

National Pirogov Memorial Medical University, Vinnytsia

«APPROVE»

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

"29" August 2025 year

«AGREED»

Head of the Department of Pharmacy
Olena KRYVOVIAZ

"29" August 2025 year

SYLLABUS
of academic discipline

PHARMACEUTICAL LOGISTICS:
THE WAY OF THE DRUG FROM PRODUCER TO CONSUMER

Specialty	226 Pharmacy, Industrial Pharmacy
Specialization	226.01 Pharmacy
Educational level	the second (master`s) level
Educational programme	<i>EPP «Pharmacy» 2023</i>
Academic year	2025-2026
Department	Pharmacy
Lecturer (if lectures are given)	Prof. Olena KRYVOVIAZ, Ass. Prof. Yulia TOMASHEVSKA, PhD, Ass. Prof. Hanna KRAMAR
Contact information	<i>pharmacy@vnmuedu.ua</i>
Syllabus compiler	Ass. Prof. Hanna KRAMAR

Status and structure of the discipline

Discipline status	optional courses
Discipline code in EPP/ discipline place in EPP	EC 40// optional courses, optional components of EP
Course / semester	4 rd course (VII semester)
The amount of discipline (the total number of hours / number of credits ECTS)	90 hours /3,0 credits ECTS
Number of content modules	1 modules
The structure of the discipline	Lectures – 10 hours Practical classes - 30 hours Independent work – 50 hours
Language of study	English
Form of education	Full - time (or remote/mixed according to the order)

1. Description of the discipline

Brief annotation, actuality.

The elective course "Pharmaceutical Logistics: the way of the drug from producer to consumer" belongs to the cycle of disciplines for the professional-oriented training of specialists in specialty 226 "Pharmacy, Industrial Pharmacy". Specialisation 226.01 Pharmacy. The discipline lays the foundation for higher education students' knowledge of modern trends in the development of pharmaceutical technology and professional activities in Ukraine and abroad, and is a link between theoretical disciplines that form the profile of a Master of Pharmacy.

The course focuses on understanding the place of a pharmaceutical representative in pharmaceutical logistics, methods for determining the optimal size of drug stocks, ways to reduce lost sales in the absence of the necessary medicines, and skills for strengthening the relationship between sellers and buyers.

As a result of studying the discipline, higher education students should:

know

- basic regulatory documents;
- stages of the warehouse technological process;
- stages of building a logistics chain;
- develop routes and schedules of vehicles;
- be able to rationally manage stocks

be able to:

- identify the flows of pharmaceutical logistics;
- find the difference between functional and auxiliary types of pharmaceutical logistics;
- understand the concepts of: direct route sales, pre-sales, telemarketing, e-commerce;

Prerequisites.

The discipline is based on the study of the way of medicines from the manufacturer to the consumer, and also uses as prerequisites such disciplines of the curriculum as Introduction to Pharmacy (basic interdisciplinary interactions in pharmacy, concepts of drug technology and biopharmacy), Pharmacology (pharmacological groups of drugs), Drug development.

The purpose of the course and its significance for professional activities: The purpose of teaching the discipline is to provide an opportunity to understand the concept of "pharmaceutical logistics" and the stages of drug promotion to the pharmaceutical market, as well as to understand the responsibilities of a pharmacist in various areas of product promotion.

Prerequisites.

The discipline is the basis for the study of disciplines: "Drug Technology: Industrial Technology of Medicines", "Technology of Medicinal Cosmetics", "Pharmaceutical and Medical Commodity Research", "Organization of Pharmacy Economics", which involves the integration of teaching with the above disciplines and the formation of skills to apply knowledge in the process of further study and in professional activities.

2. Learning outcomes.

Competencies and learning outcomes contributed to by the discipline:

- **Integral (IC):** Ability to solve complex problems and critically comprehend and solve practical problems in professional pharmaceutical and/or research and innovation activities using the provisions, theories and methods of fundamental, chemical, technological, biomedical and socio-economic sciences; integrate knowledge and solve complex problems, formulate judgments with insufficient or limited information; clearly and unambiguously communicate own knowledge, conclusions and their validity to professional and non-specialist audiences.

- **General competencies (GC):**

LC 02. Ability to apply knowledge in practical situations.

LC 03. Knowledge and understanding of the subject area and understanding of professional activity

LC 04. Ability to think abstractly, analyse and synthesise, learn and be modernly educated.

LC 06. Knowledge and understanding of the subject area and understanding of the profession.

SC 07. Ability to choose communication strategies, ability to work in a team and with experts from other fields of knowledge/types of economic activity.

SC 08. Ability to evaluate and ensure the quality of work performed.

SC 11. Ability to evaluate and ensure the quality of work performed.

- **Special (Professional, subject) competencies (PC):**

PC 01. Ability to collect, interpret and apply data necessary for professional activities, research and implementation of innovative projects in the field of pharmacy.

PC 03. Ability to solve pharmacy problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility.

PC 04. Ability to use knowledge of regulatory and legislative acts of Ukraine and recommendations of good pharmaceutical practices in professional activities.

PC 05. Ability to demonstrate and apply in practical activities communication skills, fundamental principles of pharmaceutical ethics and deontology based on moral obligations and values, ethical standards of professional conduct and responsibility in accordance with the Code of Ethics for Pharmaceutical Workers of Ukraine and WHO guidelines.

PC 06. Ability to clearly and unambiguously convey one's knowledge, conclusions and arguments in the field of pharmacy to specialists and non-specialists, in particular to students.

PC 11. Ability to ensure the proper storage of medicines and other pharmacy products in accordance with their physical and chemical properties and Good Storage Practice (GSP) rules in healthcare facilities.

PC 12. Ability to use knowledge of regulatory and legislative acts of Ukraine and recommendations of good pharmaceutical practices in professional activities.

PC 14. Ability to analyse and forecast the main economic indicators of pharmacy establishments, calculate basic taxes and fees, and set prices for medicines and medical devices in accordance with the current legislation of Ukraine.

PC 15. Ability to organise and implement general and marketing management of assortment, product innovation, pricing, sales and communication policies of pharmaceutical market entities based on the results of marketing research and taking into account market processes in national and international markets, manage risks in the pharmaceutical supply system.

PC 16. Ability to develop and implement a quality management system for pharmaceutical companies in accordance with the requirements of current standards, to conduct quality audits and risk management for the quality of pharmaceutical products.

PC 22. Ability to organise and carry out quality control of medicinal products in accordance with the requirements of the current State Pharmacopoeia of Ukraine and good pharmacy practices, determine methods for sampling medicinal products for control and standardise them in accordance with current requirements, prevent the spread of counterfeit medicinal products.

- **Program learning outcomes for the discipline:**

PLO 01. Conduct professional activities in social interaction based on humanistic and ethical principles; identify future professional activities as socially significant for human health.

PLO 02. Apply knowledge of general and professional disciplines in professional activities.

PLO 03. Comply with sanitary and hygienic regulations and safety requirements when performing professional activities.

PLO 04. Demonstrate the ability to independently search for, analyse and synthesise information from various sources and use these results to solve typical and complex specialised tasks of professional activity.

PLO 05. Position one's professional activities and personal qualities in the pharmaceutical labour market; formulate the goals of one's own activities, taking into account social and production interests.

PLO 07. Perform professional activities using creative methods and approaches.

PLO 08. Develop and make effective decisions to solve complex/comprehensive pharmacy tasks personally and based on the results of joint discussions; formulate the goals of one's own activities and those of the team, taking into account social and production interests, overall strategy and existing limitations, and determine the optimal ways to achieve these goals.

3. Content and logistics of the discipline

Module 1: «Pharmaceutical logistics: the way of the drug from producer to consumer»	7 semester 90 hours /3 credits ECTS	Lectures №5 Practical classes №15 Extracurricular work №8
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The course includes 14 topics, which are divided into 1 thematic module.

Topic 1. The occurrence and stages of development of pharmaceutical logistics and areas of improvement.

Topic 2. Logistics strategy of a pharmaceutical company. Targets, mechanisms of formation.

Topic 3. Components of the enterprise logistics system. Rationalization of the organization of logistics processes at pharmaceutical enterprises.

Topic 4. State regulation of logistics processes in pharmacy. The main regulatory documents.

Topic 5. Demand management. Harmonization of demand and production.

Topic 6. Production logistics: concept, functions, content and importance. Types of production planning.

Topic 7. Production logistics: resource management of pharmaceutical companies

Topic 8. Supply logistics: basic concepts of procurement logistics.

Topic 9. Supply logistics: inventory management models.

Topic 10. Warehouse logistics: the basic principles of placing and picking goods.

Topic 11. Transport logistics: concepts, current trends.

Topic 12. Customs logistics. Regulatory regulation of international transportation.

Topic 13. Sales policy in the activities of pharmaceutical companies.

Topic 14. Information policy in the supply chain.

The topics of the lecture course reveal problematic issues of the relevant sections of the discipline.

Lecture methods: not taught in class, materials are posted on the department's information resources.

Practical classes provide theoretical substantiation of the main issues of the topic and contribute to the formation of skills:

- identify the flows of pharmaceutical logistics;
- distinguish between functional and auxiliary types of pharmaceutical logistics;

- understand the concepts of direct route sales, pre-sales, telemarketing, e-commerce;
- know and use the functions performed by the wholesale trade;
- create orders;
- determine order volumes and negotiate sales.

The independent work of higher education students involves preparation for practical classes and intermediate controls, studying topics for independent out-of-class work, writing essays, preparing presentations, tables. The control of mastering the topics of independent out-of-class work is carried out at intermediate control classes and final control in the discipline.

Individual work includes the study of scientific literature, preparation of reviews on the topics provided for presentation at the meetings of the student scientific circle, the implementation of scientific and practical researches, participation in specialized competitions, scientific and practical conferences and organization of students' research works.

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: Department of Pharmacy / for students / Full-time education / Pharmacy, industrial pharmacy / 4 course / Educational materials / or through the link <https://www.vnmu.edu.ua/кафедра-фармації#>.. Access to the materials is carried out through the student's corporate account s000XXX@vnmu.edu.ua.

4. Forms and methods of monitoring academic performance

Current control in practical studies	Methods: <i>oral or written survey, testing, electronic survey, solving situational problems, conducting laboratory studies, interpreting them and evaluating their results (drawing up a protocol in a workbook)</i>
Final semester control (credit) at the end of the III semester	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, tests, situational tasks, practical tasks, practical skills demonstration

5. 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»
Credit:	On a 200-point scale (the arithmetic mean grade for the semester is converted into points) Pass: from 122 to 200 points Not credited: less than 122 points (see grading scale)

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
170-179,99	B	good	
160-169,99	C		
141-159,99	D	satisfactory	
122-140,99	E	satisfactory	
0-121,99	FX	unsatisfactory with the possibility of reassembly	is not credited with the possibility of reassembling
	F	unsatisfactory with a mandatory reexamination of discipline	is not credited with mandatory reexamination of discipline

6. 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 VNMU named after M.I.Pirogov 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.

The safety briefing shall be conducted by the instructor at the first practical lesson. The briefing shall be recorded in the Safety Briefing Log. A student who has not been briefed is not allowed to participate in practical training.

In case of announcement of the "Air Alert" signal or other warning signals, the teacher stops the class, informs the higher education students about the need to go to the civil defense shelter and stay there until the signal is canceled. The teacher informs higher education students of further actions after the signal is canceled: to continue the class or to recommend that they independently finalize the material with a subsequent survey at the next class (Order No 92 of 03.09.2024).

Requirements for preparation for practical classes. The student must be prepared for a practical lesson, tasks to prepare for the current topic must be completed.

A student must come to class on time. A student who is late is not allowed to study and must work it in the prescribed manner.

In practical classes, the student must be dressed in a work uniform. Students who do not have a work uniform are not allowed to study.

The student must follow the rules of safety in practical classes and during the stay in the department.

When discussing theoretical issues, students should demonstrate tolerance, courtesy and respect for their colleagues and the teacher; when performing practical tasks, the workplace should be kept in order and be cleaned after performing practical work.

Usage of mobile phones and other electronic devices. The use of mobile phones and other electronic devices in the classroom is allowed only on the instructions 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.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 VNMU named after M.I. Pirogov (link [https://www.vnmdu.edu.ua/General information](https://www.vnmdu.edu.ua/General%20information)) at the time of work out schedule to the teacher on duty.

The procedure for admission to the discipline final control is given in the Regulations of the Academic process in VNMU named after M.I. Pirogov (link [https://www.vnmdu.edu.ua/General information](https://www.vnmdu.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 (from 1 to 12) that student can receive for individual work, the amount of which is published on the website of the department in the educational methodical materials of the discipline, the number of points is determined by the results of IRS according to Regulation of the Academic process in VNMU named after M.I. Pirogov.

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, in VNMU named after M.I. Pirogov.

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. The procedure for conducting practical classes and lectures, practicing and consultations during distance learning is published on the department's website.

Feedback from teachers carried out through a distance learning platform (Microsoft Teams) is via messengers or e-mail (at the teacher's choice) during working hours.

Higher education applicants have the right to receive quality educational services, access to up-to-date scientific and educational information, qualified advisory assistance in the study of the discipline and mastery of practical skills. The policy of the department in the provision of educational services is student-centered, based on the regulations of the Ministry of Education and the Ministry of Health of Ukraine, the university charter and the procedure for the provision of educational services, regulated by the basic provisions of the organization of the educational process at the Pirogov National Medical University and the principles of academic integrity.

7. Educational resources.

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

8. The timetable and distribution of groups with assigned teachers are published on the web page of the department (<https://www.vnmdu.edu.ua/кафедра-фармації#> / for students).

9. Questions to the intermediate and final semester control (credit) of the discipline are published on the web page of the department (<https://www.vnmdu.edu.ua/кафедра-фармації#> / for students).

Recommended literature

1. Basics of Economics in Healthcare. Lecture notes study guide. Independent electronic edition. - Kharkiv : National University of Pharmacy, 2024. - 154 p.

2. Pharmacoeconomics: manual for students of higher schools / L. V. Iakovlieva, O. O. Gerasymova, O. V. Tkachova, O. Ia. Mishchenko; Edited by Prof. L. V. Iakovlieva. 2-nd edition, revised and expanded. Independent electronic edition. Kharkiv: National University of Pharmacy, 2023. 154

3. The study of modern trends in the development of digital logistics in the pharmaceutical industry. (2022). Social Pharmacy in Health Care, 8(1), 34-50. <https://doi.org/10.24959/sphhej.22.244>

4. Yuriy Safonov, Olha Korotun, Viktoriia Khmurova STRATEGIC IMPERATIVES FOR DIGITISATION OF THE UKRAINIAN PHARMACEUTICAL INDUSTRY // Baltic Journal of Economic Studies, 2024, №2.

5. Shiwani Sharma, Devika Kannan, Jyoti Dhingra Darbari, P. C. Jha, Chunguang Bai & Mark Christian Barrueta Pinto. (2025) An integrated model for analysis of risks in outsourcing to third-party for sustainable reverse logistics implementation by SMEs. Annals of Operations Research 351:3, pages 1989-2031.

6. Lisna, A., Posilkina, O., & Litvinova, O. (2024). Digital logistics as a tool for minimizing logistics risks in the activities of pharmaceutical enterprises. *Annals of Mechnikov's Institute*, (2), 13-18.

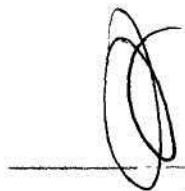
7. Saâdia Chabel, El Miloud Ar-Reyouchi. Technological Integration in Pharmaceutical Logistics. *Advances in Transdisciplinary Engineering*, 2023. *Advances in Transdisciplinary Engineering*,

Information resources

1. E-mail address of the university website: <http://vnmuedu.ua>
2. E-mail address of the university library website: <http://library.vnmuedu.ua>
3. E-mail address: Department of Pharmacy, Pirogov National Medical University: <http://www.vnmuedu.ua>
4. World Health Organization <http://www.who.int/en/>
5. Testing center <https://www.testcentr.org.ua/uk/>
6. Ministry of Health of Ukraine <https://moz.gov.ua/>
7. Center for Public Health of the Ministry of Health of Ukraine <https://phc.org.ua/kontrol-zakhvoryuvan>
8. International Journal of Pharmaceutical and Healthcare Marketing: <https://www.emerald.com/journals>

The syllabus of the discipline «Pharmaceutical Logistics: the way of the drug from producer to consumer» was discussed and approved at the meeting of the department Department of Pharmacy (record № 1, dated August "26" 2025)

Responsible for the academic discipline
(signature)



Hanna KRAMAR

The Head of the Pharmacy Department
(signature)



Olena KRYVOVIAZ