

**National Pirogov Memorial Medical University, Vinnytsia**

**"APPROVE"**

Acting rector of higher education institution

*[Signature]*  
Viktorii PETRUSHENKO

" 31 " 08 2023 year

**«AGREED»**

Head of the Department of Pharmacy

*[Signature]* Olena KRYVOVIAZ

" 31 " 08 2023 year

**SYLLABUS**  
of academic discipline

**EC 40 PHARMACEUTICAL LOGISTICS: THE WAY OF THE DRUG FROM  
PRODUCER TO CONSUMER**

Specialty	226 Pharmacy, Industrial Pharmacy
Educational level	the second (master`s) level
Educational programme	<i>EPP «Pharmacy», 2022</i>
Academic year	2023-2024
Department	Pharmacy
Lecturer (if lectures are given)	Prof. of HEI Olena KRYVOVIAZ, Ass. Prof. of HEI Yulia TOMASHEVSKA, PhD, Ass. Prof. Hanna KRAMAR
Contact information	<i>pharmacy@vnmu.edu.ua</i>
Syllabus compiler	PhD, 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 (V 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". 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):*

GC 2. Ability to apply knowledge in practical situations.

GC 4. Ability to think abstractly, analyze and synthesize, learn and be modernly trained.

GC 6. Knowledge and understanding of the subject area and understanding of the profession.

GC 9. Skills in the use of information and communication technologies.

GC 10. Ability to choose a communication strategy, ability to work in a team and with experts from other fields of knowledge / types of economic activity.

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

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

PC 7. Ability to ensure proper storage of medicines and other pharmacy products in accordance with their physical and chemical properties and the rules of Good Storage Practice (GSP) in health care facilities.

PC 9. Ability to analyze and forecast the main economic indicators of pharmacy institutions, to calculate the main taxes and fees, to formulate prices for medicines and medical devices in accordance with the current legislation of Ukraine.

PC 10. Ability to develop, implement and apply management approaches in the professional activities of pharmacies, wholesale and intermediary, manufacturing enterprises and other pharmaceutical organizations, to argue the principles of HR management and self-management, to demonstrate leadership skills.

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

PC 17. Ability to organize and carry out general and marketing management of assortment, product innovation, pricing, sales and communication policies of pharmaceutical market participants based on the results of market research and taking into account market processes in the national and international markets, to manage risks in the pharmaceutical supply system.

PC 19. Ability to organize and carry out quality control of medicinal products in accordance with the requirements of the current State Pharmacopoeia of Ukraine and good practices in pharmacy, determine methods of sampling for the control of medicinal products and carry out their standardization in accordance with applicable requirements, prevent the distribution of counterfeit medicinal products.

- *Program learning outcomes for the discipline:*

PLO 2. Apply knowledge of general and special disciplines in professional activities.

PLO 3. To comply with the norms of sanitary and hygienic regime and safety requirements in the performance of professional activities.

PLO 4. Demonstrate the ability to independently search, analyze and synthesize information from various sources and use these results to solve typical and complex specialized tasks of professional activity.

PLO 7. Perform professional activities using creative methods and approaches.

PLO 8. Carry out professional communication in the state language, use oral communication skills in a foreign language, analyze professional texts and translate foreign language information sources.

PLO 9. To carry out professional activities using information technology, "Information databases", navigation systems, Internet resources, software and other information and communication technologies.

PLO 12. Analyze information obtained from scientific research, summarize, systematize and use it in professional activities.

PLO 14. Identify the advantages and disadvantages of medicines of different pharmacological groups, taking into account their chemical, physicochemical, biopharmaceutical, pharmacokinetic and pharmacodynamic characteristics. To recommend to consumers over-the-counter medicines and other products of pharmacy assortment with the provision of advisory assistance and pharmaceutical care.

PLO 16. Determine the influence of factors that affect the processes of absorption, distribution, deposition, metabolism and excretion of drugs and are caused by the state, characteristics of the human body and physicochemical properties of drugs.

PLO 17. Use data from clinical, laboratory and instrumental studies to monitor the efficacy and safety of medicines.

PLO 26. Choose a rational technology, manufacture medicinal products in various dosage forms according to prescriptions and orders of medical institutions, and prepare them for release. Perform technological operations: weigh, measure, dose various medicines by weight, volume, etc. Develop and draw up technological documentation for the manufacture of medicines in pharmacies.

### 3. Content and logistics of the discipline

Module 1: «Pharmaceutical Logistics: the way of the drug from producer to consumer»	3 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 / 3 course / Educational materials / or through the link <https://www.vnmdu.edu.ua/кафедра-фармації#>.. Access to the materials is carried out through the student's corporate account [s000XXX@vnmdu.edu.ua](mailto:s000XXX@vnmdu.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 <a href="https://www.vnmdu.edu.ua/General">https://www.vnmdu.edu.ua/General</a> 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.vnmdu.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
<b>180-200</b>	<b>A</b>	excellent	credited
<b>170-179,99</b>	<b>B</b>	good	
<b>160-169,99</b>	<b>C</b>		
<b>141-159,99</b>	<b>D</b>	satisfactory	
<b>122-140,99</b>	<b>E</b>	satisfactory	
<b>0-121,99</b>	<b>FX</b>	unsatisfactory with the possibility of reassembly	is not credited with the possibility of reassembling
	<b>F</b>	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.vnmue.edu.ua/General> information).

#### **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. 505 of 30.08.2023).

**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.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.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 6 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).

The syllabus of the discipline «Pharmaceutical Logistics: the way of the drug from producer to consumer» discussed and approved at the meeting of the Department of Pharmacy (record № 1, dated "29" August 2023)

Responsible for the academic discipline  
(signature)



PhD, Ass. Prof. of HEI Hanna KRAMAR

The Head of the Pharmacy Department  
(signature)



Prof. of HEI Olena KRYVOVIAZ