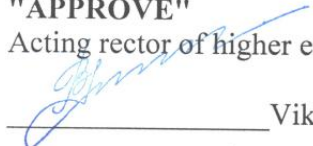


National Pirogov Memorial Medical University, Vinnytsya

"APPROVE"

Acting rector of higher education institution

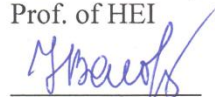


Viktoriia PETRUSHENKO

"31" August 2023

"AGREED"

Head of the Department Pharmacology,
Prof. of HEI



Nataliia VOLOSHCHUK

"30" August 2023 year

**SYLLABUS
of academic discipline
«PHARMACOLOGY»**

Specialty	222 Medicine
Educational level	the second (master's) level
Educational programme	EPP Medicine, 2022
Academic year	2023-2024
Department	Pharmacology
Lecturer (if lectures are given)	Prof. Voloshchuk Nataliia I.
Contact information	Pharmacology Department, pharmacology@vnm.edu.ua, National Pirogov Memorial Medical University, Vinnytsya, Pirogov's st, 56, (0432)511400
Syllabus compiler	Ass.-prof. Denysiuk Olga M.

1. Status and structure of the discipline

Discipline status	Compulsory
Discipline code in EPP/ discipline place in EPP	CC 20, discipline of general training or professional training
Course / semester	3rd year (V-VI semesters)
The amount of discipline (the total number of hours / number of credits ECTS)	210 hours / 7 credits ECTS
Number of content modules	2 modules
The structure of the discipline	Lectures - 32 hours Practical classes 68 hours Independent work 110 hours In general: classroom classes - 47.6%, independent work outside the classroom - 52.4%
Number of modules	2
Language of study	English
Form of study	Full-time

2. Description of the discipline

Short annotation of the course, relevance. The main focus of the program is to acquire knowledge of the discipline of professional training "Pharmacology", the study of which is necessary for successful mastering of a number of clinical disciplines and professional activity. The subject area of the program is the study of changes in the human body under influence of drugs (pharmacodynamics), and the transformation of drugs in the human body from the moment of entry to the moment of excretion (pharmacokinetics). As a result of studying this discipline the student receives theoretical knowledge and practical skills and abilities sufficient to solve complex problems in the field of professional activity. The program includes modern educational material on pharmacodynamics and pharmacokinetics of medicines.

Prerequisites. For successful mastering of discipline, the student needs the knowledge received in the course of studying of Latin, ethics, ecology, medical biology, medical chemistry, biological and bioorganic chemistry, biophysics, human anatomy, physiology, pathological physiology, microbiology and integrates with these disciplines. Knowledge of these disciplines helps to understand the pharmacokinetic and pharmacodynamic of drugs.

The purpose of the course and its significance for professional activities. The purpose of the discipline is to form students' theoretical knowledge and practical skills of rational and safe for human health use of drugs for the treatment and prevention of diseases. This will allow to perform professional duties in the future - rational choice of drug, development of pharmacotherapy regimens, monitoring the effectiveness and safety of pharmacotherapy, prediction and prevention of adverse drug reactions.

Postrequisites. In the process of studying the discipline, a student acquires knowledge, which is necessary for successful mastering of professional training disciplines clinical pharmacology and other clinical disciplines and the application of acquired knowledge, skills and abilities in the process of further education and professional activities

3. Learning outcomes.

After successful study of the discipline the applicant will be able to:

1. Have specialized knowledge in pharmacology, acquired in the learning process, and will be able to apply them in practice.
2. To determine the group affiliation of drugs according to modern classifications and give pharmacological characteristics to drugs (group affiliation, mechanism of action, pharmacological effects (main, side), indications and contraindications for use).

3. Choose drugs for medical treatment of the disease. To determine the frequency of taking the drug, its daily, course dose in patients of different ages in accordance with concomitant diseases and the use of other drugs (depending on the characteristics of the pharmacokinetics of drugs). It is substantiated to choose an adequate dosage form according to the diagnosis and condition of the patient, the route of administration.
4. To determine the manifestations of possible adverse reactions of drugs, symptoms of overdose with potent and poisonous drugs, methods of their prevention and principles of treatment.
5. To prognoses the consequences of the interaction of drugs in their combined administration, drugs and food components, drugs and alcohol.
6. To diagnose an emergency condition and to choose drugs for emergency medical care, as well as in case of acute poisoning with drugs and some toxic substances with the use of antidotes in each case.
7. Maintain medical documents: prescribe and analyze prescriptions for medicines in various dosage forms
8. To analyze pharmacological information in modern reference books, scientific and professional periodicals, including English-language ones and make informed decisions.

4. Content and logistic of the discipline

MODULE 1 Medicinal prescription. General pharmacology. Pharmacology of drugs influencing the nervous system. Chemotherapeutic drugs	V semester 74 hours / 2.5 credits	Lectures № 1-5, 16 Practical classes №№ 1-14 Topics for self- study №№ 1-6
MODULE 2 Pharmacology of drugs influencing the function of effector organs and systems and tissue metabolism. Principles of treatment of acute poisoning	VI semester 136 hours / 4.5 credits	Lectures № 6-15 Practical classes №№ 15-34 Topics for self- study №№ 7-20

The course includes 32 topics, which are divided into 2 thematic modules.

MODULE 1

Medicinal prescription. General pharmacology. Pharmacology of drugs influencing the nervous system.

- Topic 1. History of pharmacology. General pharmacology. Pharmacokinetics. Pharmacodynamics. Biotransformation, drug interaction.
- Topic 2. Introduction to the medical prescription. Solid medicinal forms. Soft medicinal forms. Non-dosage forms
- Topic 3. Liquid medicinal forms. Solutions for internal and external use. Injectable drugs. Aerosols. Infusions and decoctions, tinctures, extracts, suspensions, potions
- Topic 4. Drugs acting on the transfer of excitation in the cholinergic synapses. Cholinomimetics. Anticholinesterase drugs. Cholinesterase reactivators. Toxicology of nicotine and ways to combat smoking.
- Topic 5. Drugs acting on the transfer of excitation in the cholinergic synapses. Cholinoblockers
- Topic 6. Drugs acting on the transmission of excitation in adrenergic synapses. Adrenomimetic drugs. Sympathomimetics
- Topic 7. Drugs acting the transmission of excitation in adrenergic synapses. Adrenoblockers. Sympatholytics. Dopaminergic, serotonergic and GABAergic drugs.
- Topic 8. Local anesthetics, astringents, covering, adsorbing and irritant drugs

- Topic 9. General anesthetics. Pharmacology of ethyl alcohol. Modern approaches to drug treatment of alcoholism. Hypnotics. Antiepileptics. Drugs for treatment Parkinson's disease. Drugs for Alzheimer's disease.
- Topic 10. Neuroleptics, tranquilizers, sedatives
- Topic 11. Pharmacology of narcotic and non-narcotic analgesics. Drugs of abuse. Drug dependence and its social importance
- Topic 12. Pharmacology of nonsteroidal anti-inflammatory drugs
- Topic 13. Psychostimulants. Analeptics. Antidepressants. Drugs for the treatment of mania. Pharmacology and toxicology of lithium salts. Adaptogens.
- Topic 14. Nootropic drugs. Drugs which relieve insufficiency of cerebral circulation. Neurotransmitters in the central nervous system

MODULE 2

Pharmacology of drugs influencing the function of effector organs and systems and tissue metabolism. Chemotherapeutic drugs. Principles of treatment of acute poisoning

- Topic 1. Drugs used for treatment of ischemic heart disease. Antianginal agents
Antiatherosclerotic agents. Angioprotectors
- Topic 2. Antihypertensive and hypertensive agents
- Topic 3. Cardiotonic drugs. Cardiac glycosides and other cardiotonic drugs. Antiarrhythmic agents
- Topic 4. Diuretic agents. Drugs used in gout. Drugs which influence on the myometrium.
Prostaglandins, their usage in medicine
- Topic 5. Drugs affecting functions of the respiratory organs
- Topic 6. Drugs acting on the gastric secretion function
- Topic 7. Drugs acting on the gastric intestine motility function. Drugs for the treatment and prevention of dysbiosis. Prebiotics. Probiotics
- Topic 8. Antiseptics and disinfectants
- Topic 9. Fluoroquinolone derivatives. Sulfonamides. Nitrofurans, oxichinolone derivatives.
- Topic 10. Antibiotics: β -lactams, macrolides, azalides, thienamides, carbapenems, aminoglycosides
- Topic 11. Antibiotics: chloramphenicol, tetracyclines, lincosamides, rifampin, polyenes.
Antiviral drugs. Antifungal agents
- Topic 12. Anthelmintics. Antimalarial. Antiprotozoal. Drugs for the treatment of tuberculosis.
Antineoplastic drugs. Radioprotectors
- Topic 13. Drugs of pituitary, thyroid, parathyroid and pancreatic hormones. Synthetic antidiabetic drugs.
- Topic 14. Glucocorticoids, mineralocorticoids, gonadal hormones' drugs. Anabolic steroids.
Drugs for the treatment and prevention of osteoporosis. Drugs for hormonal contraception
- Topic 15. Drugs affecting on the blood clotting. Phlebotropic drugs. Drugs affecting on the hemopoiesis.
- Topic 16. Antiallergic and immunotropic drugs
- Topic 17. Drugs with vitamin activity. Retinoids, pharmacological properties. Indications for use. Pharmacology of enzyme drugs, enzyme inhibitors and amino acids
- Topic 18. Principles of treatment of acute poisoning. Pharmacology of antidote drugs. Drugs for parenteral nutrition. Plasma substitutes. Metal compounds in pharmacology

Types of education according to the curriculum are: a) lectures, b) practical classes, c) independent work of students, d) consultations

Lectures on pharmacology cover the main and problematic issues of pharmacokinetics and pharmacodynamics of the main groups of drugs, taking into account modern advances in medicine.

Practical classes provide a theoretical justification of the main issues of the topic and the acquisition of the following practical skills:

- pharmacological characteristics of drugs using drugs "training pharmacy": individual (each drug separately), group (group characteristics in general), comparative characteristics of drugs within the group on the features of their pharmacokinetics and pharmacodynamics, comparative analysis of drugs from different pharmacological groups for the treatment of certain disease, which will allow to create an algorithm for the treatment of the patient, taking into account the peculiarities of the disease, comorbidity and general condition of the patient and standard treatment regimens;

- solving of pharmacotherapeutic, typical and atypical clinically-oriented situational problems according to knowledge of pharmacokinetics and pharmacodynamics of drugs;

- prescribing medicines in various dosage forms.

In practical classes, students solve tests, pharmacotherapeutic and situational problems of varying complexity, tasks from the base of KROK-1, work with drugs "training pharmacy", prescribe drugs in various dosage forms.

The student's independent work involves preparation for practical classes and development of practical skills, study of topics for independent extracurricular work, preparation of presentations, tables, processing of scientific literature and writing reviews of the provided topics for individual work. Control of mastering the topics of independent extracurricular work is carried out at intermediate control classes and final control of the discipline.

Thematic plans of lectures, calendar plans of practical classes, thematic plan of independent extracurricular work, volume and directions of individual work are published on the website of the department.

The route for obtaining materials: Pharmacology department / for students / Full-time education / Medicine / 3 course / Educational materials / or through the link [https://www.vnmue.edu.ua/pharmacology department #](https://www.vnmue.edu.ua/pharmacology%20department%20#). Access to the materials is carried out through the student's corporate account s000XXX@vnmue.edu.ua.

5. Forms and methods of monitoring academic performance

Current control in practical studies	Methods: oral or written survey, testing, solving pharmacotherapeutic and situational problems, solving problems from the KROK-1 database, working with drugs of the "training" pharmacy, prescribing
Control of mastering the thematic section of the discipline at intermediate control lessons	Methods: oral or written survey, computer testing (KROK-1 database), solving pharmacotherapeutic, control of practical skills
Final semester control (credit) at the end of the V semester (If provided by the curriculum)	According to the Regulation of the Academic process in VNMU named after M.I. Pirogov (link https://www.vnmue.edu.ua/General information)
Final control of the discipline - exam	Methods: pre-examination testing, oral questioning (according to the Regulation of the Academic process in VNMU named after M.I. Pirogov (link https://www.vnmue.edu.ua/General information))
Learning success diagnostic tools	Theoretical questions, tests, pharmacotherapeutic and clinically-oriented situational problems, practical skills demonstration

6. Assessment criteria

Knowledge assessment is carried out in accordance with the Regulations of the Academic process in VNMU named after M.I. Pirogov (link link [https://www.vnmue.edu.ua/General information](https://www.vnmue.edu.ua/General%20information))

Continuous assessment	On a four point system of traditional assessments: 5 «excellent», 4 «good», 3 «satisfactory», 2 «unsatisfactory»
Midpoint separation assessment	On a four-point system of traditional assessments
Control of practical skills	According to the four-point system of traditional assessments
Pass-fail exam	On a 200-point scale (the arithmetic average grade for the semester is converted into points) Credited: 122 to 200 points Not credited: less than 122 points
Final control of the discipline	Sum of points for pre-examination testing (12-20 points) and oral questioning (38-60 points) Exam grade: 71-80 points - "excellent" 61-70 points - "good" 50-60 points - "satisfactory" Less than 50 points - "unsatisfactory" / did not pass
Discipline assessments:	Current academic assessment - from 72 to 120 points (conversion of the average traditional assessment of practical class on a 120-point scale): 60% of the grade for the discipline Final control - from 50 to 80 points: 40% of the grade for the discipline Individual work - from 1 to 12 points From 122 to 200 points in total.

Discipline Score Scale: National and ECTS

The sum of grades for all types of educational activities	Score ECTS	Score on a national scale	
		For exam, course project (work), practice	for credit test
180-200	A	excellent	credited
170-179,9	B	good	
160-169,9	C		
141-159,9	D	satisfactory	
122-140,99	E	satisfactory	
61-121,99	FX	unsatisfactory with the possibility of reassembly	is not credited with the possibility of reassembling
1-60	F	unsatisfactory with a mandatory reexamination of discipline	is not credited with mandatory reexamination of discipline

Criteria for student knowledge assessment

Assessment of oral / written response during the current control

The grade "*excellent*" is given to the student who correctly answers all questions, deeply knows the program material, as well as additional information on the topic; consistently, specifically, logically and comprehensively tells it. Connects the topic material with the material of the previously studied sections. Knows the classification of drugs, correctly names all drugs,

explains their mechanism of action, indications and contraindications for use, side effects and ways to prevent and eliminate them. Correctly provides a comparative description of drugs.

A grade of "*good*" is given to a student who correctly answers most of the questions, demonstrates sufficiently meaningful knowledge of the material, correctly and essentially answers standard questions on the topic, knows the drugs, explains their action, indications and contraindications, gives a comparative description of drugs, at the same time can allow insignificant errors and inaccuracies in answers.

Assessment of "*satisfactory*" is given to the student knows the basic material (groups of drugs, individual representatives of each group and the main indications for their use), but has not mastered its details, does not fully answer standard questions, does not name all drugs, mistakes in their interpretation action and purpose, compares drugs only on individual indicators.

The grade "*unsatisfactory*" is given to a student who does not know most of the program material, cannot name drugs from specific groups of drugs, is not guided by the indications and side effects of drugs.

Assessment of practical skills (including in solving pharmacotherapeutic problems)

A grade of "*excellent*" is given to a student who correctly determines the drug and dosage form in which it should be prescribed, follows the rules of prescribing, including drugs from lists A and B (narcotic, potent, psychotropic drugs), without errors indicates the names of active substances in Latin, correctly indicates the dose, clearly chooses the method and frequency of its use in the signature. Clearly indicates his group and impressions.

A grade of "*good*" is given to a student who correctly prescribes drugs in the form of prescriptions, follows the rules of prescribing trunk prescriptions, all parts are present in the prescription, and may make minor mistakes in spelling Latin names, not fully described ways to use the drug in the signature. Correctly names his group and main impressions.

The grade "*satisfactory*" is given to the student who writes prescriptions, but significant errors in the structure of the prescription are assumed: incorrectly indicates the dose of the drug, does not fully indicate the method of its use in a particular case. Mistakes in group definition, names only some impressions

Grade "*unsatisfactory*" is given to a student who cannot give the correct answer to the question, makes gross errors in the structure of the prescription, the dosage of the drug, incorrectly chooses how to use it in a particular case. Does not name the group of the drug and indications for its use.

Evaluation of testing during written and computer control

The grade "*excellent*" is given to the student who at the decision of test tasks admits no more than 10% of incorrect answers (volume of correct answers 90-100%)

A grade of "*good*" is given to a student who allows no more than 20% of incorrect answers when solving test tasks (the volume of correct answers is 80-89%)

The grade "*satisfactory*" is given to the student who at the decision of test problems admits no more than 30% of incorrect answers (volume of correct answers) (70-89%).

The grade "*unsatisfactory*" is given to the student who solves correctly 69% and less of test tasks.

Assessment in the poetry of situational tasks

The grade "*excellent*" is given to a student who freely and correctly solves standard and non-standard situational problems: correctly identifies the problem and presents ways to solve it, correctly justifies his answer, can suggest several ways to solve the problem.

The grade "*good*" is given to the student who correctly solves typical situational problems, thus insignificant mistakes and inaccuracies can be assumed: the problem is revealed, but not completely opened, insignificant mistakes in ways of its decision are possible; the student substantiates his answer but not in full.

A grade of "*satisfactory*" is given to a student who generally solves the problem, but makes several more significant mistakes in solving pharmacotherapeutic problems: the problem is identified and partially solved, there are difficulties in justifying the decision.

The grade "*unsatisfactory*" is given to the student who does not understand the essence of the specified problem, cannot give the correct answer to the task.

Criteria for final assessment of knowledge (exam)

The grade "excellent" is given to the student competently and in a logical sequence provides answers to the questions of the exam ticket. During the answer demonstrates the ability to analyze theoretical material, makes thorough conclusions about the importance of theoretical material for practical medicine, provides clear correct answers to additional non-standard questions, correctly uses pharmacological terminology, answered independently without prompting and additional questions, but one or two inaccuracies in covering secondary issues easily corrects according to the examiner's remark.

The grade "good" is given to a student who has a good knowledge of theoretical material and in a logical sequence provides answers to the questions of the examination ticket, knows the groups of drugs and drugs for each group, explains the mechanism of action, indications and contraindications for use, but admits minor inaccuracies, which are quickly corrected when answering clarifying questions of the examiner.

A grade of "satisfactory" is given to a student who demonstrates knowledge of basic concepts and definitions when answering an exam ticket, demonstrates knowledge of the basic principles of the discipline (groups of drugs, some representatives of each group and the main indications for their use), but does not name all drugs, errors in interpretation of their action and purpose, which only partially corrects after leading and additional questions of the examiner.

The grade "*unsatisfactory*" is given to a student who does not know the answer to one of the questions of the exam ticket, makes serious mistakes when answering questions, can not explain the basic concepts and definitions, does not know pharmacological groups, drugs and indications, does not know the answers to additional clarifying questions of the examiner.

The calculation of individual points is carried out on the basis of the Regulation of the Academic process in VNMU named after M.I. Pirogov (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information)).

- prizes in the second round of the All-Ukrainian Olympiad in Pharmacology, interuniversity and international conferences - 12 points
- prizes in the first round of the All-Ukrainian Olympiad in Pharmacology and intra-university conferences - 11-10 points
- participation without a prize in the second round of the All-Ukrainian Olympiad in Pharmacology, interuniversity and international conferences - 10 points
- participation without a prize in the first round of the All-Ukrainian Olympiad in Pharmacology, and intra-university conferences - 6-8 points
- creation of additional visual materials for the department - 6 points.

7. Policy of discipline / course

The student has the right to receive high-quality educational services, access to contemporary scientific and educational information, qualified advisory assistance during the study of discipline and mastering practical skills. The policy of the department during the providing of educational services is a student-centered, based on normative documents of the Ministry of Education and the Ministry of Health of Ukraine, the Statute of the University and the Procedure for the Providing of Educational Services regulated by the main principles of the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsya and the principles of academic integrity (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information)).

Adherence to the rules of VNMU, safety techniques in practical classes.

At the first practical lesson he instructs on safe behavior in the department.

Requirements for preparation for practical classes.

The student is obliged to take an active part in the educational process: to attend classes and be prepared for them, prescriptions and pharmacotherapeutic tasks must be written in the workbook; actively discuss the topic of the lesson, perform all the tasks provided by the program, look for additional information on the topic of the lesson and present it to their colleagues.

The student must come to class on time. A student who is more than 10 minutes late for class is not allowed to the last and must work it in the prescribed manner.

In practical classes, the student must be dressed in a medical gown, otherwise students are not allowed to study.

The student must follow the safety rules while staying in the department.

In its work, the staff of the department adheres to the principles of mutual respect and tolerance. The same is required of students.

Usage of mobile phones and other electronic devices.

The use of mobile phones and other electronic devices in the classroom is not allowed (except in cases of demonstration of additional material of the topic).

Academic integrity. When studying the discipline, the student must be guided by the Code of Academic Integrity and Corporate Ethics of National Pirogov Memorial Medical University, Vinnytsya (link : [https://www.vnmu.edu.ua/General information/](https://www.vnmu.edu.ua/General%20information/) Code of Academic Integrity). In case of violation of the norms of academic integrity during the current and final controls student receives a grade of "2" and must work it out to his teacher in the prescribed manner within two weeks after receiving an unsatisfactory assessment).

Missed classes. Missed classes are working out in the manner prescribed by Regulations of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information/)) at the time of workout schedule (published on the website of the department [https://www.vnmu.edu.ua/ department pharmacology#](https://www.vnmu.edu.ua/departament%20farmakologiyi/)) to the duty teacher or his/her teacher. To rework the missed lesson, the student must provide a workbook with written prescriptions and solved pharmacotherapeutic problems on the relevant topic, complete a written task and orally answer questions on the topic of the lesson.

The procedure for admission to the discipline final control is given in the Regulations of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information/)). To the final control allowed students who do not have missed practical classes and lectures and received an average traditional grade of at least "3".

Additional points. Individual points in the discipline that student can receive for individual work, is determined by the results of his individual work according to Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information/)).

Conflict resolution. In case of misunderstandings and complaints to the teacher because of the quality of educational services, knowledge assessment and other conflict situations, student should submit his / her claims to the teacher. If the issue is not resolved, the student has the right to apply to the head of the department according to Complaints Consideration Procedure in National Pirogov Memorial Medical University, Vinnytsya (link [https://www.vnmu.edu.ua/General information](https://www.vnmu.edu.ua/General%20information/))

Politics in terms of remote learning. Distance learning regulated by the Regulations of the elements of remote learning in National Pirogov Memorial Medical University, Vinnytsya ([https://www.vnmu.edu.ua/ General information](https://www.vnmu.edu.ua/General%20information/)). The main training platforms for studying are Microsoft Team and Google Meets. Practical classes and lectures, exercises and consultations

during distance learning is published on the website of the department ([https://www.vnmu.edu.ua /Department of Pharmacology/to Students](https://www.vnmu.edu.ua/Department%20of%20Pharmacology/to%20Students)).

Feedback from teachers is via messengers (Viber, Telegram, WhatsApp) or e-mail (at the teacher's choice) during working hours.

8. Educational resources.

Educational and methodological support of the discipline is published on the website of the department (<https://www.vnmu.edu.ua/> department of Pharmacology / for students). Consultations are held twice a week according to the schedule.

Main references

1. Bobyrov V. Pharmacology : textbook / V. Bobyrov, T. Devyatkina, O. Vazhnicha, V. Khristyuk. –Vinnitsya : Nova Knyha, 2015. – 520 p.
2. Pharmacology / I. B. Samura, I. F. Belenichev, A. V. Nerush ; Zaporizhzhia State Medical University. – Vinnytsia : Nova Knyha, 2020. – 632 p.

Additional references

1. Basic & Clinical Pharmacology / Bertram G. Katzung, Susan B. Masters, Anthony J. Trevor. – McGraw Hill Lange – McGraw-Hill, 2020. - P. 1328.
2. Rang and Dale's Pharmacology. 9th edition. – Elsevier LTD (Edinburg, London, New York, Oxford, Philadelphia, St Louis, Sydney), 2020. – 761 p.
3. Lippincott's Illustrated Reviews: Pharmacology. 7th edition / Karen Whalen – Wolters Kluwer (Philadelphia, Baltimore, New York, London, Buenos Aires, Hong Kong, Sydney, Tokyo)/ – 2019. – 664p.
4. Color Atlas of Pharmacology / Heinz Luellman, Klais Mohr, Lutz Hein. - Thieme (Stuttgart, New York, Delhi, Rio de Janeiro), 2018. – 446 p.
5. Essentials Of Medical Pharmacology / K. D Tripathi. – Jaypee Brothers Medical Publishers (P) LTD, 2018. – 1080 p.
6. Godovan V.V. Pharmacology in pictures and schemes. – Odessa : The Odessa National Medical University, 2021. – 464 p.
7. Pharmacology - Cito! : Textbook / Edited by S.M. Drogovoz. - Kharkiv, 2016. - 192 p.
8. Pharmacology at your palms: reference book / Drogovoz S.M., Kutsenko T.A. - Kharkiv: NphaU, 2016. - 80 p.

Information resources

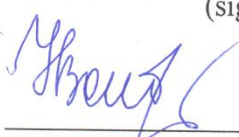
1. **Addresses department's website:** www.vnmu.edu.ua / Department / Department of Pharmacology / To students on which the calendar plans of practical classes and lectures, methodical recommendations for independent classroom and extracurricular work, lecture material, test tasks from the KROK-1 base in Ukrainian and English and materials for preparation for final classes and exam are specified.
2. Address of library: library.vsmu.edu.ua
3. FDA - <https://www.fda.gov>
4. Index to Drug-Specific Information - <https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/index-drug-specific-information>
5. Drugs.com <https://www.drugs.com/alpha/a.html>
6. Sites of professional publications, electronic international databases (for example PubMed - <http://www.ncbi.nlm.nih.gov>)

9. The timetable and distribution of groups with assigned teachers are published on the web page of the department (<https://www.vnmua.edu.ua> / department Pharmacology / for students).

10. Questions to final semester control (exam) of the discipline are published on the web page of the department (<https://www.vnmua.edu.ua> / department Pharmacology/ for students).

The syllabus of the discipline "Pharmacology" was discussed and approved at the meeting of the department pharmacology (record № 1, dated "30" August 2023)

Responsible for the academic discipline  Ass.-prof. of HEI Olga DENYSIUK
(signature)

Head of the department  Prof. of HEI Nataliia VOLOSHCHUK
(signature)