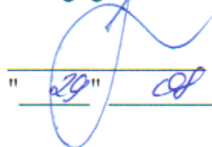


National Pirogov Memorial Medical University, Vinnytsya

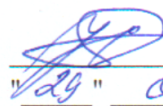
«APPROVE»

Higher Educational Institution
Vice-Rector for Scientific,
Pedagogical and Academic Affairs


" 29 " 20 25 Inna ANDRUSHKO

«AGREED»

Head of clinical pharmacy and
clinical pharmacology department


" 29 " 20 25 Sviatoslav SEMENENKO

**SYLLABUS
of academic discipline**

DRUG TOXICOLOGY

Specialty	226 "Pharmacy, industrial pharmacy"
Educational level	the second (master`s) level
Educational programme	EPP "Pharmacy", 2023
Academic year	2025-2026
Department	<i>Clinical pharmacy and clinical pharmacology</i>
Lecturer	Ass-prof. Inna Doroshkevych
Contact information	clinpharm@vnm.edu.ua , Pirogov str, 56
Syllabus compiler	Ass-prof. Inna Doroshkevych

1. Status and structure of the discipline

Discipline status	Optional
Discipline code in EPP/discipline place in EPP	CC 46, discipline of professional training
Course / semester	5-th year (VII semesters)
The amount of discipline (the total number of hours / number of credits ECTS)	60 hours / 2,0 credit ECTS
Number of content modules	1 module
The structure of the discipline	Lectures - 10 hours Practical classes 30 hours Independent work 20 hours In general: auditory classes – 66,7%, independent work -33,3%
Language of study	English
Form of study	Full-time (or remote full-time by order)

2. Description of the discipline

Short annotation of the course, relevance.

The program of the discipline "Drug Toxicology" is compiled in accordance with the procedure for training applicants for the second (master's) level of education in higher medical educational institutions of Ukraine in accordance with the requirements of the ECTS credit transfer system for organizing the educational process, the exemplary curriculum for training specialists of the second (master's) level of higher education in the field of knowledge 22 "Healthcare" specialty 226 "Pharmacy, industrial pharmacy".

The discipline is a mandatory component of the educational and professional program "Pharmacy", a cycle of professional training for a master's degree in pharmacy, designed for 2 credits, which applicants acquire during the IX or X semesters of the 5th year of study.

The main focus of the program is to obtain knowledge in the discipline "Medical Toxicology", the study of which is necessary for successful professional activity.

Medical toxicology is a science that studies the mechanisms of action of drugs in toxic and subtoxic doses on the human body and develops methods for the diagnosis, treatment and prevention of drug poisoning. The discipline involves studying the theoretical foundations of modern approaches to assessing the toxic properties of new drugs; general patterns of toxicokinetics of drugs; toxicodynamics of drugs, a complex of toxicometric parameters that characterize the degree of toxicity and the danger of poisoning, possible sources and routes of poison entry into the body. The need to familiarize students with these issues is due to the peculiarities of modern pharmaceutical care and the presence of a significant arsenal of drugs on the pharmaceutical market. Studying the discipline will expand students' awareness in areas close to their future specialty, will contribute to the acquisition of skills and abilities to recognize the degree of safety of potent drugs. The knowledge gained will help future specialists provide qualified advice when choosing effective and safe treatments, as well as meet today's needs for a new type of specialist with a high level of knowledge.

Prerequisites. For successful mastering of discipline, the student needs the knowledge received in the course of studying of the following disciplines of the general preparation: latin, ethics, philosophy, ecology, medical biology, medical chemistry, biological and bioorganic chemistry, biophysics, human anatomy, pathological anatomy, physiology, pathological physiology, microbiology, pharmacology.

The goal of the discipline is to provide each student with theoretical knowledge and practical skills regarding the basic principles of rational and safe use of medicines for human health, taking into account the occurrence of possible adverse reactions. Achieving the goal will prepare students for practical activities, high-quality performance of functional duties related to the rational selection of medicines, which will contribute to reducing the frequency of adverse reactions to medicines, preventing polypharmacy and drug-induced illness.

Postrequisites. As a training discipline "Drugs Toxicology" lays the foundations for the study by students of clinical pharmacology and pharmacotherapy and the formation of skills to apply knowledge of pharmacology in the process of further study of all clinical disciplines and in future professional activities.

3. Learning outcomes.

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

- adhere to the rules of ethics and deontology, solve a set of tasks related to the relationship between a doctor, clinical pharmacist and patient;
- analyze the results of observations of pharmacokinetics and pharmacodynamics of drugs;
- choose the necessary set of observation methods to assess the pharmacodynamic effects of drugs and interpret the obtained data or choose methods of adequate control over the effectiveness and safety of treatment;
- predict the risk of developing side effects of drugs;
- make an adequate selection and prescribe the most effective and safe drugs;
- determine the optimal dosage regimen, choose the dosage form, frequency and duration of drug administration.

4. Content and logistic of the discipline

<i>Content module 1. Drug Toxicology</i>	X semester 60 h	Lecture № 1-5 Practical class № 1-15 ISWN № 1-15
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The course includes 15 topics, 1 thematic modules.

Content module 1. Side Effects of Drugs

Topic 1-2. Subject, goals and objectives of drug toxicology. The concept of basic terms of drug toxicology. Causes of different sensitivity of the body to the toxicant. Importance of physicochemical properties of drugs for their toxicity. Classification of drugs by their toxic effects. Toxicometry and toxicokinetics. Rules for conducting forensic medical examinations (research) in the forensic toxicology departments of the forensic medical examination bureau.

Topic 3. Mechanisms of toxic action of drugs. General principles of poison diagnostics. Principles of detoxification of the body in poisoning. Antidotes

Topic 4. Toxicity of narcotic analgesics

Topic 5. Toxicity of antipsychotic drugs (neuroleptics).

Topic 6. Toxicity of antidepressants

Topic 7. Toxicity of oral hypoglycemic agents

Topic 8. Toxicity of drugs with activity of adrenal cortex hormones

Topic 9. Toxicity of drugs with activity of thyroid and pituitary hormones

Topic 10-11. Toxicity of anti-blastomas

Topic 12. Toxicity of antihypertensive drugs

Topic 13. Toxicity of anticoagulants and antiplatelet agents, thrombolytics

Topic 14. Toxicity of heavy metals, arsenic, lead, mercury

Topic 15 Differential credit

The lecture course discovers the problematic issues of the relevant sections of drug toxicology.

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

1) providing pharmacological and pharmacotherapeutic characteristics of medicinal products, logically linking the mechanism of action with pharmacodynamics, pharmacodynamics with indications, and side effects with contraindications to their use;

2) determination, depending on the characteristics of the pharmacokinetics of drugs, the frequency of taking the drug, its daily dose, course dose in patients of different ages according to concomitant diseases and the use of other drugs;

3) forecasting the consequences of the interaction of drugs when they are combined, drugs and food components, drugs and alcohol;

4) assessment of the benefit/risk ratio when using medicines;

5) predicting the risk of developing a side effect of drugs; determination of manifestations of possible adverse drug reactions, symptoms of overdose with potent and poisonous drugs, methods of their prevention and principles of treatment;

6) creation of an algorithm for helping patients with acute drug poisoning with the use of antidotes in each specific case;

7) provision of comparative characteristics of medicinal products based on indicators of effectiveness, safety, mechanism of action, indications for use, etc.;

8) filling out the notification card about side effects of medicines.

In practical classes, students solve clinically-oriented situational problems and test tasks.

Independent work of students involves preparation for practical classes and final control. The control of students' independent work is carried out during the current control of the topic in the relevant classroom.

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

The route for obtaining materials: Department of Clinical Pharmacy and Clinical Pharmacology / Student / Full-time / Medicine / 4th year / Educational and methodical materials / or by the link <https://www.vnmue.edu.ua/> Department of Clinical Pharmacy and Clinical Pharmacology #. Access to materials is provided from 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, electronic survey, solving situational problems.
Final control of the discipline - differential credit	Methods: 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, clinically-oriented situational tasks.
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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.vnmua.edu.ua/General> information)

Continuous assessment	On a four point system of traditional assessments: 5 «excellent», 4 «good», 3 «satisfactory», 2 «unsatisfactory»
Final control of the discipline	Final differential credit test 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	credited
121-61	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

Evaluation of the oral / written answer during the current control

“Excellent” grade

The student must know the features of the mechanism of action, classification, toxicokinetics, toxicodynamics, side effects, interaction of different groups of drugs. Methods of their administration,

methods for assessing the effectiveness of the action, duration of the action of the drug. Selection of drugs taking into account the above criteria and the functional state of the body, gender, age of the patient. Rational combinations of therapy. Dose range. Mechanism of toxic action. Factors that increase and decrease toxicity. Therapy of acute poisoning. Prevention and immediate therapy measures in the event of complications from treatment. Answers must be deep, meaningful and specific. The student correctly, clearly, logically and fully answers all standardized questions on the current topic, is able to summarize the material.

"Good" grade

The student must know the features of the mechanism of action, classification, pharmacokinetics, pharmacodynamics, side effects, interaction of different groups of drugs. Mechanism of toxic action. Factors that increase and decrease toxicity. Acute poisoning therapy. The answers are sufficiently meaningful and specific. The student correctly and essentially answers standardized questions on the current topic. Possesses the necessary practical skills and abilities in an amount exceeding the required minimum.

"Satisfactory" grade

The student must possess the mandatory minimum of theoretical knowledge and practical skills - to know representatives of drug groups, features of pharmacokinetics, pharmacodynamics, side effects of drugs, methods of administration. The answers are incomplete, knowledge is superficial.

"Unsatisfactory" grade

The student does not possess the mandatory minimum of knowledge regarding drug toxicology, is not oriented in issues of pharmacokinetics, pharmacodynamics, side effects of drugs, features of their interaction, methods of therapy control and measures for immediate assistance in case of complications. The answers are imprecise, incorrect, or completely absent.

Evaluation of test tasks during the current control

The grade **"excellent"** is given to the student who at carrying out test control is allowed no more than 10% of incorrect answers (volume of correct answers 90-100%).

A grade of **"good"** is given to a student who makes no more than 20% of mistakes during the test (the amount of correct answers is 80-89%).

A grade of **"satisfactory"** is given to a student who makes mistakes in no more than 30% of test tasks (the amount of correct answers is 70.5-79%).

A grade of **"unsatisfactory"** is given to a student who correctly solves less than 70% of the test tasks in a test.

Evaluation of the implementation of situational tasks during the current control

The grade **"excellent"** is given to the student freely solves situational clinically-oriented problems of increased complexity, correctly, clearly, logically and fully answers all components of the problem.

A grade of **"good"** is given to the student who is able to solve light and medium situational clinically-oriented problems, while correctly and essentially answers most questions to the problem, correctly uses theoretical knowledge in solving practical problems.

A grade of **"satisfactory"** when solving situational problems, provides correct answers to only some questions to the problem, or the answers are incomplete.

A grade of **"unsatisfactory"** when solving situational problems, he cannot provide the correct answers to the questions to the problem. The answers are vague, incorrect, or completely absent.

Assessment of independent students work

The calculation of individual points is carried out on the basis of the Regulation of the Academic process in VNMU named after M.I. Pyrogov (link <https://www.vnmua.edu.ua/General> information).

12 points are reserved for the ISW assessment, which are accrued as follows:

10 points - are added to the mark of the discipline - are added for prize-winning places at interuniversity competitions in the discipline and interuniversity and international scientific student conferences with the availability of published work.

9 points - are added for prizes at intra-university competitions and student scientific conferences with the presence of published work.

8 points - are added to the discipline for participation (if the student took part but did not receive a prize-winning place) in interuniversity competitions in the discipline and interuniversity and international scientific student conferences with the availability of published work.

6-7 points - are added to the discipline for participation (if the student took part but did not receive a prize) in intra-university competitions and student scientific conferences with the availability of published work.

4-5 points - for participation in the scientific research work of the department during extracurricular hours

1-3 points - are added to the mark of the discipline for making schemes, tables, multimedia presentations and videos - taking into account the importance of the work performed.

If the sum of points for ISW exceeds 12, the remaining points by the decision of the department meeting can be added as a bonus points to the score on the credit.

Students' independent work on a topic that is included in the thematic plan is assessed during the current control of the topic in the relevant lesson.

Final control assessment criteria

A student who was able to give an extensive answer to 3 theoretical questions and provided correct answers to test questions in the amount of at least 90% receives an **"Excellent" grade**, has thorough knowledge of the basics of biopharmacy, is clearly oriented in the consequences of the effects of various factors on the human body and in changes in the effectiveness and safety of pharmacotherapy. It is necessary to know the diagnostic criteria for alcoholism, smoking, excess body weight, disorders of the cardiovascular and respiratory systems. Know the basic patterns of pharmacotherapy depending on age characteristics and changes in the stages of pharmacokinetics. Know the molecular mechanisms of toxic reactions that occur under the influence of environmental factors.

A **"Good" grade** is given to a student who was able to give a complete answer to 3 theoretical questions and provided correct answers to test questions in the amount of at least 80%, possesses the material in the requirements listed above, but some errors are possible, insufficient awareness in individual questions and examples. The answers are sufficiently meaningful and specific. The student correctly and essentially answers standardized questions on the current topic. Possesses the necessary practical skills and abilities in an amount exceeding the required minimum.

A **"Satisfactory" grade** is given to a student who was able to give a partial answer to 3 theoretical questions and provided correct answers to test questions in the amount of at least 70%, possesses basic knowledge of biopharmacy and understands the mandatory minimum of concepts in the subject, the relationship of the action of drugs with the human body, in various conditions of its existence. The answers are incomplete, knowledge is superficial.

The grade **"Unsatisfactory"** is received by a student who was unable to give a detailed answer to at least 1 theoretical question and provided correct answers to test questions in the amount of less than

70%, has elementary knowledge of biopharmacy, has an idea of the content of the main sections. The student does not have a minimum of knowledge about the features of the action of drugs in different conditions of the human body, is not oriented in the need to correct treatment regimens depending on these conditions, the mechanisms of implementing the following new effects.

7. Policy of discipline / course

The student has the right to receive high-quality educational services, access to contemporary scientific and educational information, qualified tutoring 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 VNMU named after M.I.Pirogov and the principles of academic integrity (link <https://www.vnmua.edu.ua/General> information).

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

Safety instruction is given at the first practical session by the teacher.

ALGORITHM OF ACTION for education applicants, scientific and pedagogical workers of National Pirogov Memorial Medical University, Vinnytsia throughout the operation of the «AIR ALARM» during working hours

Before the first class starts, teacher must explain extensively how to get to the shelter.

The shelters of the Department of Clinical Pharmacy and Clinical Pharmacology are located at the ground floor of morphological building of the VNMU, the cellar-shelter of the hostel №3, the basement-shelter of the University Clinic of the VNMU, the basement - shelters of VCCH №3 in accordance with the base for conducting practical classes.

In case when the alarm signal sounds during the classes «AIR RAID! EVERYONE GOES TO THE NEAREST SHELTER» it is necessary to: Stop the class immediately; after the teacher announces: «Pack your things, quickly go to the shelter», quickly pack things and get ready to leave; make sure that there is no one left in the auditorium; turn off the light, close the door (mainly performed by the teacher); follow the last student to move to the shelter (performed by the teacher); stay at the shelter until the signal «CAUTION! ALL-CLEAR!» (two short sirens announcing same as for the sounding of the air alarm); after the signal «CAUTION! ALL-CLEAR!» return to the classroom to continue the lesson; if the signal «CAUTION! ALL-CLEAR!» do not occur before the end of the class, the education applicants should stay at the shelter until the signal «CAUTION! ALL-CLEAR!»; in case when the alarm signal «AIR RAID! EVERYONE GOES TO THE NEAREST SHELTER» sounds before the start of the class and the applicants arrive to the department base, the applicants must immediately go to the nearest shelter (QR code with a link to the map of the shelters of Vinnytsia city are sited at every public transport stop).

Requirements for preparation for practical classes.

The student must be prepared for a practical lesson, theoretically prepared for the topic.

Student should come to a class on time, without delay. 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.

When discussing theoretical issues, students should demonstrate tolerance, courtesy and respect for their colleagues and the teacher.

Usage of mobile phones and other electronic devices.

The use of mobile phones and other electronic devices during the lesson is allowed only at the instruction of the teacher.

Academic integrity. When studying the discipline, the student must be guided by the Code of Academic Integrity and Corporate Ethics of VNMU named after M.I. Pirogov (link: <https://www.vnmue.edu.ua/General> information)/ 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 VNMU named after M.I. Pirogov (link <https://www.vnmue.edu.ua/General> information) at the time of work out schedule (published on the website of the department [https://www.vnmue.edu.ua/ Department of Clinical pharmacy and clinical pharmacology#](https://www.vnmue.edu.ua/Department%20of%20Clinical%20pharmacy%20and%20clinical%20pharmacology#)) to the teacher on duty. To work out missed lesson student must provide a completed workbook protocol on the relevant topic, take a test and answer questions in writing or orally to the topic of the lesson.

The procedure for admission to the discipline final control is given in the Regulation of the Academic process in VNMU named after M.I. Pyrogov (link <https://www.vnmue.edu.ua/General> information). Students who do not have missed practical classes and lectures and received an average traditional grade of at least "3" are allowed to final control.

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 VNMU named after M.I. Pyrogov (link <https://www.vnmue.edu.ua/General> information) and policy of the course.

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 a right to apply to the head of the department according to Complaints Consideration Procedure ([https://www.vnmue.edu.ua/ General information / Basic documents](https://www.vnmue.edu.ua/General%20information%20-%20Basic%20documents)).

Politics in terms of remote learning. Distance learning regulated by the Regulations of the elements of remote learning in VNMU named after Pirogov M.I. ([https://www.vnmue.edu.ua/ General information](https://www.vnmue.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.vnmue.edu.ua/ Department of Clinical Pharmacy and Clinical Pharmacology/Student](https://www.vnmue.edu.ua/Department%20of%20Clinical%20Pharmacy%20and%20Clinical%20Pharmacology/Student) or [https://www.vnmue.edu.ua/Department of Clinical Pharmacy and Clinical Pharmacology / News](https://www.vnmue.edu.ua/Department%20of%20Clinical%20Pharmacy%20and%20Clinical%20Pharmacology/News)).

Feedback from teachers is via messengers, e-mail or on the Microsoft Teams platform (at the choice of the teacher) during working hours.

8. Educational resources.

Educational and methodological support of the discipline is published on the website of the department ([https://www.vnmue.edu.ua/ Department of Clinical Pharmacy and Clinical Pharmacology/ To students](https://www.vnmue.edu.ua/Department%20of%20Clinical%20Pharmacy%20and%20Clinical%20Pharmacology/To%20students)).

Recommended base reading:

1. Alves da Costa F., van Mil J.W.F., Alvarez-Risco A. The Pharmacist Guide to Implementing Pharmaceutical Care. – Springer Cham, 2019. 506 p.
2. Brunton L.L., Chabner B.A., Knollmann B.C. Goodman and Gilman's The Pharmacological Basis of Therapeutics (13-th Edition).-2017. 1423p.
3. Clinical Pharmacology / M. J. Brown, P. Sharma, F. A. Mir, P. N. Bennett. - twelfth edition. — Edinburgh-London-New York-Oxford-Philadelphia-St Louis-Sydney: Elsevier, 2019. — 706p
4. Katzung B.G., Masters S.B., Trevor A.J. Basic & Clinical Pharmacology (11-th Edition).- 2018.- 1547 p.
5. A textbook of modern toxicology / edited by Ernest Hodgson. —4th ed. - A JOHN WILEY & SONS, INC., PUBLICATION, 2010. – 670 p.

Recommended additional reading:

1. Drugs side effects / [Posokhova K.A., Oleshchuk O.M., Korda M.M., Shevchuk O.O., Cherniashova V.V.]. - 2023. - Ternopil : TNMU.– 286 p.
2. Lippincott Illustrated Reviews: Pharmacology / K. Whalen. — seventh edition. — Philadelphia: Wolters Kluwer, 2019. — 593 p.
3. Pharmacology / [edited by] Karen Whalen; collaborating editors, Richard Finkel, Thomas A. Panavelil. – Sixth edition. – 2015. (Lippincott illustrated reviews)
4. Pharmacology at your palms: reference book / Drogozov S.M., Kutsenko T.A. - Kharkiv: Nphall,2016,-80 p.
5. Pharmacology - Cito!: Textbook II Edited by S.M. Drogozov. - Kharkiv, 2016. -192 p.

Electronic resources:

1. Deartment website – <http://vnmu.edu.ua/>
2. Libraire website - <http://library.vsmu.edu.ua/>
3. State Register of Medicines www.moz.gov.ua
4. Unified patient management protocols www.moz.gov.ua
5. Australian Bulletin of Adverse Reactions.<http://www.tga.health.gov.au/adr/aadrb.htm>.
6. British Monthly Drug Safety Bulletin <http://www.mhra.gov.uk/Publications/Safetyguidance/DrugSafetyUpdate/index.htm>.
7. Lectures for postgraduate education "Principles of Clinical Pharmacology" of the Clinical Center of the National Institutes of Health. <http://www.cc.nih.gov/researchers/training/principles.shtml>.
8. Interregional Society of Evidence-Based Medicine: <http://www.osdm.org/index.php>
9. Bulletin of evidence-based medicine: <http://www.evidence-update.ru>
10. European Society of Clinical Pharmacologists and Pharmacotherapists: <http://www.eacpt.org>
11. Resource on pharmacogenetics. <http://www.pharmgkb.org/>.
12. On-line registration of adverse drug reactions on the FDA website. <https://www.accessdata.fda.gov/scripts/medwatch/medwatch-online.htm>.
13. Resource for drug interaction: <http://medicine.iupui.edu/flockart/>
14. Working group on pharmacotherapy of the European Society of Cardiology <https://www.escardio.org/>.

Consultations are held once a week according to the consultation schedule.

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

10. Questions to the final discipline control (credit) are published on the web page of the department (<https://www.vnmua.edu.ua/> Clinical pharmacy and clinical pharmacology department/ For students).

The syllabus of the discipline «Side effects of drugs» was discussed and approved at the meeting of the clinical pharmacy and clinical pharmacology department (record № 1, dated 27.08.2025)

Responsible for academic
discipline



ass. prof. of HEI Inna DOROHKEVYCH

Head of the department



ass. prof. of HEI Sviatoslav SEMENENKO