects that occur	1. Lecture, story, explanation, instruction, work with books and other sources in order to teach rational choice of drugs. 2. Analysis of pharmacological effects of drugs during their passage and interaction with the body, interaction with each other, prediction of side effects . 3. Demonstration of different pharmacological groups of drugs and their representatives of different pharmacies. companies.	4	1. Preparation of a reference syllabus (conducted during the lectures - notes of basic terms and concepts. 2. Testing (Moodle platform). 3. Oral (individual or group) team interview, analysis of situational tasks	20
Approximate distribution of hours on 6 credits (180 hours)		20		160

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1. Summative assessment:

№	Methods of summative evaluation	Points / Weight in the overall score	Date of compilation
5th semester			
1	Preparation of a reference syllabus on the basic terms and concepts when attending lectures	10 points / 10%	at the end of each topic
2	Study of theoretical questions and control of their knowledge during testing on the Moodle platform	10 points / 10%	at the end of each topic
3	Oral delivery of drugs by pharmacological groups	20 points / 10%	at the end of each topic
4	Registration of workbook № 1 (prescription, pharmacies, dosage forms) during laboratory-practical classes	20 points / 20%	at the end of each topic
5	Execution of control work on calculation of doses of drugs (prescription)	10 points / 20%	at the end of each topic
6	Preparation of an individual task in the workbook № 1 - VTS according to the recipe and calculation of drug doses	15 points / 15%	at the end of each topic
7	Intermediate certification (multiple choice test)	15 points / 15%	according to the schedule
<i>Form of control - offset, together</i>		<i>60-100 points / 60-100%</i>	
6 semester			
1	Design of workbook № 2 (pharmaceutical group of drugs) during lectures and laboratory-practical classes	10 points / 20%	at the end of each topic
2	Study of theoretical questions and control of their knowledge during testing on the Moodle platform	10 points / 20%	at the end of each topic
3	Oral delivery of drugs by pharmacological groups	20 points / 30%	at the end of each topic
4	Preparation of individual work - VTS (project) for the 7th semester of studying OK - a video about one of the farms. groups with examples of drugs from different manufacturers and typical farms. effects, features of application of this group in practice	15 points / 15%	at the end of each topic
5	Intermediate certification (multiple choice test)	15 points / 15%	according to the schedule
6	Comprehensive exam (testing, ticket assignments, delivery of drugs, prescription)	30 points / 30%	according to the schedule
<i>Form of control - exam, together</i>		<i>60-100 points / 60-100%</i>	

5. 2. Evaluation criteria

№	Component	Unsatisfactorily	Satisfactorily	Good	Excelent
1	Preparation of a reference syllabus on the basic terms and concepts when attending lectures	Task requirements not met	There are no separate components of the tasks	There are all the constituent elements of the tasks	There are all the constituent elements of the tasks, additional literature
2	Study of theoretical questions and control of their knowledge during testing on the	Task requirements not met	Correct answers in 50-69% of tasks	Correct answers in 70-90% of tasks	Correct answers in 91-100% of tasks

	Moodle platform				
3	Registration of workbook № 1 (prescriptions, pharmacies, dosage forms) during laboratory-practical classes	Task requirements not met	There are no separate components of the tasks. Prescription are made selectively.	There are all the constituent elements of the tasks. The recipes are made completely with minor errors	There are all the constituent elements of the tasks. The recipes are made completely with minor corrections and without them
4	Execution of control work on calculation of doses of drugs (prescriptions)	Task requirements not met	Not all recipes are partially fulfilled. No calculations are given in the recipes	All recipes are executed with minor errors. Listed calculations in recipes	All recipes are made with minor corrections. Listed calculations in recipes in full
5	Design of workbook № 2 (pharmaceutical group of drugs) during lectures and laboratory-practical classes	Task requirements not met	The requirements of the tasks are partially fulfilled, the comparative tables of farms are partially designed. groups of drugs, the most basic examples of drugs	All requirements of tasks are fulfilled, all comparative tables of farms are issued. groups of drugs with examples of basic drugs	All requirements of tasks are fulfilled, all comparative tables of farms are issued. groups of drugs with examples of the main drugs of different manufacturers
6	Preparation of an individual task in the workbook № 1 - VTS according to the prescriptions and calculation of drug doses	Task requirements not met	The main part of the recipes is completed, there are errors in the design and calculations, the calculations are reduced to a limited number of recipes that need explanation	All prescriptions are executed, there are minor errors in design and calculations, calculations are given to all recipes that need explanation	All recipes are executed, there are minor errors in the design of recipes, calculations are given to all recipes that need explanation
7	Oral delivery of drugs by pharmacological groups	Task requirements not met	At the oral answer the farm is emphasized. group and farm. effects of not all proposed drugs	At the oral answer the farm is emphasized. group, pharma. Effects all proposed drugs.	At the oral answer the farm is emphasized. group, pharma. effects all proposed drugs with elements of comparison of drugs or farms. groups
8	Preparation of individual work - VTS (project) on 5-6-th semesters - a video about one of the farms. groups	Task requirements not met	The layout for the thematic video was used, the main points of the topic were covered, examples of drugs without a	The layout for the thematic video was used, the main points of the topic were covered, examples of drugs with a description	The layout for the thematic video was used, the main points of the topic were covered, examples of drugs with a description of belonging to farms

			description of belonging to farms were given. groups and pharmaceutical effects	of belonging to farms were given. groups and pharmaceutical effects	were given. groups and pharma. effects. Features of practical application of this group of drugs are separately allocated
9	Intermediate certification	Task requirements not met	Correct answers in 50-69% of tasks	Positive answers in 70-90% of tasks	Positive answers in 91-100% of tasks
10	Comprehensive exam	Task requirements not met	Partially completed all tasks (test, theoretical question, answer to drugs, prescribed, doses taken into account with errors in many tasks)	All tasks are fully completed (test, theoretical question, answer to drugs, prescription is written, doses with minor errors in some tasks and incomplete answers are taken into account)	Fully completed all setting (test theoretical question, the answer to drugs prescription written in ir ahovani doses without error in all tasks and incomplete responses)

5.3. Formative assessment elements:

(for self-analysis and assessment of learning progress)

№	Elements of formative assessment	Date / semester
1	The reference summary on the basic terms and concepts during attendance of lectures and LPZ is prepared	during 5-6 semesters
2	The main theoretical issues of MS were studied and the control of knowledge during testing on the Moodle platform was carried out	during 5-6 semesters
3	Workbook № 1 (prescription, pharmacies, dosage forms) was issued during laboratory-practical classes	during 5-6 semesters
4	Control work on calculation of doses of drugs (recipes) is executed	during 5-6 semesters
5	An individual task was prepared in the workbook № 1 - VTS according to the prescription and the calculation of doses of drugs,	during 5-6 semesters
6	Workbook № 2 (pharmaceutical group of drugs) was issued during lectures and laboratory-practical classes	during 5-6 semesters
7	Preparation of individual work - VTS (project) for 5 and 6 semesters - a video about one of the farms. groups	during 5-6 semesters
8	Participated in the intermediate certification (multiple choice test) on the Moodle platform	during 5-6 semesters
9	Preparation for a comprehensive exam (testing, ticket assignments, delivery of drugs, prescription)	during 6th semester

6. LEARNING RESOURCES

6.1. Key resources

1. **Handbook of Veterinary Pharmacology** / Walter H. Hsu, Professor of Pharmacology Department of Biomedical Sciences College of Veterinary Medicine Iowa State University Ames, Iowa // Edition first published 2008 © 2008 Wiley-Blackwell
(Руководство. Ветеринарная фармакология)
2. **Veterinary Drug Handbook**, 7th Edition / Donald C. Plumb, Pharm.D // distributed by Blackwell Publishing, COpyriGHt © 2008 by donald C. Plumb
(Руководство к ветеринарным препаратам)
3. **A Textbook of Clinical Pharmacology and Therapeutics** / JAMES M RITTER, LIONEL D LEWIS, TIMOTHY GK MANT, ALBERT FERRO // This fifth edition published in Great Britain in 2008 by London School of Medicine, Guy's, King's and St Thomas' Hospitals, London, UK©2008 James M Ritter, Lionel D Lewis, Timothy GK Mant and Albert Ferro
(Учебник по клинической фармакологии и терапии)
4. **Veterinary Pharmacology and Therapeutics**, Ninth Edition / Jim E. Riviere, DVM, PhD, DSc (hon); Mark G. Papich, DVM, MS; Consulting Editor H. Richard Adams, DVM, PhD, Diplomate ACVECC (Hon) // Ninth Edition first published 2009, © 2009 Wiley-Blackwell
(Ветеринарная фармакология и терапия)
5. SAUNDERS HANDBOOK OF VETERINARY DRUGS: SMALL AND LARGE ANIMAL, THIRD EDITION
Copyright © 2011, 2007, 2002 by Saunders, an imprint of Elsevier Inc.
(Руководство по Ветеринарной фармакологии для мелких и крупных животных)

6.2. Guidelines

6.	Handbook of Veterinary Pharmacology / Walter H. Hsu, <i>Professor of Pharmacology Department of Biomedical Sciences College of Veterinary Medicine Iowa State University Ames, Iowa</i> // Edition first published 2008 © 2008 Wiley-Blackwell	https://www.google.ru/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjKv6KxgY_XAhXoQpoKHYJpAMgQFggvMAA&url=http%3A%2F%2Ffiles.books.elebd3.net%2Fdownload-pdf-ebooks.org-kupd-541.pdf&usg=AOvVaw2D4Rp4GpykmLhCFLip_FNY
7	Veterinary Drug Handbook , Sixth Edition/Donald C. Plumb, Pharm.D // distributed by Blackwell Publishing, COpyriGHt © 2008 by donald C. Plumb	https://www.google.ru/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjuvsvDgY_XAhVpCZoKHYBZB2UQFgg0MAE&url=http%3A%2F%2Fdownload-pdf-ebooks.online%2Ffiles%2Fdownload-pdf-ebooks.org-kupd-190.pdf&usg=AOvVaw2iT5JCld0jgDBZJx6IYW http://download-pdf-ebooks.online/files/download-pdf-ebooks.org-kupd-190.pdf
8	Pain Management in Small Animal Medicine / Steven M Fox, MS, DVM, MBA, PhD Surgical Specialist: New Zealand VMA Independent Consultant, Clive, Iowa USA Adjunct Assistant Professor, College of Veterinary Medicine, University of Illinois Adjunct Associate Professor, Massey University NZ Program Chairman (2000-	https://www.google.ru/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwilzciig4_XAhXsCJoKHWggCIAQFggIMAA&url=https%3A%2F%2Fwww.crcpress.com%2FPain-Management-in-Small-Animal-Medicine%2FFox%2Fp%2Fbook%2F9781840761832&usg=AOvVaw3BCvacLDIX8oz19La1Q

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9	A Textbook of Clinical Pharmacology and Therapeutics / JAMES M RITTER, LIONEL D LEWIS, TIMOTHY GK MANT, ALBERT FERRO // This fifth edition published in Great Britain in 2008 by London School of Medicine, Guy's, King's and St Thomas' Hospitals, London, UK©2008 James M Ritter, Lionel D Lewis, Timothy GK Mant and Albert Ferro	https://www.google.ru/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiwvd-moXAhWsDpoKHeJ-DMEQFgglMAA&url=http%3A%2F%2Fwww.pharmaresearchlibrary.com%2Fwp-content%2Fuploads%2F2013%2F03%2FA-Textbook-of-Clinical-Pharmacology-and-Therapeutics-5th-edition.pdf&usg=AOvVaw1vEgH4Mw565GlzupomjVY9
10	Small Animal Clinical Pharmacology Bk / An imprint of Elsevier Limited // © Elsevier Limited 2008. All rights reserved.	http://govelobook.top/2nlw3books_ml/small-animal-clinical-pharmacology-and-therapeutics-2ed-pb-2012.pdf
11	Pharmacology. Workbook for practical classes for foreign students (General medicine) / V.I. Mamchur, A.A. Nefedov, V.I. Opryshko, A.E. Lievykh, E.A. Nefedova, E.V. Khomiak. – Dnipropetrovsk: «Serednyak T.K.», 2014. – 134 p.	ftp://ftp.dsma.dp.ua/209/ENG/Modules/Pharmacology/Library/Workbook%202015.pdf
12	Zoo animal and wildlife immobilization and anesthesia / Gary West, DVM, Dipl ACZM, Darryl Heard, BSc, BVMS, PhD, Dipl ACZM, Nigel Caulkett, DVM, MVetSc, Dipl ACVA // ©2007 Blackwell Publishing Chapters 23, 33, and 43 remain with the U.S. Government All rights reserved	http://szb.org.br/blog/conteudos/bibliografias/06-veterinaria/zoo-animal-wildlife-immobilization-and-anesthesia.pdf
13	Veterinary Drugs / Dr. Barry BOUSFIELD and Dr. Richard BROWN // July 2012, Volume No. 1 Issue No. 9.	
14	Drug Compounding for Veterinary patients / mark g. papich // <i>The AAPS Journal</i> 2005; 7 (2) Article 29 (http://www.aapsj.org).	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2750966/
15	Prescription writing and record keeping requirements for a veterinary practitioner / Frank O'Sullivan, Chairman, One Health Committee, Veterinary Ireland // <i>Veterinary Ireland Journal</i> Volume 64 Number 4.	http://www.veterinaryirelandjournal.com/oldsite/Links/PDFs/CE-Large/CELA_apr_2011.pdf
16	Anesthesia and Pain Management in Dogs and Cats / Jeff C Ko DVM, MS, DipACVA // Copyright © 2013 Manson Publishing Ltd	https://www.westernu.edu/bin/veterinary/vet-anesthesia-analgesia/perioperative-pain-management.pdf http://www.vasg.org/ https://www.aaha.org/professional/resources/pain_management.aspx
17	Practitioner's Manual An Informational	http://www.asipp.org/documents/PractitionersMa

	Outline of the Controlled Substances Act / United States Department of Justice Drug Enforcement Administration Office of Diversion Control // 2006	nual.pdf
18	English-Russian and Russian-English Dictionary of Toxicology Англо-русский и русско-английский токсикологический словарь / Вольфберг Д. М., Лойт А. О. словарь: Ок. 6 000 терминов / Д. М. Вольфберг, А. О. Лойт. — СПб.: Филологический факультет СПбГУ; М.: Издательский центр «Академия», 2005. — 288 с.	http://academia-moscow.ru/ftp_share/_books/fragments/fragment_18448.pdf
19	Drug Therapy for Infectious Diseases of the Dog and Cat / Valerie J. Wiebe // This edition first published 2015 © 2015 by John Wiley & Sons, Inc	http://www.mediafire.com/file/0q7v3hmo2f7kugm/Drug+Therapy+for+Infectious+Diseases+of+the+Dog+and+Cat.pdf
20	Ukrainian-Russian-English Dictionary of Basic Veterinary Terms. First edition / Sumy, 2017,. 88 p. Terms. First edition / Sumy, 2017,. 88 p.	Sumy National Agrarian University. Veterinary medicine Department. The Chair of Therapy, Pharmacology and Clinical Diagnostics.
21	Veterinary pharmacology. Prescription. Different pharmaceutical forms: methodical manual for laboratory and practical training and self-study of the 2 nd and 3 rd year foreign students; specialization in Veterinary Medicine, full-time education / Sumy, 2017, 88 p.	Sumy National Agrarian University. Veterinary medicine Department. The Chair of Therapy, Pharmacology and Clinical Diagnostics.

6.3. Additional resources

1.	Romich, J.A. Pharmacology for Veterinary Technicians, 2 nd edition. 2010.
2.	Bill, R.L. Clinical Pharmacology and Therapeutics for the Veterinary Technician, 3 rd edition. 2006.
3.	Bill, R.L. Medical Mathematics and Dosage Calculations for Veterinary Professionals, 2 nd edition. 2009.
4.	http://www.youtube.com/watch?v=YEYheg3AEWY
5.	http://www.youtube.com/watch?v=YEYheg3AEWY
6.	http://www.youtube.com/watch?v=BHv_vji9MtQ
7.	http://www.youtube.com/watch?v=ZxusMGeuupk&feature=related
8.	http://www.youtube.com/watch?v=0EwaIQ-U6QQ&feature=related
9.	http://www.youtube.com/watch?v=ZOkpVFKn-sA&feature=related
10.	http://www.msnbc.msn.com/id/35286379/ns/health-pet_health/t/when-vets-make-mistakes-pets-pay-price/
11.	http://www.fda.gov/AnimalVeterinary/ResourcesforYou/ucm214772.htm
12.	https://www.avma.org/KB/Policies/Pages/Guidelines-for-Veterinary-Prescription-Drugs.aspx
13.	https://www.rcvs.org.uk/advice-and-guidance/code-of-professional-conduct-for-veterinary-surgeons/supporting-guidance/veterinary-medicines/
14.	https://www.deadiversion.usdoj.gov/pubs/manuals/pract/pract_manual012508.pdf
15.	https://www.pinterest.com/pin/350506783483752161/
16.	http://lorrainespharmacy.com/compounding/suppositories.htm
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18.	http://www.msnbc.msn.com/id/35286379/ns/health-pet_health/t/when-vets-make-mistakes-pets-pay-price/

[price/](#)

19. <http://www.fda.gov/AnimalVeterinary/ResourcesforYou/ucm214772.htm>
20. <https://www.avma.org/KB/Policies/Pages/Guidelines-for-Veterinary-Prescription-Drugs.aspx>
21. <https://www.rcvs.org.uk/advice-and-guidance/code-of-professional-conduct-for-veterinary-surgeons/supporting-guidance/veterinary-medicines/>
22. https://www.deadiversion.usdoj.gov/pubs/manuals/pract/pract_manual012508.pdf
23. <https://www.pinterest.com/pin/350506783483752161/>
24. <http://lorrainespharmacy.com/compounding/suppositories.htm>
25. http://intranet.tdmu.edu.ua/data/kafedra/internal/lik_tex/classes_stud/en/pharm/prov_pharm/ptn/Pharmaceutical%20drugs%20technology/3/13.%20Infusions%20and%20decoctions%20from%20extracts%20-%20concentrates.htm

6.4. Computer Applications and soft

1. [SNAU Vet pharm for forieng students: https://www.facebook.com/groups/1757475244370215/](https://www.facebook.com/groups/1757475244370215/)
2. <https://cdn.snau.edu.ua/moodle/course/view.php?id=3343>

6.1. Key resources

1. Clinical Pharmacology and Therapeutics for Veterinary Technicians 4th Edition by Robert L. Bill DVM PhD (Author)
2. American College of Veterinary Clinical Pharmacology / <https://www.acvcp.org>
3. Jornal of Clinical Pharmacology and Therapeutics. What a veterinary graduate should know about basic and clinical pharmacology: A Delphi study to finalize day-1 competencies / <https://onlinelibrary.wiley.com/doi/10.1111/jvp.12920>

Research-in-veterinary-clinical-pharmacology

<https://fvas.unimelb.edu.au/research/groups/past/tracts/research-in-veterinary-clinical-pharmacology>