Додаток 2
До Процедури розробки та періодичного перегляду освітніх програм

Pharmacology department

1. General information	
Faculty	Medical faculty № 2
Educational programme	22 Health care , 222 Medicine, educational qualification «Master of medicine», full-time
Academic year	2023-2024
Subject	Pharmacology OK 16, *https//new.meduniv.lviv.ua/kafedry/kafedra-farmakologiyi/*
Department	Pharmacology department 70010 Lviv, 69, Pekarska. +380322767821, *e-mail* Kaf_pharmacology@meduniv.lviv.ua
Head of the department	Pinyazhko O.R., MD, PhD, PSc (in medicine) , Professor olehpinyazhko@gmail.com
Year of studying	third
Semester	Fifth, sixth
Type of the subject	Obligatory
Teachers	Ass. Prof. Havrylyuk I.M. MD, PhD,iryna_havrylyuk@ukr.net, Ass. Prof. Poshyvak O.B. MD, PhD olesya.poshyvak@gmail.com
Erasmus	No
Responsible for syllabus	Ass. Prof. Havrylyuk I.M. MD, PhD,iryna_havrylyuk@ukr.net, Prof. Pinyazhko O.R., MD, PhD, PSc olehpinyazhko@gmail.com
Credits ECTS	7
Hours	Lectures – 34, practicals-70, self-study work - 106
Lnguadge	English
Consultations	According to the schedule

2. Short annotation of the course

The subject of pharmacology are interactions taking place between drugs and living organisms;. use of drugs for the treatment and prophylaxis of diseases.
Pharmacology provides the basis for studying clinical subjects, involves integration with these subjects and is intended to develop skills of applying knowledge of pharmacology in further studying and professional activity.

3. Aim and learning objectives

1. **The aim of studying pharmacology** is development of theoretical knowledge and formation of practical skills related to principles of justification of rational medicines use for the treatment and prophylaxis of diseases. Achieving this goal would provide preparing of students for their professional activity, qualitative performance of functional obligations related to justification of rational medicines use**,** formulation of treatment regimens with their further implementation.
2. The main learning objective is generation of knowledge of pharmacological groups of drugs, their pharmacokinetics, pharmacodynamics, adverse effects, symptoms of drugs overdose, clinical indications, interactions with other drugs, formation of skills of prescribing drugs in different dosage forms.
3. Competencies
According to the requirements of High Education Standard discipline pharmacology provides formation of students competencies:
Integral
ability to solve typical and complex practical problems in professional activity; to use obtained knowledge, skills, personal qualities, capabilities, values to meet the challenges of practical work.

General :

ЗК.1. Ability to abstract thinking, analysis and synthesis .
ЗК.2. Ability to learn and to achieve modern knowledge .
ЗК.3. Ability of using the acquired knowledge in practical situations.
ЗК.4. Ability to understand the subject area .
ЗК.6. Ability to make informed decisions
ЗК.7. Ability to work effectively in a team .
ЗК.8. Interpersonal skills
ЗК.11. Ability to use information and communication technologies
ЗК.12. Definiteness and persistence in tasks and responsibilities .
ЗК.13. Ability to act socially responsibly and consciously
ЗК.15 Ability to act on the basis of ethical considerations (motives)
Professional:
ФК.6 .Ability to determine principles and mode of treatment.
ФК.7. Ability to diagnose emergency
ФК.8. Ability to determine the tactics of emergency medical care
ФК.17. Ability to maintain medical documentation.
ФК.20.Ability to analyze activity of practioners and clinics, carry out enforcement activities to provide quality of medical care and maximize utilization of medical resources.

4. Preliminary requirements

Pharmacology is based on studying of:
1.Bioinorganic chemistry
2.Bioorganic chemistry
3.Biochemistry
4. Medical biology and parazitology
5.Normal anatomy
6.Normal physiology
7.Latin language

5. Programmed learning outcomes of the course

List of learning outcomes

Code	Content of the learning outcome	Matrix of competencies
ПР6	Determine principles and mode of treatment of disease	ЗК.1. ЗК.2.,ЗК.3, ЗК.4, ЗК.6, ЗК.7, ЗК.8, ЗК.11, ЗК.12, ЗК.13, ЗК.15, ФК.6, ФК.7, ФК.8, ФК.17, ФК.20.
ПР7	Determine the tactics of emergency medical care according to the diagnosis	ЗК.1. ЗК.2.,ЗК.3, ЗК.4, ЗК.6, ЗК.7, ЗК.8, ЗК.11, ЗК.12, ЗК.13, ЗК.15, ФК.6, ФК.7, ФК.8, ФК.17, ФК.20.
ПР16	Prepare report on the professional work; maintain documentation regarding patients and segment of the population	ЗК.1. ЗК.2.,ЗК.3, ЗК.4, ЗК.6, ЗК.7, ЗК.8, ЗК.11, ЗК.12, ЗК.13, ЗК.15, ФК.6, ФК.7, ФК.8, ФК.17, ФК.20
ПР17	Conduct screening for major non-communicable diseases; evaluate morbidity indicators, integrated health indicators; identify risk factors for the occurrence and course of diseases; to form risk groups of the population. Determine the source and / or location of the required information depending on its type; receive the necessary information from a specific source; process and analyze the received information	ЗК.1. ЗК.2.,ЗК.3, ЗК.4, ЗК.6, ЗК.7, ЗК.8, ЗК.11, ЗК.12, ЗК.13, ЗК.15, ФК.6, ФК.7, ФК.8, ФК.17, ФК.20
ПР21	Formulate objectives and determine the structure of personal activity	ЗК.1, ЗК.2, ЗК.4, ЗК.6.ЗК.12.ЗК.13
ПР23	Be aware of and be guided by civil rights,	ЗК.1., ЗК.2. ЗК.8, ЗК.13, ЗК.15

	liberties and obligations; increase level of general education and culture	
Knowledge		
Зн-1	Modern classifications of drugs	
Зн-2	Main pharmacokinetic and pharmacodynamic properties of pharmacological groups of drugs	
Зн-3	Main indications for clinical use of drugs	
Зн-4	Main types of adverse drug reactions	
Зн-5	Main symptoms of drug overdose	
Зн-6	Principles of drug interactions	
Зн-7	Structure of prescription and rules of its writing	
	Skills	
Ум-1	To use modern classifications of drugs	
Ум-2	To interpret pharmacokinetic and pharmacodynamic properties of drugs	
Ум-3	To use the knowledge gained in choosing indications for drugs clinical use	
Уь-4	To interpret development of adverse drug reactions and principles of their correction	
Ум-5	To use the algorithm of the management of the acute drug poisonong	
Ум-6	To analyze drug interactins	
Ум-7	To prescribe medications in different dosage forms	
	Competencies	
К-1	Ability to identify drugs according to modern classifications	
К-2	Ability to analyze pharmacokinetic and pharmacodynamic properties of drugs in each particular case of clinical use	
К-3	Ability to explain and justify clinical use of drugs, their dosage forms and routes of administration	
К-4	Ability to determine manifestations of possible drug adverse reactions, to prevent and treat these reactions	
К-5	Ability to generate the algorithm of management of acute drug poisoning, to understand the action of antidotes in each particular case	
К-6	Ability to determine possible drug interactions and their consequences	
К-7	Ability to use the knowledge gained for prescribing drugs in each particular case	
АВ-1	Be responsible for literacy in professional communication	
АВ-2	Be responsible for correct pharmacological interpretation of drugs action in patients of different age, with different diseases and treatment	
АВ-3	Be responsible for quality of prescribing drugs	
АВ-4	Be responsible for correct interpretation adverse drug reactions and their correction	
АВ-5	Be responsible for correct algorithm of management of acute drug poisoning	
АВ-6	Be responsible for correct interpretation of interaction of prescribed drugs	
АВ-7	Be responsible for correct writing of prescriptions taking into account dosage form, route of administration, clinical condition and accompanying diseases	
Code of learning outcome	Content of learning outcome	Matrix of competencies
Зн-1 Ум-1 К-1 АВ-1	Ability to identify drugs according to modern classifications	ПР6 ПР7 ПР17
Зн-2 Ум-2 К-2 АВ-2	Ability to analyze pharmacokinetics and pharmacodynamics of drugs	ПР6 ПР7
Зн-3 Ум-3 К-3 АВ-3	Ability to explain and justify the main clinical indications, adequate dosage forms and routes of administration of drugs	ПР6 ПР7
Зн-4 Ум-4 К-4 АВ-4	Ability to determine manifestations of possible drug adverse reactions, to prevent and treat these reactions	ПР6 ПР7
Зн-5 Ум-5	Ability to generate the algorithm of management of acute drug poisoning, to	ПР6 ПР7

К-5 АВ-5	understand the action of antidotes in each particular case	
Зн-6 Ум-6 К-6 АВ-6	Ability to determine possible drug interactions and their consequences	ПР6 ПР7
Зн-7 Ум-7 К-7 АВ-7	Ability to use the knowledge gained for prescribing drugs in each particular case	ПР23

6. Format and volume of the course

Format of the course	Full-time For studying pharmacology 210 hours (7 ECTS credits) are devoted: lectures - 34 hours, practicals - 70 hours, self-study work - 106 hours. Pharmacology course is divided into 6 sections: Section 1. General principles of prescription order writing. General pharmacology. Section 2. Pharmacology of drugs affecting the peripheral nervous system. Section 3. Pharmacology of drugs affecting the central nervous system." Section 4. Pharmacology of drugs affecting metabolism, inflammation and immunity Section 5. Pharmacology of drugs affecting major organ systems. Section 6. Pharmacology of chemotherapeutic agents

Type of classes	Hours	Number of groups
Lectures	34	11
Pracicals	70	35
Seminars	-	-
Self-study work	106	

7. Topics and content of the course

Code of the type of classes	Topic	Content	Code of learning outcome	Teachers
ЛІ-1	Introduction to pharmacology. Basic principles of pharmacokinetics and pharmacodynamics	Absorption, distribution, metablism, elimination of drugs. The main targets for drug action.	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
ЛІ-2	Introduction to pharmacology of autonomic nervous system. Cholinergic agonists. (direct and indirect acting)	M,N-cholinomimetics, M-cholinomimetics, N-cholinomimetics. Anticholinseterases. Pharmacological properties. Clinical use	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
ЛІ-3	Pharmacology of cholinergic antagonists	Muscarinic cholinergic antagonists. Ganglion-blocking drugs. Neuromuscular- blocking drugs . Pharmacological properties. Clinical use	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
ЛІ-4	Pharmacology of adrenergic agonists	Alpha, beta-adrenomimetics. Alpha-adrenomimetics. Beta-adrenomimetics. . Indirect acting adrenomimetics. Pharmacological properties. Clinical use	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

Л-5	Pharmacology of adrenergic antagonists.	Alpha, beta-adrenoblockers.. Alpha-adrenoblocker. Beta-adrenoblockers. . Indirect acting adrenoblockers. Pharmacological properties. Clinical use	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-6	Pharmacology of analgesics. Narcotic (opioid) analgesics. Non-narcotic analgesics.	Comparative characteristic of opioid and nonnarcotic analgesics. Pharmacological properties. Clinical use	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-7	Antipsychotic drugs. Anxiolytic and sedativec drugs	Comparative pharmacology of antipsychotic ,nxiolytic and sedativec agents. Role in the treatment of mental diseases	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-8	Drugs used in affective disorders	Pharmacology of antidepressants and litium salts. Role in the treatment of affective disorders	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-9	Drugs used to treat congestive heart failure. Cardiac glycosides	Positive inotropic agents. Pharmacology of cardiac glycosides	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-10	Antianginal drugs. Antiarrhythmic drugs	Comparative characteristic of the main groups of antianginal and antiarrhythmic drugs	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-11	Antihypertensive drugs. Diuretics.	Comparative pharmacology of the main groups of antihypertensive drugs. Comparative pharmacology of the main groups of diuretics	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-12	Drugs affecting thrombus formation and fibrinolysis.	Pharmacology of drugs affecting blood clotting, platelet aggregation and fibrinolysis. Role in the treatment of thrombosis and bleeding. .	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-13	Drugs affecting the gastrointestinal tract	Classification of drugs. Pharmacology of drugs used to treat peptic ulcer	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-14	Drugs affecting folate metabolism. Fluoroquinolones.	General principles of antimicrobial chemotherapy. Pharmacology of sulphonamides and fluoroquinolones	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-15	Antibiotics – cell wall synthesis inhibitors. .	Pharmacology of penicillins, cephalosporins, carbapenems, monobactams, carbapenems, glycopeptides	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-16	Antibiotics – protein synthesis inhibitors	Pharmacology of tetracyclins, aminoglycosides, macrolides, lincozamides, phenicols, polimixins	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
Л-17	Antimycobacterial drugs. Antifungal drugs.	Principles of chemocherapy of tuberculosis. Antituberculous agents of the first and second line. Pharmacology of	Зн-1-6 Ум- 1-6 К-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

		antifungal agents		
П-1	General principles of prescribing drugs. Solid and semisolid drug dosage forms	Prescription, its structure. General principles of Рецепт: струкprescribing drugs. Solid dosage forms. (powders, tablets, dragee, capsules, suppositories). Semisolid dosage forms (ointments, pastes, liniments).	Зн-7 Ум-7 АВ-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-2	Liquid drug dosage forms	Infusions, decoctions, tinctures, fluidextracts, mixtures, solutions for internal, external and parenteral administrarion	Зн-7 Ум-7 К-7 АВ-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-3	Control work on prescription order writing	Control of practical skills in writing prescriptions	Зн-7 Ум-7 К-7 АВ-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-4	Basic principles of pharmacokinetics Контрольна робота з рецептури.	General principles of absorption, distribution, metabolism and elimination of drugs. Routes f drugs adminisration	Зн-2 Ум-2 Л-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-5	Basic principles of pharmacodynamics	Mechanisms of action of drugs. Adverse effects of drugs.. Dosing of drugs	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-6	Drugs affecting afferent innervation	Local anesthetics. Astringents. Coating agents. Adsorbents. Irritating agents. Local anesthetics Classification. Mechanism of action. Pharmacological effects. Clinical use. Adverse effects	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-7	Cholinergic agonists.	Classification of cholinomimetics. Mechanism of action.Pharmacological effects. Clinical use. Adverse effects. Anticholinesterase poisoning and its treatment	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-8	Cholinergic antagonists	Classification of cholinoblockers. Mechanism of action.Pharmacological effects. Clinical use. Adverse effects. Atropine poisoning and its treatment. Termination of action of neuromusculsr blocking agents.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-9	Adrenergic agonists	Classification of adrenomimetics. Mechanism of action.Pharmacological effects. Clinical use. Adverse effects. Role in emergency medical care	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-10	Adrenergic antagonists.	Classification of adrenoblockers. Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Role in the treatment of cardiovascular diseases.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

П-11	Final test “Drugs affecting the peripheral nervous system”	Control of practical skills in writing prescriptions and providing rational choice of drugs to correct the function of the peripheral nervous system	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-12	Sedative-hypnotic drugs. Alcohols. Antiepileptic drugs. Drugs used to treat Parkinson’s disease.	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Poisoning with hypnotic drugs and its treatment. Methanol poisoning and its treatment. Drugs used to treat alcoholism	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-13	Narcotic (opioid) analgesics	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Symptoms of opioid analgesics poisoning and its treatment.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-14	Non-narcotic analgesics.	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Symptoms of paracetamol and aspirin poisoning, its treatment.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-15	Antipsychotic drugs. Anxiolytic and sedative drugs	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Symptoms of overdose and its treatment	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-16	Final test “Drugs affecting the central nervous system”	Control of practical skills in writing prescriptions and providing rational choice of drugs to correct the function of the central nervous system	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-17	Vitamins	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Symptoms of overdose and its treatment	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-18	Hormones, their analogs and antagonists.	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-19	Anti-inflammatory drugs. Antagonists of histamine. Immunosuppressant drugs	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-20	Final test “Pharmacological regulation of metabolism, inflammation and immunity	Control of practical skills in writing prescriptions and providing rational choice of drugs affecting metabolism, inflammation and immunity	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-21	Drugs used to treat congestive heart failure. Cardiac glycosides. Antiarrhythmic drugs	Classification . Mechanism of action. Pharmacological effects. Clinical use. Adverse effects. Symptoms of cardiac glycosides toxicity and its	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B..

		treatment		
П-22	Antianginal drugs. Lipid-lowering drugs	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-23	Antihypertensive drugs	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-24	Diuretics. Drugs affecting the uterus.	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B..
П-25	Drugs affecting hemopoietic system. Drugs affecting thrombus formation and fibrinolysis	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-26	Drugs affecting the gastrointestinal tract.	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B..
П-27	Drugs affecting the respiratory system.	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-28	Final test “Pharmacological regulation of major organs and systems function”	Control of practical skills in writing prescriptions and providing rational choice of drugs affecting major organs and systems function	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-29	Basic principles of chemotherapy. Drugs affecting folate metabolism. Fluoroquinolones	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-30	Antibiotics – cell wall synthesis inhibitors.	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-31	Antibiotics – protein synthesis inhibitors	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-32	Antimycobacterial drugs. Antifungal drugs	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-33	Antiprotozoal drugs. Anthelminthic drugs	Classification. Mechanism of action. Pharmacological effects. Comparative analysis	Зн-1-7 Ум- 1-7 К-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof.

		of drugs. Clinical use. Adverse effects.	АВ-1-7	Poshyvak O.B.
П-34	Antiviral drugs. Anticancer drugs Противірусні засоби. Протипухлинні засоби.	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
П-35	Drug poisoning. General principles of treatment	Managemnt of acute drug poisoning. Symptoms of the most common drug poisoning. Antidotes, their mechanisms of action and clinical use.	Зн-5-6 Ум- 5-6 К-5-6 АВ-5-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-1	Basic and clinical evaluation of new drugs.	Main achievements of modern pharmacology	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-2	Drug metabolism in the liver. Inhibitors and inducers of cytochrome P-450 and their role in clinical practice.	The main phases of drug metabolism in the liver. Inducers and inhibitors of cytochrome P-450 and their role in drug-drug interactions.	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-3	Drug interactions	Types of drug interactions. Synergism of drugs. Antagonism of drugs. Incompatibility of drugs	Зн-6 Ум-6 К-6 АВ-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-4	Adverse effects of drugs.	The main types of adverse effects of drugs. Prevention of adverse drugs effects development. Possible consequences of repeated administration of drugs.	Зн-4 Ум-4 К-4 АВ-4	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-5	Basic principles of pharmacogenetics	The role of genetic polymorphism and its influence on the pharmacokinetics and pharmacodynamics of drugs	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-6	Mechanisms of synaptic transmission. Receptors as targets for drugs action	Neurotransmitters and their modes of actions. Receptors: proeprties, functions, classification. Classification of drugs acting on receptors	Зн-2 Ум-2 К-2 АВ-2	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-7	Pharmacology and toxicology of tobacco smoking. Toxicity of organophosphates. Drugs used in organophosphate poisoning	Toxic effects of nicotine. Modern drugs used to treat nicotine dependence. Toxic effetcts of organophosphates. The main symptoms of organophosphate poisoning and its treatment.	Зн-4-6 Ум-4-6 К-4-6 АВ-4-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-8	Role of adrenergic agonists in the treatment of shock and bronchial asthma.	Ation of adrenomimetics on the cardiovascular system and bronchi. Clinical use of alpha, beta- and alpha-adrennommetics in different types of shock.. Role of beta2-adrenomimetics in the treatment of bronchial asthma	Зн-3 Ум-3 К-3 АВ-3	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
СРС-9	β_1–selective adrenoblockers. β-adrenoblockers with intrinsic	Comparative analysis of beta-adrenoblockers. Advantages of beta1-selective adrenoblockers over non-selective agents.	Зн-1-6 Ум- 1-6 К-1-6 АВ-1-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

	sympathomimetic activity. β-adrenoblockers with vasodilating action.	Advantages of adrenoblockers with intrinsic sympathomimetc activity. Beta-adrenoblockers with vasodilating activity		
CPC-10	General anesthetics. Balanced anesthesia. Premedication.	Pharmacology of inhaled and intravenous anesthetics, their advantages and disadvantages. Agents used for balanced anesthesia. Drugs for premedication	Зн-1-5 Ум- 1-5 К-1-5 АВ-1-5	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-11	Drug dependence and drug abuse.	Mechanism of drug dependence. Dependence from opioid analgsics, its manifestations.. Agents used to treat drug dependence, their mode of acion. Drug abuse as a social and biological problem	Зн-4 Ум-4 К-4 АВ-4	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-12	Pharmacology of drugs used to treat migraine.	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-13	Pharmacology of antidepressants and lithium salts.	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-14	Pharmacology of psychomotor stimulants and analeptics	Classification Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-15	Nootrops. Adaptogens	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-16	Retinoids and their clinical use	Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-17	Microelements, their biological role and clinical use	Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-18	Anabolic steroids. Hormonal contraceptives	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-19	Hypothalamic hormones (agonists and antagonists). Pituitary hormones (agonists and antagonists)	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-20	Drugs affecting bone metabolism	Classification. Mechanism of action. Pharmacological effects. Comparative analysis	Зн-1-7 Ум- 1-7 К-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof.

		of drugs. Clinical use. Adverse effects.	АВ-1-7	Poshyvak O.B.
CPC-21	Salts of alkali and alkaline earth metals	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-22	Drugs affecting immune system	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-23	Drugs used in gout.	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-24	Pharmacology of antioxidants	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use..	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-25	Hypertensive agents	Classification . Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-26	Non-glycoside cardiotonic drugs	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-27	Drugs for treating disturbances of body fluid volume and osmolarity	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-28	Enzymes and their inhibitors	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-29	Hepatoprotective drugs. Drugs affecting bile formation. Drugs used for gallstones	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-30	Antidiarrheal drugs. Drugs improving the balance of intestinal microflora	Classification Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-31	Basic principles of antimicrobial therapy and prophylaxis	The main principles of cninical use of chemotherapeutic agents for the treatment of infections	Зн-3 Ум-3 К-3 АВ-3	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-32	Resistance to antibiotics: biochemical mechanisms, transfer.	The main mechanisms of development of resistance of pathogens to chemotherapeutic agents. The main ways to	Зн-3-4 Ум-3-4 К-3-4 АВ-3-4	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

		prevent resistance to antibiotics		
CPC-33	Antimicrobial drug combinations.Механізми розвитку резистентності мікроорганізмів до хіміотерапевтичних засобів	Goals of clinical use of combinations of antimicrobial agents. The main approaches to the choice of drugs for combined chemotherapy	Зн-6 Ум-6 К-6 АВ-6	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-34	Principles of antimalarial chemotherapy and chemoprophylaxis. Drugs used to treat toxoplasmosis, chlamydiasis, leishmaniasis	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.
CPC-35	Radioprotective agents	Classification. Mechanism of action. Pharmacological effects. Comparative analysis of drugs. Clinical use. Adverse effects.	Зн-1-7 Ум- 1-7 К-1-7 АВ-1-7	Ass. Prof. Havrylyuk I.M. Ass. Prof. Poshyvak O.B.

Lecture course highlights the problematic issues of pharmacology: history of pharmacology, the main achievements of pharmacology, relationship between chemical structure and pharmacological effects, pharmacokinetic and pharmacodynamic characteristics of drugs, clinical use of drugs, their adverse effects, drugs overdose (symptoms and treatment).
Methods of educational and cognitive activity: explanatory-illustrative method, problem-based method. This is done using multimedia presentations.
Methods of teaching in practical classes: verbal; visual; practical, explanatory-illustrative method, methods of stimulation and motivation of educational and cognitive activity, interactive methods: "Brainstorming", "Method of competitive groups", "Case method".
Practical classes include:
1. Identification by students pharmacological group of medicines according to modern classifications.
2. Students' interpretation of pharmacokinetic parameters of drugs
3. Students' interpretation of pharmacodynamic characteristics of drugs, explanation and interpretation of mechanisms of their action taking into account modern pharmacological, biochemical, histological knowledge.
4. Determination of the main pharmacological effects of drugs based on their mechanisms of action. Identification of the main side effects and ways and methods of their prevention and elimination.
5. Establishment by students of the main indications for clinical use of medicines. Justification of the rational choice of the drug, dose, route of administration depending on the pathology, age, condition of the patient.
6. Establishment of symptoms of drug overdose and development of an algorithm for emergency care in case of poisoning.
7. Determining the mechanisms of interaction of drugs and its consequences
8. Formation of practical skills of students to prescribe drugs in various dosage forms.
8. Preparation for the license exam "Step-1".
7. Solving situational problems of clinical direction, based on knowledge and ability to interpret the basic physicochemical properties of drugs, mechanisms of action of drugs, pharmacological effects and symptoms of overdose.

Self-study work of students involves the study of educational and methodical literature, illustrative material (tabular and video fund of the department), Internet resources.
It includes filling out workbooks; preparation for the license exam "Step-1"; solving situational problems.
Teaching methods: visual; practical, explanatory-illustrative method, methods of stimulation and motivation of educational and cognitive activity.

8. Verification of learning outcomes

Ongoing control is carried out at each practical 1esson depending on specific aims of each topic. It includes tests, structured written works, control of practical skills in conditions close to real professional activity.
For students knowledge assessment the following diagnostic tools are used: tests, solving pharmacotherapeutic problems, prescribing drugs, identifying drugs according to international classifications, analyzing organisms functions changes induced by drugs.

Ongoing activity of students is assessed according to traditional 4 scores scale. All types of work envisaged in the programme are taken into accout. The student has to be assessed for each topic. Forms of assessment include control of theoretical and practical aspects of professional skill training.
Maximal number of scores which the student may get for ongoing learning activity accounts for 120 scores.
Minimal number of scores which the student has to get for ongoing learning activity accounts for 72 scores.
Number of scores is calculated in the following equation:

$$x = \frac{CA \times 120}{5}$$

CA – average for marks according to the traditional scale (rounding to the second figure after the point)

Control of self-study work
Control of self-study work is undertaken during corresponding practical. For topics which are not included into classroom lessons control is carried out during exam..

Code of learning outcome	Code of the class	Way of verification of learning outcomes	Assessment criteria
Зн-1-7 Ум- 1-7 К-1-6 АВ-1-7	П - 1- 35, СРС – 1- 35	For the ongoing control of students' knowledge, test tasks on the topic of the lesson are used (including tests with several correct answers), theoretical questions, which include questions from the lecture course and questions from self-study work; clinical cases (with 3 questions); tasks to control practical skills in writing prescriptions according to the topic of the lesson. **Evaluation of test tasks:** **Excellent ("5")** - The student answers 90-100% of the tests correctly. **Good ("4")** - The student answered 71-89% of the tests correctly. **Satisfactory ("3")** - The student answered 60-70% of the tests correctly. **Unsatisfactory ("2")** - The student answered less than 60% of the tests. **Assessment of practical skills:** **"5"** - the prescrition is written correctly, the answer is complete; **"4"** - the prescrition is written with 2-3 minor errors; **"3"** - the prescrition is written with 1 significant, gross error or more than 3 minor errors. **"2"** - the prescrition is written completely incorrectly or with 2 or more gross errors. **Evaluation of the theoretical question**:	**Excellent ("5") –** The student answers correctly 90-100% of format A tests. Provides correct, explicit, logical answers to standardized questions of ongoing topic, including material of lecture and self-study work. Demostrates pharmacology professional skills-building and competencies required for medical practice. Solves problems of increased complexity, is able to generalize information. **Good ("4")** - The student answers correctly 70-89% of format A tests. Provides correct, explicit, logical answers to standardized questions of ongoing topic, including material of lecture and self-study work. Uses theoretical knowledge in practical problem solving. Is able to solve problems of low to medium complexity. Demostrates professional skills-building and competencies grater than minimum

		"5" - the answer is correct, complete **"4"** - the answer is correct, incomplete **"3"** - the answer with errors, incomplete **"2"** - the answer is not essential, illogical **Evaluation of the clinical case**: **"5"** - correct, complete answers to all questions **"4"** - correct, complete answers to two questions **"3"** - the correct, complete answer to one question **"2"** - answers to all questions are incorrect or missing.	necessary. **Satisfactory ("3") -** The student answers correctly 50-69% of format A tests. Incompletely, by means of additional questions answers to standardized questions of ongoing topic, including material of lecture and self-study work. Is not able to formulate explicit, logical response on his own. While answering and demonstrating professional skills-building and competencies makes mistakes. The student solves the easiest problems, acquires the minimum necessary knowledge and skills. **Unsatisfactory ("2") -** The student answers correctly less than 50% of format A tests. Does not know material of ongoing topic. Is not able to formulate explicit, logical response on his own, does not answer additional questions, does not understand the material content. While answering and demonstrating professional skills-building and competencies makes serious mistakes.

Final control		
General assessment system	Participation in the work during the semester / exam - 60% / 40% on a 200-score scale	
Assessment scales	traditional 4-score scale, multi-score (200-score) scale, ECTS rating scale	
Conditions of admission to the final control	The student attended all practical classes and received at least 120 scores for ongoing activity	
Type of final control	Methods of final control	Credit criteria
Credit	All topics submitted for ongoing control must be included. Grades from the 4-score scale are converted into score on a multi-score (200-score) scale in accordance with the Regulation "Criteria, rules and procedures for evaluating the results of student learning activities"	*The maximum number of scores is 200.* *The minimum number of scores is 120*

Exam assesment criteria

Students who have completed all types of work provided for in the curriculum, completed all classes and scored at least the minimum number of points while studying the discipline are admitted to the exam**.**

Exam	*The procedure and methods of final control / all its stages* The exam consists of the following stages: **The first stage** is a written answer to test tasks of A format (blank or computer test control). The student answers the test package. Each package contains 50 A-format tests on the topics of each section. **Stage II** - written answer to 5 clinical cases. The student receives 5 clinical cases, which must be answered in writing. **Stage III** - testing of practical skills (5 prescriptions).	*Asswsment criteria for each specific stage of final control* The correct answer to each of the 50 test tasks of format A is estimated at 1 score. Total number - 50 scores. Evaluation of each of the 5 clinical cases tasks is as follows: 3 scores - the correct complete answers to the questions of the problem. 2 scores - correct incomplete answers to questions. 1 score - the answers to the questions of the problem are incomplete, with errors. 0 scores - the answer is incorrect or missing. Evaluation of each of the 5 prescriptions is as follows: 3 scores - the prescription is written correctly, indicating the pharmacological group, mechanism of action, pharmacological effects, indications for use. 2 scores - the prescription is written with 2-3 minor errors; 1 score - the prescription is written with 1 significant, gross error or more than 3 minor errors. 0- scores - the prescription is written completely incorrectly or with 2 or more gross errors

The maximum number of scores that a student can score for the ongoing academic activity for admission to the exam is 120 scores.

The minimum number of scores that a student must score for the ongoing academic activity for admission to the exam (differentiated test) is 72 scores.

The calculation of the number of scores is based on the grades obtained by the student on a 4-score (national) scale during the study of the discipline, by calculating the arithmetic mean (CA), rounded ***to two decimal***

places.
The resulting value is converted into scores on a multi-score scale as follows:

$$x = \frac{CA \times 120}{5}$$

9. Course policy

The organization of the educational process is carried out on the basis of the credit-transfer system in accordance with the requirements of the Bologna process with the use of a rating system for assessing of student performance.
The MISA system is actively used in the educational process.
Unacceptable are: copying and plagiarism; absences and being late for the classes; use of a mobile phone, tablet or other mobile devices during the lesson (except for the cases provided by the curriculum and methodical recommendations of the teacher); untimely performance of the tasks set by the teacher during the current, final control of knowledge, as well as independent work of students.
Timely completion of the tasks set by the teacher in the system is mandatory.
Unacceptable: neglect of safety rules during lectures, practical classes, tests, consultations and exams.

10. Literature

Basic

1. Chekman I.S., Gorchakova N.O. Panchenko N.I., Bekh P.O. Pharmacology. – Vinnytsa: Nova Knyga Publishers, 2006. – 384 p.
2. Pharmacology: textbook; Second edition, updated / Bobyrov V.M., Devyatkina T.O., Vazhnicha O.M., Khristyuk V.M. - Vinnytsa: Nova Knyga Publishers, 2012. – 520 p.
3. Stefanov O., Kucher V. Pharmacology with General Prescription. – Kyiv, 2007.- 318 p.
4. Ganziy T.V. Study Guide to Basic Pharmacology. – Kharkiv: Fakt, 2005. – 264 p.
5. Katzung B.G. Basic and Clinical Pharmacology, 15th edition. – New-York: Lange, 2021. – 1202 p
6. Laurence D.R., Bennet P.N., Brown M.G. Clinical Pharmacology, 11th edition. – London: Churchill-Livingstone Elsevier, 2014. – 622 p.
7. Rang H.P., Dale M.M., Ritter J.M., Moore P.K. Rang's and Dale's Pharmacology, 9th edition. – London: Churchill-Livingstone Elsevier, 2019. – 761 p.
8. Tripathi K.D. Medical Pharmacology, 8th edition. – New Dehli: Jaypee Brothers Medical Publishers (P) Ltd, 2021. – 1080 p.

Additional

1. Lippincott's Illustrated Reviews: Pharmacology, 8th edition /Ed.: R. Finkel, M.A.Clark, L.X.Cubeddu. – Lippincott Williams Wilkins, 2014. – 560 p.
2. Lullman H., Albrcht Z., Klaus M., Detlef B. Color Atlas of Pharmacology. – Stuttgart – New-York: Thieme, 2000. – 386 p.
3. Kaplan medical. USMLE Step 1. Lecture notes. Pharmacology /L.R.Raymon. - Kaplan medical, 2021. – 496 p.
4. PharCards. Review cards for medical students, 5th edition / E.C.Johannsen, M.C. Sabatine. – Lippincott Williams Wilkins, 2019. – 703 p.
9. Netter's illustrated pharmacology. Updated edition– London: Churchill-Livingstone Elsevier, 2014. – 442 p.

Methodical literature

1. Havrylyuk I.M. Pharmacology workbook (Part 1), Lviv 2021
2. Havrylyuk I.M. Pharmacology workbook (Part 2), Lviv 2021
3. Pharmacology Work educational programme
4. Additional materials for lectures and practical classes on MISA

11. Course equipment and meterials

Textbooks, methodical literature drug collection, computers

12. Additional information

Lectures and practical classes are held at: 52 Pekarska Street, Lviv
Responsible for the educational process – Associate professor Ivankiv O.L., Oksanalvivna@gmail.com
Responsible for the scientific process – Aeniot lecturer Dyachok I.L., irynalvivnadyachok@gmail.com
Responsible for the students scientific circle – Associate professor Poshyvak O.B., olesya.poshyvak@gmail.com

Syllabus compliers	Associate Professor Havrylyuk I.M. MD, PhD Professor Pinyazhko O.R MD, PhD, DSc
Head of Pharmaclogy Department	Professor Pinyazhko O.R MD, PhD, DSc