

NATIONAL PIROGOV MEMORIAL MEDICAL UNIVERSITY, VINNYTSIA



COURSE SYLLABUS

Academic discipline for Master's degree training: **TECHNOLOGY OF DRUG: PHARMACY COMPOUNDING**

Specialty	226 Pharmacy, Industrial Pharmacy
Educational Programme	EPP “Pharmacy” (2023)
Higher Education Level	Second (Master's) level
Academic Year	2026–2027
Status of the Discipline	Mandatory
Language of Instruction	Ukrainian, English
Total Workload	7.0 ECTS credits
Year of Study / Semester	III / 6–7 (full-time) IV–V / 9–10 (extramural studies)
Developer	H. Kramar, Associate Professor, Candidate of Pharmaceutical Sciences
Instructor(s)	O. Kryvoviaz, Professor, Doctor of Pharmaceutical Sciences; Yu. Tomashevskaya, Associate Professor, Candidate of Pharmaceutical Sciences; O. Toziuk, Associate Professor, Candidate of Pharmaceutical Sciences; H. Kramar, Associate Professor, Candidate of Pharmaceutical Sciences
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1. DESCRIPTION OF THE ACADEMIC DISCIPLINE

ABSTRACT

Brief course overview and relevance (What is studied? What knowledge will the student acquire?)

The academic discipline «Technology of drug: pharmacy compounding» belongs to the professional training component for Specialty 226 Pharmacy, Industrial Pharmacy, Specialisation 226.01 Pharmacy.

The subject of the discipline comprises the fundamental principles and development trends of pharmaceutical technology worldwide and in Ukraine; acquisition of current principles of regulatory documentation and technologies for manufacturing pharmaceutical products in various dosage forms using new groups of excipients and modern equipment in pharmacy settings.

Together with other pharmaceutical disciplines and social sciences, Drug Technology plays an important role in shaping the professional outlook of pharmacy specialists and providing them with specialised technological training for professional practice aimed at supplying medicines to the public and healthcare institutions. The discipline also develops practical skills related to the main stages in the formation and development of the pharmaceutical sector and professional practice in Ukraine and abroad, as well as general requirements for the preparation of medicinal products.

Prerequisites (Which disciplines provide the knowledge required for successful completion of this course?)

The discipline builds on physics and chemistry studied during secondary education and requires prior knowledge from the following curriculum disciplines:

- General and Inorganic Chemistry (physical and chemical properties of compounds, structure of matter, states of aggregation, solutions, concentration, etc.);
- Physical and Colloid Chemistry (basic chemical thermodynamics and surface chemistry; structure and organisation of macromolecules; structure and properties of colloidal particles);
- Biological Physics with Physical Methods of Analysis (fundamentals of thermodynamics and mechanics, and basic knowledge of solid-state physics and materials science);
- Introduction to Pharmacy (key interdisciplinary relationships in pharmacy and basic concepts of drug technology and biopharmaceutics);
- Biology with Fundamentals of Genetics (cellular structure of living matter, its chemical composition, and differences between plant and animal cells);
- Botany (taxonomy, classification, histological structure and chemical composition of medicinal plants);
- Theoretical Foundations of Dosage Form Technology (classification of technological processes; biopharmaceutical factors affecting medicinal product efficacy; identification of homogeneous and heterogeneous systems; theoretical foundations of comminution and dissolution, stabilisation and dispersion of heterogeneous systems, and extraction).

PURPOSE AND OBJECTIVES

The purpose of the course and its relevance to professional practice are to ensure that students acquire the theoretical foundations and practical skills required to prepare medicinal products in pharmacies in accordance with Good Pharmacy Practice and Good Manufacturing Practice requirements; prepare technological documentation for medicinal product preparation; apply storage and packaging rules; understand the characteristics, classification and range of extemporaneous dosage forms; and develop theoretical knowledge and professional skills by studying the effects of excipients on medicinal product quality, thereby enabling future specialists to realise their scientific and creative potential. Knowledge of the theory and practice of dosage-form preparation is essential for performing professional duties.

Competencies and learning outcomes supported by the discipline

• *Integral competence:*

Ability to solve problems and analyse and address practical research and/or innovation challenges in the field of pharmacy.

• *General competencies:*

- GC 01. Commitment to environmental protection.
- GC 02. Ability to think abstractly, analyse and synthesise.
- GC 03. Knowledge and understanding of the subject area and professional activities.
- GC 04. Ability to adapt and act in new situations; ability to show initiative.
- GC 06. Skills in using information and communication technologies.
- GC 07. Ability to choose communication strategies and work in a team with experts from other fields of knowledge and economic activity.
- GC 08. Ability to evaluate and ensure the quality of work performed.
- GC 09. Ability to conduct research at an appropriate level.
- GC 11. Ability to preserve and enhance society's moral, cultural and scientific values and achievements based on an understanding of the history and patterns of development of the subject area and its place in the system of knowledge about nature and society and in the development of society, engineering and technology; ability to use various forms of physical activity for recreation and a healthy lifestyle.
- *Specific (professional/subject-specific) competencies:*
- PC 01. Ability to collect, interpret and apply data required for professional practice, research and implementation of innovative projects in pharmacy.
- PC 02. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.
- PC 04. Ability to apply Ukrainian regulatory and legislative acts and Good Pharmacy Practice recommendations in professional activities.
- PC 05. Ability to demonstrate and apply communication skills and the fundamental principles of pharmaceutical ethics and deontology in practice, 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 guidance.
- PC 06. Ability to communicate knowledge, conclusions and reasoning in pharmacy clearly and unambiguously to specialists and non-specialists, including learners.
- PC 18. Ability to organise and carry out pharmacy manufacturing activities, preparing medicinal products in various dosage forms according to prescriptions and healthcare institution orders, including justification of the technology and selection of excipients in accordance with Good Pharmacy Practice (GPP).
- PC 22. Ability to organise and conduct quality control of medicinal products in accordance with the current State Pharmacopoeia of Ukraine and Good Pharmacy Practice requirements; determine sampling methods and standardise medicinal products according to applicable requirements; and prevent the distribution of falsified medicines.

Post-requisites (How will this discipline support further study and professional practice?)

This discipline provides a foundation for “Drug Technology: Industrial Drug Technology”, “Technology of Medicinal Cosmetic Products”, elective courses such as “Perfume and Cosmetic Products”, introductory and educational practical training in pharmacy drug technology, industrial practical training in pharmacy drug technology, pharmaceutical biotechnology, and quality systems in pharmacy. Topics concerning the technology of extractive preparations are integrated with Pharmacognosy, while topics on state regulation of medicinal product manufacture are integrated with “Standardisation of Medicinal Products” and the specialisation “Quality Control of Medicinal Products”. Regulatory documentation covered during the course is a prerequisite for “Organisation and Economics in Pharmacy”. Teaching integrates these disciplines and develops the ability to apply knowledge in further study and professional practice.

2. LEARNING OUTCOMES

Programme learning outcomes for this discipline:

- PLO 01. Apply specialised knowledge and skills acquired in general and professional disciplines to professional practice.
- PLO 02. Critically analyse scientific and applied problems in pharmacy.

PLO 03. Evaluate and ensure the quality and effectiveness of activities in pharmacy.

PLO 04. Comply with sanitary and hygiene requirements and occupational safety rules in professional practice.

PLO 05. Plan and carry out professional activities on the basis of Ukrainian legislation and Good Pharmacy Practice recommendations.

PLO 07. Demonstrate the ability to independently search, analyse and synthesise information from various sources, including professional literature, patents and databases; evaluate information, including by statistical analysis; and apply the results to routine and complex specialised professional tasks, including the development and manufacture of medicinal products.

PLO 08. Develop and make effective decisions to solve complex pharmacy problems independently and through joint discussion; set individual and team objectives while considering social and production interests, overall strategy and existing constraints; and identify optimal ways to achieve objectives.

PLO 15. Formulate, justify and communicate information clearly and specifically to specialists and non-specialists, including higher education students, drawing on personal knowledge and professional experience and on major trends in global pharmacy and related fields.

PLO 22. Develop technological documentation for the preparation of medicinal products, select appropriate technologies, prepare products in various dosage forms according to prescriptions and healthcare institution orders, and prepare them for dispensing.

PLO 26. Ensure and conduct quality control of medicinal products of natural and synthetic origin and document the results; prepare quality certificates and certificates of analysis in accordance with the current State Pharmacopoeia of Ukraine, quality control methods, technological instructions, etc.; and take measures to prevent the distribution of substandard, falsified and unregistered medicinal products.

3. FORMS OF ORGANISATION OF THE EDUCATIONAL PROCESS AND THEIR SCOPE

Type of Learning Activity	Hours
Full-time study	
Lectures:	28
Practical classes:	108
Independent study:	74
Total	210
Part-time study	
Lectures:	12
Practical classes:	26
Independent study:	172
Total	210

4. THEMATIC PLAN

Module 1. Technology of Solid and Liquid Non-Sterile Dosage Forms

Thematic module 1. Basic concepts of pharmacy compounding. Powders

Topic 1. Basic concepts of pharmacy compounding. Containers and other materials which are used in pharmacy practice.

Topic 2. State setting of norms of pharmacy compounding.

Topic 3. Dosage in pharmacy compounding.

Topic 4. Compounding of simple and complex powders with the medicinal matters that differ by the prescribed amount and and physical and chemical properties. Compounding of complex powders with volatile matters.

Topic 5. Compounding of complex powders with the poisonous and drastic matters. Triturations.

Topic 6. Compounding of complex powders with dyeing, hard-grinded matters, extracts, liquids and ready-to-cook mixtures. Embarrassing and incompatible prescription of powders.

Topic 7. Species.

Thematic module 2. Liquid homogeneous non-sterile medicinal forms

Topic 8. Compounding of the concentrated solutions for the buret system

Topic 9. Compounding of liquid medical forms by mass-volume method by dissolution of dry medicinal matters and using concentrated solutions.

Topic 10. Special cases of water solutions compounding. Compounding of liquid medical forms by breeding of standard pharmacopoeian liquids.

Topic 11. Compounding of non-aqueous solutions. Drops.

Topic 12. Solutions of high molecular medicines. Colloid solutions.

Topic 13. Suspensions.

Topic 14. Emulsions.

Topic 15. Infusions and decoctions from MPM, which contains strong and not strong effective.

Topic 16. Mucouses. Technology of water extractions with the use of extracts-concentrates. Embarrassing and incompatible prescription of liquid medical forms.

Topic 17. Liniments.

Module 2. Soft dosage forms. Suppositories, pills. Aseptically made dosage forms. Difficult recipes. Pharmaceutical incompatibilities

Thematic module 3. Liniments. Ointments. Suppositories

Topic 1. Homogeneous ointments.
 Topic 2. Suspensive, emulsive and combined ointments. Author, pharmacopoeian, difficult compositions and incompatibilities in semi-solid medicinal forms.

Topic 3. Features of ointment technology.

Topic 4. Compounding of suppositories by rolling method

Topic 5. Compounding of suppositories by casting method.

Topic 6. Features of suppositories technology

Topic 7. Pills

Thematic module 4. Aseptic and sterile dosage forms

Topic 8. Organization of aseptic conditions in pharmacy. Solvents. Sterilization. Features of technology of termolabile and self-sterilizing matters. Suspensions for injections.

Topic 9. Compounding of solutions for injections without stabilizers.

Topic 10. Compounding of solutions for the injections with stabilizers.

Topic 11. Compounding of isotonic solutions and infusion solutions.

Topic 12. Eye medicinal forms.

Topic 13. Medicinal forms with antibiotics.

Topic 14. Medicinal forms for newborns and children under 1 year.

Thematic module 5. Difficult prescriptions. Pharmaceutic incompatibilities

Topic 14. Difficult cases of medicinal forms compounding. Pharmaceutical incompatibilities.

Topic 15. Medicinal preparations of special purpose

5. FORMS AND METHODS OF ASSESSING LEARNING OUTCOMES

Ongoing assessment during practical classes	<u>Methods: oral and/or written questioning and testing, computer-based assessment and testing, and solving situational problems.</u>
Interim assessment of the discipline – pass/fail	Conducted during the final practical class of the semester and determined on the basis of ongoing performance in accordance with the Regulations on the Organisation of the Educational Process at National Pirogov Memorial Medical University, Vinnytsia. https://vnmdu.edu.ua/Загальна_інформація/Основні_документи або https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf https://vnmdu.edu.ua/Загальна_інформація/Основні_документи або https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf
Final assessment – examination	Conducted during the examination session according to the examination schedule and assessed in accordance with the Regulations on the Organisation of the Educational Process at National Pirogov Memorial Medical University, Vinnytsia. https://vnmdu.edu.ua/Загальна_інформація/Основні_документи або https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf https://vnmdu.edu.ua/Загальна_інформація/Основні_документи або https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf
Learning assessment tools	Theoretical questions, tests, clinically oriented situational tasks, practical assignments and demonstration of practical skills.

6. ASSESSMENT CRITERIA

Assessment of knowledge is carried out in accordance with the current Regulations on the Organisation of the Educational Process at National Pirogov Memorial Medical University, Vinnytsia.

[https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)

Ongoing assessment	According to the traditional grading scale: 5 “Excellent”, 4 “Good”, 3 “Satisfactory”, 2 “Unsatisfactory”
Interim assessments	According to the traditional grading scale
Assessment of practical skills	According to the traditional grading scale
Pass/fail assessment	According to the 200-point scale (the arithmetic mean of semester grades is converted into points) Passed: 122–200 points Failed: fewer than 122 points Passed: from 122 to 200 points Not passed: less than 122 points Passed: from 122 to 200 points Not passed: less than 122 points
Final assessment of the discipline	Examination grade: 71–80 points – “Excellent” 61–70 points – “Good” 50–60 points – “Satisfactory” Fewer than 50 points – “Unsatisfactory” / failed 71–80 points – “Excellent” 61–70 points – “Good” 50–60 points – “Satisfactory” Less than 50 points – "unsatisfactory" / failed 71–80 points – "excellent" 61–70 points – "good" 50–60 points – "satisfactory" Less than 50 points – "unsatisfactory" / failed
Overall assessment of the discipline:	Ongoing performance: 72–120 points (conversion of the average traditional grade for practical classes to the 120-point scale), accounting for 60% of the final course grade Final assessment: 50–80 points, accounting for 40% of the final course grade Individual assignment: 1–12 points Total: 122–200 points. Final assessment – from 50 to 80 points: 40% of the course grade Individual work – from 1 to 12 points Total: from 122 to 200 points.

Grading scale: national and ECTS

Total Score for All Learning Activities	ECTS Grade	National Grade: Examination, Course Project (Paper), Practical Training	National Grade: Pass
180–200	A	Excellent	Passed
170–179.99	B	Good	Passed
160–169.99	C	Good	Passed
141–159.99	D	Satisfactory	Passed

Total Score for All Learning Activities	ECTS Grade	National Grade: Examination, Course Project (Paper), Practical Training	National Grade: Pass
122–140.99	E	Satisfactory	Passed
60–121.99	FX	Unsatisfactory, with the possibility of retaking	Failed, with the possibility of retaking
0–59.99	F	Unsatisfactory, with mandatory repetition of the discipline	Failed, with mandatory repetition of the discipline

Criteria for assessing students' knowledge

Assessment of oral/written responses during ongoing assessment

The grade “Excellent” is awarded when a student demonstrates comprehensive knowledge of the topic, illustrating responses with a variety of relevant examples; provides complete, accurate, and clear answers without prompting or leading questions; presents the material without errors or inaccuracies; confidently solves problems and completes practical tasks of varying levels of complexity; and independently generates innovative ideas.

The grade “Good” is awarded when a student demonstrates good knowledge and understanding of the topic and provides correct, coherent, and well-structured answers, although they may not be fully comprehensive. The student answers additional questions correctly and without significant errors; successfully solves problems and completes practical tasks, experiencing difficulties only with the most complex assignments.

The grade “Satisfactory” is awarded when a student demonstrates knowledge of the overall content of the topic and a satisfactory level of understanding. With the help of guiding questions, the student is able to solve modified (simplified) problems; solves problems and completes practical tasks, although experiencing difficulties even with relatively simple assignments; is unable to formulate a coherent and systematic response independently but provides correct answers to direct questions.

The grade “Unsatisfactory” is awarded when a student's knowledge and skills do not meet the requirements for the grade “Satisfactory”.

Assessment criteria for all other types of student work are based on the Regulations on the Organisation of the Educational Process at National Pirogov Memorial Medical University, Vinnytsia, and are specified in the course programme. [https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)

Assessment of independent study

Independent study assigned alongside classroom work is assessed as part of the ongoing assessment of the relevant topic during the corresponding practical class.

The maximum score a student can receive for the discipline is 200 points. The minimum score is 122 points.

7. METHODOLOGICAL SUPPORT

Teaching and learning materials (lecture notes or expanded lecture outlines), thematic plans for lectures, practical classes and independent study, ongoing assessment assignments, methodological guidelines and manuals.

8. ACADEMIC DISCIPLINE POLICIES

All learning tasks and work within the discipline must comply with the Regulations on the Organisation of the Educational Process at National Pirogov Memorial Medical University, Vinnytsia; the Regulations on the Organisation of the Educational Process for PhD students at the University; the Law of Ukraine “On Education” (Article 42); the Law of Ukraine “On Academic Integrity”; and the University Code of Academic Integrity. [https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf) https://www.vnmu.edu.ua/downloads/other/pologPhD_org.pdf https://www.vnmu.edu.ua/downloads/other/kod_ex_akad_dobr_edit%202026.pdf

Students are entitled to high-quality educational services and a safe learning environment during martial law, emergencies and states of emergency; access to current scientific and educational information; and qualified advice while studying the discipline and acquiring practical skills. The Department's student-centred policy is based on regulatory documents of Ukraine's Ministry of Education and Science and Ministry of Health, the University Statute, procedures governing educational services, relevant emergency procedures and academic integrity principles.

Academic integrity. When studying the discipline and completing learning assignments and/or research activities, students must comply with the Law of Ukraine "On Education" (Article 42), the Law of Ukraine "On Academic Integrity" and the University Code of Academic Integrity. Violations are addressed in accordance with applicable regulations. <https://www.vnmu.edu.ua/>

Compliance with University regulations and safety rules during practical classes. At the first practical class, the instructor briefs students on safe conduct in the Department, identifies the shelter and evacuation route, explains conduct while moving to and staying in the shelter, and describes actions under the Emergency Response Plan (Order No. 505 of 30 August 2023). In the event of an air-raid alert or another warning signal, the instructor suspends the class and everyone proceeds to the shelter until the signal is cancelled. Afterwards, classes resume in the Department's classrooms or students independently complete the remaining material, which is reviewed at the next class.

Requirements for preparation for practical classes

Students must participate actively in the educational process: attend classes prepared; complete the current-topic test assignments in their workbooks and fill in diagrams and tables; actively discuss the topic; complete all assignments required by the programme; seek additional information on the topic and present it to their peers.

Students must arrive on time. Lateness is not permitted under the University's Internal Regulations. Students arriving more than 10 minutes late are not admitted to the class and must make it up according to the established procedure.

Students must be polite, friendly and respectful towards instructors, staff, fellow students and others at the University. They must maintain quiet and orderly conduct on Department premises.

The Department staff follow the principles of mutual respect and tolerance, and students are expected to do the same.

Students must comply with safety rules while on Department premises.

In teaching and research laboratories, students must follow the safety rules published on the Department of Pharmacy website. Workstations must be kept orderly during practical tasks and cleaned after the work is completed.

Use of mobile phones and other electronic devices. Mobile phones and other electronic devices may not be used during classes except for emergency calls or to demonstrate supplementary material relevant to the class topic.

Missed classes. Missed classes must be made up in accordance with the current University Regulations on the Organisation of the Educational Process at the time specified in the make-up schedule published on the Department of Pharmacy website, with the instructor on duty or the student's regular instructor. Make-up work includes completing assignments on the missed topic in accordance with the requirements of the discipline. [https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)<https://www.vnmu.edu.ua/>

Lecture topics are assessed during practical classes, seminars (including assessment of practical skills) and final assessment in accordance with the University Regulations on the Organisation of the Educational Process. [https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)

Admission to final assessment is governed by the current University Regulations. Students are admitted if they have no outstanding academic requirements: the average ongoing grade must be at least 3.0 (72 points on the 120-point scale); all content-module final classes must be passed with a grade of 3 or higher; and all missed practical classes must be made up with a grade of 3 or higher. Otherwise, students must improve unsatisfactory grades and make up all missed

classes. [https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)

Additional points for individual assignments. Students may receive additional points for completing individual work to a high standard. Assignment details are published on the Department website among the course teaching materials. Points are awarded in accordance with the current University

Regulations. [https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc\(2026\).pdf](https://www.vnmdu.edu.ua/downloads/other/polog_organiz_ocv_proc(2026).pdf)

Resolution of Conflict Situations

In the event of misunderstandings or concerns regarding the quality of educational services, assessment of academic performance, or other conflict situations involving an instructor, students should first raise their concerns directly with the instructor. If the issue remains unresolved, the student has the right to submit an appeal to the Head of the Department in accordance with the Regulations on the Consideration of Appeals from Higher Education Students at National Pirogov Memorial Medical University, Vinnytsya ([VNMU website → General Information → Key Documents](#)).

Students also have the right to contact the student self-government bodies, the administration of the Faculty (Institute), or the University administration, either directly or through the designated feedback channels (“trust boxes”), links and addresses for which are available on the official VNMU website.

The Department recognises that a student-centred approach entails students’ responsibility for the conscious and active acquisition of knowledge and for proper compliance with the rules and requirements established by applicable legislation and VNMU regulatory documents. The Department reserves the right to inform the relevant University bodies of any violations committed by students.

Policy on Blended Learning

The organisation of blended learning is governed by the Regulations on the Introduction of Elements of Distance Learning at National Pirogov Memorial Medical University, Vinnytsya ([VNMU website → General Information → Key Documents](#)). The main online learning platforms used for classes are Microsoft Teams and Google Meet.

The procedures for conducting practical classes, lectures, make-up classes, and consultations in the distance learning format are published on the Department’s webpage ([VNMU website → Pharmacy Department → For Students/Postgraduate Students → Mode of Study → Year of Study → Teaching and Learning Materials](#)).

Communication with the Instructor. Students may contact the instructor via Microsoft Teams chat, messaging applications (Viber, Telegram, WhatsApp), or email, as determined by the instructor, during working hours.

9. LEARNING RESOURCES

Teaching and learning materials for the discipline are available on the Department’s website. The materials can be accessed via: [VNMU website → \[Pharmacy Department\] → For Students/Postgraduate Students](#).

LITERATURE

Core literature

1. Tikhonov O. I., Yarnykh T. H. Pharmacy Drug Technology: textbook for students of pharmacy faculties of higher medical educational institutions of Ukraine, accreditation levels III–IV. 5th ed. Vinnytsia: Nova Knyha, 2019. 536 p., ill.
2. Drug Technology: Pharmacy Drug Technology. Part 1: Technology of Solid and Liquid Non-Sterile Dosage Forms. Teaching manual for students of the Faculty of Pharmacy (Specialty “Pharmacy, Industrial Pharmacy”). Kryvoviazh O. V., Tomashevskaya Yu. O., Toziuk O. Yu., Voronkina A. S., Kramar H. I., Kudria V. V. Vinnytsia, 2024. Approved by the Academic Council of National Pirogov Memorial Medical University and recommended for publication (Minutes No. 9, 25 April 2024). 209 p. Available at: <https://cutt.ly/KeXcLMWc>
3. Drug Technology: Pharmacy Drug Technology. Part 2: Semi-Solid Dosage Forms. Suppositories. Aseptically Prepared Dosage Forms. Difficult Prescriptions. Pharmaceutical Incompatibilities. Teaching manual for students of the Faculty of Pharmacy (Specialty “Pharmacy,

Industrial Pharmacy”). Kryvoviazh O. V., Tomashevska Yu. O., Toziuk O. Yu., Voronkina A. S., Kramar H. I., Kudria V. V. Vinnytsia, 2024. Approved by the Academic Council of National Pirogov Memorial Medical University and recommended for publication (Minutes No. 9, 25 April 2024). 176 p. Available at: <https://cutt.ly/BeXcKTvA>
<https://cutt.ly/BeXcKTvA>

4. Drug Technology: teaching and methodological manual. Mazulin O. V., Ostapenko A. O., Shpychak O. S. et al. 3rd revised edition. Lviv: Publisher Marchenko T. V., 2024. 428 p.

5. Law of Ukraine “On Medicinal Products” dated 23 August 2023. Available at: <https://zakon.rada.gov.ua/laws/show/2469-20#Text>
<https://zakon.rada.gov.ua/laws/show/2469-20#Text>

6. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 5. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2021. 424 p.

7. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 6. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2023. 416 p.

8. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 7, Vol. 1. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2024. 424 p.

9. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 7, Vol. 2. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2024. 424 p.

10. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 8. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2025. 452 p.

11. Order of the Ministry of Health of Ukraine No. 360 of 19 July 2006 “On Approval of the Rules for Prescribing Medicinal Products, the Procedure for Dispensing Medicinal Products from Pharmacies and Their Structural Units, and the Instructions for Storage, Recording and Destruction of Prescription Forms”.

12. Order of the Ministry of Health of Ukraine No. 1099 of 10 August 2025 “On Approval of State Sanitary Rules and Regulations: Sanitary and Anti-Epidemic Requirements for Pharmacy Establishments”. Available at: <https://zakon.rada.gov.ua/laws/show/z1233-25#Text>
<https://zakon.rada.gov.ua/laws/show/z1233-25#Text>

13. Order of the Ministry of Health of Ukraine No. 812 of 17 October 2012 “On Approval of the Rules for the Manufacture (Preparation) of Medicinal Products in Pharmacy Settings”. Available at: <http://zakon1.rada.gov.ua/laws/show/z1606-04>
<http://zakon1.rada.gov.ua/laws/show/z1606-04>

14. Standard guideline “Requirements for the Preparation of Non-Sterile Medicinal Products in Pharmacy Settings. ST-N MoH of Ukraine 42-4.5:2015”. Available at: http://www.moz.gov.ua/ua/portal/dn_20150701_0398.html
http://www.moz.gov.ua/ua/portal/dn_20150701_0398.html

15. Standard guideline “Requirements for the Preparation of Sterile Medicinal Products in Pharmacy Settings. ST-N MoH of Ukraine 42-4.6:2015”. Available at: http://www.moz.gov.ua/ua/portal/dn_20150701_0398.html
http://www.moz.gov.ua/ua/portal/dn_20150701_0398.html

Supplementary literature

1. State Pharmacopoeia of Ukraine. 1st ed. Kharkiv: RIREH, 2001. 556 p.
2. State Pharmacopoeia of Ukraine. 1st ed., Supplement 1. Kharkiv: RIREH, 2004. 494 p.
3. State Pharmacopoeia of Ukraine. 1st ed., Supplement 2. Kharkiv: RIREH, 2008. 620 p.
4. State Pharmacopoeia of Ukraine. 1st ed., Supplement 3. Kharkiv: RIREH, 2010. 279 p.
5. State Pharmacopoeia of Ukraine. 1st ed., Supplement 4. Kharkiv: RIREH, 2011. 538 p.
6. State Pharmacopoeia of Ukraine. 2nd ed., Vol. 1. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2015. 1128 p.
7. State Pharmacopoeia of Ukraine. 2nd ed., Vol. 2. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2014. 724 p.
8. State Pharmacopoeia of Ukraine. 2nd ed., Vol. 3. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2015. 732 p.
9. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 1. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2016. 360 p.

10. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 2. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2018. 336 p.
11. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 3. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2018. 416 p.
12. State Pharmacopoeia of Ukraine. 2nd ed., Supplement 4. Kharkiv: Ukrainian Scientific Pharmacopoeial Centre for Quality of Medicines, 2020. 600 p.

ELECTRONIC RESOURCES

1. University website: <http://vnmuedu.ua>
2. University Library website: <http://library.vnmuedu.ua><http://library.vnmuedu.ua>
3. Department of Pharmacy, National Pirogov Memorial Medical University: <http://www.vnmuedu.ua>
4. World Health Organization: <http://www.who.int/en/>
5. Testing Centre of the Ministry of Health of Ukraine: <https://www.testcentr.org.ua/uk/><https://www.testcentr.org.ua/uk/>
6. Ministry of Health of Ukraine: <https://moz.gov.ua/><https://moz.gov.ua/>
7. Public Health Center of the Ministry of Health of Ukraine: <https://phc.org.ua/kontrol-zakhvoryuvan><https://phc.org.ua/kontrol-zakhvoryuvan>
8. Official web portal of the Verkhovna Rada of Ukraine: <https://www.rada.gov.ua/><https://www.rada.gov.ua/>
9. State Service of Ukraine on Medicines and Drugs Control: <https://www.dls.gov.ua/><https://www.dls.gov.ua/>

The syllabus for «Technology of drug: pharmacy compounding» was discussed and approved at a meeting of the Department of Pharmacy (Minutes No. 1, dated 26 August 2026).

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