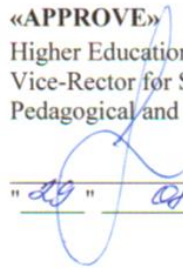


National Pirogov Memorial Medical University, Vinnytsya

«APPROVE»

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


"29" "08" 2025 Inna ANDRUSHKO

«AGREED»

Head of clinical pharmacy and
clinical pharmacology department


"29" "08" 2025 Sviatoslav SEMENENKO

**SYLLABUS
of academic discipline**

PRACTICE OF CLINICAL PHARMACY

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

1. Status and structure of the discipline

Discipline status	Compulsory
Discipline code in EPP/discipline place in EPP	CC 54, discipline of professional training
Course / semester	4-5th year (VII-IX semesters)
The amount of discipline (the total number of hours / number of credits ECTS)	135 hours / 4,5 credit ECTS
The structure of the discipline	Practical classes 60 hours Independent work 75 hours In general: auditory classes – 44,4%, independent work - 55,6%
Language of study	English
Form of study	Full-time (<i>or remote full-time by order</i>)

2. Description of the discipline

Short annotation of the course, relevance.

The program of industrial pharmaceutical practice in the specialization "Practice in Clinical Pharmacy" 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 the main component of the educational and professional program "Pharmacy, industrial pharmacy", the cycle of professional training for the Master of Pharmacy is designed for 4.5 credits, which applicants acquire during the X semester for the 5th year of study for full-time study, during the IX semester (4.5 years of study) and XI semester (5.5 years of study) for part-time study.

The subject area of the program is to create conditions for effective orientation of the future specialist in the professional space, in his assimilation of the environment and models of professional behavior. Industrial practice should consolidate and deepen the theoretical knowledge obtained by students, instill in them practical skills and abilities to apply this knowledge in practical activities.

The participation of a pharmacist in drug therapy contributes to the timely delivery of optimal quality drugs to the patient, the establishment of the most rational routes and modes of administration, the prevention of the appointment of incompatible drugs, the minimization of their side effects, and the reduction of polypharmacy. Clinical pharmacy practice is a theoretical and practical basis for preparation for advisory work among doctors and patients on issues of rational drug therapy, as well as for the implementation of pharmaceutical care for patients.

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:

pharmacology, pharmacotherapy, medical biology, physiology and pathological physiology with the basics of pathological anatomy, microbiology, general pharmacokinetics, medical and

pharmaceutical ethics and deontology, clinical and laboratory diagnostics, which precede the study of the discipline or are studied simultaneously.

The purpose of the course and its significance for professional activities. The purpose of teaching the discipline is to consolidate practical skills and train pharmacists who would have sufficient theoretical knowledge and practical skills to work with a doctor to ensure the most rational drug therapy for a particular patient, as well as for pharmaceutical care of patients in pharmacies.

Postrequisites. As a discipline "Clinical Pharmacy and Pharmaceutical Care" lays the foundation for students to study related disciplines such as medical chemistry and medical biochemistry, pharmacognosy, pharmacoeconomics, whose programs complement the integrated discipline, which is basic in the cycle of clinical disciplines for pharmacists.

3. Learning outcomes.

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

- identify the characteristic clinical symptoms of the most common diseases that require mandatory medical advice;
- recognize diseases and pathological conditions in which responsible self-medication is possible, and their characteristic clinical manifestations;
- to advise doctors on the advantages or disadvantages of a particular dosage form of specific drugs of different pharmacological groups;
- to determine methods and criteria for assessing the clinical effectiveness of drugs of the main pharmacological groups;
- to reproduce the algorithm for selecting the optimal over-the-counter drugs for the treatment of diseases and pathological conditions in which responsible self-medication is possible;
- analyze the results of observations of pharmacokinetics and pharmacodynamics of drugs;
- choose the necessary set of monitoring methods to assess the pharmacodynamic effects of drugs and interpret the data obtained or choose methods of adequate control over the effectiveness and safety of treatment;
- anticipate the risk of side effects of drugs;
- fill in the card-notification (form 137 / o) about side effects of medicines;
- 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. Fulfilling the duties of a pharmacist at the workplace "at the first table" in a pharmacy.</i>	X semester 135 hours	Practical class. № 1-3 ISW № 1-3
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The course includes 1 thematic module.

MODULE 1. PRACTICAL TRAINING IN CLINICAL PHARMACY BASED ON A PHARMACY INSTITUTION.

Content module 1. Fulfilling the duties of a pharmacist at the workplace "at the first table" in a pharmacy.

Topic 1. Familiarization with the basis for practical training and the organization of information work in a pharmacy. Familiarization with the ethical and deontological aspects of communication between a pharmacist and a pharmacy visitor.

Topic 2. Prescription and over-the-counter dispensing of medicines

Topic 3. Reporting on the completion of practice. Final control, differential credit.

The topics of the lecture course reveal the problematic issues of the relevant sections of clinical pharmacy practice.

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

- 1) analysis of prescriptions for drugs in various dosage forms in accordance with modern legislation of Ukraine;
- 2) determination of group affiliation of medicines according to modern classifications;
- 3) providing pharmacological and pharmacotherapeutic characteristics of drugs, logically link the mechanism of action with pharmacodynamics, pharmacodynamics with indications, and side effects with contraindications to their use;
- 4) independently calculate a single dose of the drug depending on age, body weight or body surface area of the patient;
- 5) determination, depending on the pharmacokinetics of drugs, the frequency of drug intake, its daily, course dose in patients of different ages in accordance with comorbidities and the use of other drugs;
- 6) forecasting the consequences of the interaction of drugs in their combined administration, drugs and food components, drugs and alcohol;
- 7) determination of manifestations of possible side effects of drugs, symptoms of overdose of potent and poisonous drugs, methods of their prevention and principles of treatment;
- 8) creation of an algorithm to help patients with acute drug poisoning with the use of antidotes in each case;
- 9) to determine the characteristic clinical symptoms of the most common diseases that require mandatory medical consultation;
- 10) to recognize diseases and pathological conditions in which responsible self-treatment is possible, and their characteristic clinical manifestations;
- 11) to reproduce the algorithm for selecting the optimal over-the-counter drugs for the treatment of diseases and pathological conditions in which responsible self-medication is possible.

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 / Pharmacy, industrial pharmacy / 4-5th year / Educational and methodical materials / or by the link <https://www.vnmua.edu.ua/> Department of Clinical Pharmacy and Clinical Pharmacology #. Access to materials is provided from the student's corporate account s000XXX@vnmua.edu.ua.

5. Forms and methods of monitoring academic performance

Current control in practical studies	Methods: oral or written survey, solving situational problems.
Final control of the discipline - differential credit	Methods: oral questioning (according to the Regulation of the Academic process in VNMU named after M.I. Pirogov (link https://www.vnmu.edu.ua/General information))
Learning success diagnostic tools	Theoretical questions, clinically-oriented situational tasks.

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 <https://www.vnmu.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

Grade “Excellent”

The student must know the features of the mechanism of action, classification, pharmacokinetics, pharmacodynamics, side effects, interaction of different groups of drugs. Methods of their administration, methods of assessing the effectiveness of the action, duration of the drug action. 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. 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 generalize the material. The student correctly and completely performs the tasks, systematically works on the basis of practice according to the plan. Submits materials on time for checking by the teacher, correctly draws up diaries and analyzes the tasks set.

Grade “Good”

The student must know the features of the mechanism of action, classification, pharmacokinetics, pharmacodynamics, side effects, interaction of different groups of drugs. Methods of their administration, methods for assessing the effectiveness of the action. The choice of drugs taking into account the above criteria and the functional state of the body, gender, age of the patient. The answers are sufficiently meaningful and specific. The student correctly performs the tasks, systematically works on the basis of practice according to the plan. Submits materials on time for checking by the teacher, correctly draws up diaries and analyzes the tasks set. Possesses the necessary practical skills and abilities in an amount exceeding the required minimum.

"Satisfactory" grade

The student must have the required minimum of theoretical knowledge and practical skills - to know the representatives of drug groups, the features of pharmacokinetics, pharmacodynamics, side effects of drugs, methods of administration. The answers are incomplete. The student performs the tasks incompletely, systematically works on the basis of practice according to the plan. Submits materials on time for checking by the teacher, draws up diaries and analyzes the tasks set superficially.

"Unsatisfactory" grade

The student does not have the required minimum of knowledge about clinical pharmacy, is not oriented in the issues of pharmacokinetics, pharmacodynamics, side effects of drugs, the 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. The student performs the tasks incompletely. Submits materials late for checking by the teacher, draws up diaries and analyzes the tasks set incorrectly.

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.vnmu.edu.ua/General> information).

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

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 in the classroom is allowed only during electronic testing or surveys.

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.vnmu.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.vnmu.edu.ua/General> information) at the time of work out schedule (published on the website of the department [https://www.vnmu.edu.ua/ Department of Clinical pharmacy and clinical pharmacology#](https://www.vnmu.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 reworking of missed lectures is carried out after providing a thesis of lecture material, or writing an abstract, or preparing own presentation on the topic of missed lecture.

The procedure for admission to the discipline final control is given in the Regulation of the Academic process in VNMU named after M.I. Pirogov (link <https://www.vnmu.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. Pirogov (link <https://www.vnmu.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.vnmu.edu.ua/ General information / Basic documents](https://www.vnmu.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.vnmu.edu.ua/>

General information). 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 or <https://www.vnmue.edu.ua/Department of of Clinical Pharmacy and Clinical Pharmacology / News>).

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.vnmue.edu.ua/> Department of Clinical Pharmacy and Clinical Pharmacology/ To students).

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. Nathan A. Non-Prescription Medicines. 2020. 320 p.

Recommended additional reading:

1. Bobyrov V. Pharmacology : textbook / V.Bobyrov, T.Devyatkina, O.Vazhnicha, V.Khristyuk. - 3rd ml ., updated - Vinnitsya : Nova Knyha, 2015. -520 p.: il.
2. Drugs side effects / [Posokhova K.A., Oleshchuk O.M., Korda M.M., Shevchuk O.O., Cherniashova V.V.]. - 2023. - Ternopil : TNMU.– 286 p.
3. Lippincott Illustrated Reviews: Pharmacology / K. Whalen. — seventh edition. — Philadelphia: Wolters Kluwer, 2019. — 593 p.
4. Pharmacology / [edited by] Karen Whalen; collaborating editors, Richard Finkel, Thomas A. Panavelil. – Sixth edition. – 2015. (Lippincott illustrated reviews)
5. Pharmacology: textbook: in 2 parts. Part 1 / I. Yu. Vysotsky, R. A. Khramova, A. A. Kachanova. — Sumy: Sumy State University, 2019. — 311 p
6. Pharmacology: textbook: in 2 parts. Part 2 / I. Yu. Vysotsky, R. A. Khramova, A. A. Kachanova. — Sumy: Sumy State University, 2020. — 569 p.
7. Pharmacology at your palms: reference book / Drogozov S.M., Kutsenko T.A. - Kharkiv: Nphall,2016,-80 p.
8. Pharmacology - Cito!: Textbook II Edited by S.M. Drogozov. - Kharkiv, 2016. -192 p.

Electronic resources:

1. Deartment website – <http://vnmue.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 twice 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.vnmu.edu.ua/> Clinical pharmacy and clinical pharmacology department/ For students).

The syllabus of the discipline of industrial practice with the specialization "PRACTICE OF CLINICAL PHARMACY" 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