

# National Pirogov Memorial Medical University, Vinnytsia

"APPROVE"

Higher Educational Institution  
Vice-Rector for Scientific and  
Academic Work and International Links  
Inna ANDRUSHKO

"30" August 2024 year

«AGREED»

Head of the Department of Pharmacy  
Olena KRYVOVIAZ

"30" August 2024 year

## SYLLABUS of academic discipline

### «PHARMACEUTICAL TERMINOLOGY AND BASICS OF PHARMACEUTICAL CALCULATIONS»

|                                  |   |
|----------------------------------|---|
| 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                    | 2024-2025   |
| Department                       | Pharmacy  |
| Lecturer (if lectures are given) | Prof. of HEI Olena KRYVOVIAZ, Ass. Prof. of HEI Yulia TOMASHIVSKA, PhD, Ass. Prof. Hanna KRAMAR |
| Contact information              | <i>pharmacy@ynmu.edu.ua</i>   |
| Syllabus compiler                | Ass. Prof. of HEI Hanna KRAMAR  |

### Status and structure of the discipline

|  |  |
|--|--|
| Discipline status  | Elective course  |
| Discipline code in EPP/ discipline place in EPP                              | EC 8// discipline of professional training   |
| Course / semester  | 1 course (II semester)   |
| Scope of the discipline (the total number of hours / number of credits ECTS) | 90 hours /3 credits ECTS   |
| Number of content modules  | 1 module   |
| The structure of the discipline  | Lectures - 10 hours<br>Practical classes 30 hours<br>Extracurricular work 50 hours |
| Language   | English  |
| Form of study  | Full-time ( <i>or remote according to the order</i> )                              |

#### 1. Description of the course

##### **Brief annotation, actuality.**

Elective course «Pharmaceutical terminology and basics of pharmaceutical calculations» belongs to the cycle of disciplines of professionally-oriented training of specialists in the specialty 226 «Pharmacy, industrial pharmacy». The discipline lays the foundations of modern pharmaceutical terminology and forms the concept of basic pharmaceutical calculations of dosage form technology. Acts as a link between the theoretical disciplines that form the profile of the Master of Pharmacy.

**The subject** of the elective course is pharmaceutical terminology and basic pharmaceutical calculations of dosage form technology.

Integrative final program learning outcomes, the formation of which is facilitated by this elective course:

##### ***know:***

- Basic terms used in pharmacy
- Classification of LF
- Input routes
- Higher single and daily doses of toxic, narcotic, intoxicating, potent substances.
- Measures of weight in pharmacy

##### ***be able:***

- Check and, if necessary, correct single and daily doses of drugs A and B, the rules of release of narcotic drugs and similar substances.
- Calculate the number of components of the prescription, the total volume, or weight of the drug, write a passport of written control.
- Use professional knowledge to solve practical situations.

##### **Prerequisites**

The discipline is based on the study of basic terms and pharmaceutical calculations, and also uses as prerequisites such disciplines of the curriculum as admission to pharmacy, higher mathematics.

**The purpose** of the course and its importance for professional activity. The purpose of teaching the discipline is to deepen professional knowledge and study of basic pharmaceutical

terms, their systematization and interrelation; mastering pharmaceutical calculations that are the basis for the manufacture of quality medicines.

### **Postrequisites**

The discipline is the basis for the study of disciplines: drug technology: ATL, drug technology: PTL, pharmacology, which involves the integration of teaching with the above disciplines and the formation of skills to apply knowledge in further learning and professional activities.

## **2. Learning outcomes.**

Competencies and learning outcomes that the discipline contributes to:

*Integral competence (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 basic, chemical, technological, biomedical and socio-economic sciences; integrate knowledge and solve complex issues, formulate judgments on insufficient or limited information; clearly and unambiguously convey their own knowledge, conclusions and their validity to the professional and non-professional audience.

*General competencies (GC):*

GC 02. Ability to think abstractly, analyse and synthesise.

GC 03. Knowledge and understanding of the subject area and understanding of professional activities.

GC 06. Skills in the use of information and communication technologies.

GC 07. 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 08. 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 02. Ability to integrate knowledge and solve complex problems of pharmacy in broad or multidisciplinary contexts.

PC 04. Ability to ensure the rational use of prescription and non-prescription drugs and other pharmacy products in accordance with the physicochemical, pharmacological characteristics, biochemical, pathophysiological characteristics of a particular disease and pharmacotherapeutic regimens for its treatment.

PC 06. Ability to clearly and unambiguously communicate own knowledge, conclusions and arguments in the field of pharmacy to specialists and non-specialists, including students.

*Program learning outcomes for the discipline:*

PLO 01. Apply specialized knowledge and skills in general and special disciplines in professional activities.

PLO 02. Critically comprehend scientific and applied problems in the field of pharmacy.

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

PLO 05. Plan and implement professional activities on the basis of regulatory legal acts of Ukraine and recommendations of good pharmaceutical practices.

PLO 07. Demonstrate the ability to independently search, analyze and synthesize information from various sources, including professional literature, patents, databases; evaluate it, in particular, using statistical analysis, as well as apply these results to solve typical and complex specialized tasks of professional activity, including the development and production of medicines.

PLO 08. Develop and make effective decisions on solving complex/complex problems of pharmacy personally and based on the results of joint discussion; formulate goals of own and team activities, taking into account social and industrial interests, general strategy and existing limitations, determine the best ways to achieve goals.

### 3. Content and logistics of the discipline

|   |   |  |
|---|---|--|
| <b>Module 1</b><br>«Pharmaceutical terminology and basics of pharmaceutical calculations» | II semester<br>90 hours /3 credits ECTS | Lectures №5<br>Practical classes №15<br>Extracurricular work №15 |
|---|---|--|

The course includes 10 topics, which are divided into 1 thematic module.

#### **Module 1 «Pharmaceutical terminology and basics of pharmaceutical calculations»**

**Topic 1.** Basic pharmaceutical terminology

**Topic 2.** Rights and obligations of pharmaceutical workers. Qualification requirements

**Topic 3.** Basic terms and concepts of biologically active substances

**Topic 4.** Connection between pharmaceutical terms in drug technology. Classifications of MF.

**Topic 5.** Ways of introduction.

**Topic 6.** Measures of weight in pharmacy.

**Topic 7.** Prescription. The concept of doses. Checking of doses in extemporaneous drugs.

**Topic 8.** Calculations in solid dosage forms

**Topic 9.** Calculations in semi-solid dosage forms

**Topic 10.** Calculations in liquid non-sterile dosage forms: non-aqueous solutions, drops, heterogeneous and combined liquid MF

**Topic 11.** Calculations in sterile and aseptic dosage forms

**Topic 12.** Basic terms of homeopathic medicines

**Topic 13.** Calculations in homeopathic dosage forms. Dilution

**Topic 14.** Veterinary dosage forms. Terminology, calculations.

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

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

- 1) Check and, if necessary, correct single and daily doses of drugs A and B
- 2) Check the rules for the release of narcotic drugs and substances equated to them.
- 3) Calculate the number of components of the recipe
- 4) Calculate the total volume or weight of the drug
- 5) Calculate the amount of excipients (fillers, molding agents, stabilizers, emulsifiers, preservatives, isotonic ingredients)
- 6) Carry out calculations in solid MF
- 7) Carry out calculations in liquid MF
- 8) Carry out calculations in soft MF
- 9) Carry out calculations in sterile and aseptic MF
- 10) Carry out calculations taking into account various coefficients and corrections (CWI, cost coefficient, substitution coefficient, water absorption coefficient, substitution coefficient, isotonic coefficients)
- 11) Calculate the tolerances in different MF

The student's independent work involves preparation for practical classes and intermediate tests, studying topics for independent extracurricular work, writing essays, preparing presentations, tables. The control of mastering the topics of independent extracurricular work is carried out at the intermediate control classes and the final control of the discipline.

Individual work includes the study of scientific literature, preparation of reviews of topics for presentation at meetings of the student scientific group, the implementation of scientific and practical research, participation in specialized competitions, scientific and practical conferences, competitions of student research papers.

Thematic plans of lectures, calendar plans of practical classes, thematic plan of independent extracurricular work, the 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.vnmua.edu.ua/кафедра-фармації#>.. Access to the materials is carried out through the student's corporate account [s000XXX@vnmua.edu.ua](mailto:s000XXX@vnmua.edu.ua).

#### 4. Forms and methods of monitoring academic performance

|  |  |
|--|--|
| Current control in practical studies     | Methods: <i>oral or written questioning, testing, electronic questioning, solving situational tasks</i>  |
| Final control of the discipline (credit) | Methods: <i>oral questioning</i> (according to the Regulation of the Academic process in VNMU named after M.I. Pirogov (link <a href="https://www.vnmua.edu.ua/General">https://www.vnmua.edu.ua/General</a> information)) |
| Learning success diagnostic tools        | Theoretical questions, tests, clinically-oriented situational tasks, practical tasks   |

#### 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.vnmua.edu.ua/General> information)

|                                |  |
|--------------------------------|--|
| Continuous assessment          | On a 5-point system of traditional assessments: 5 «excellent», 4 «good», 3 «satisfactory», 2 «unsatisfactory»  |
| Midpoint separation assessment | On a 5-point system of traditional assessments   |
| Pass-fail exam                 | On a 200-point scale (the arithmetic average grade for the semester is converted into points)<br>Credited: 122 to 200 points<br>Not credited: less than 122 points (See Grading Scale) |

#### Discipline assessment 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 is recorded in the Safety Briefing Log. A higher education 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 should come to class on time, without delay. 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 made up in accordance with the procedure established in the Regulations on the organization of the educational process at the Pirogov National Medical University at the time specified in the schedule of work published on the website <https://drive.google.com/drive/folders/1N8rpQuQ-y0McGMHt1pM3KKjOnpX1ECI>

**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.vnmue.edu.ua/General> information). 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.

## **7. Educational resources.**

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

**9. Questions to the intermediate and final semester control (credit)** of the discipline are published on the web page of the department ([Department of Pharmacy #](https://www.vnmue.edu.ua/Department%20of%20Pharmacy%20#) / for students).

### **The list of literature recommended for studying subjects:**

1. European Pharmacopoeia, 10th Edition 2020, English
2. The International Pharmacopoeia / – [8-th ed.]. – Geneva : World Health Organization, 2019. – 2532 p. – ISBN: 9241545364.
3. British pharmacopoeia. London: Medicines and Healthcare products Regulatory Agency; 2018.
4. The United States pharmacopeia. National formulary. Rockville (MD): United States Pharmacopeial Convention; 2017.
5. The USP Pharmacists' Pharmacopoeia. – Second edition.– 2008. - P. 1114.
6. EudraLex: The Rules Governing Medicinal Products in the European Union. Volume 4: Good Manufacturing Practice / European commission: 22 November 2017. Access: [https://ec.europa.eu/health/system/files/2017-11/2017\\_11\\_22\\_guidelines\\_gmp\\_for\\_atmps\\_0.pdf](https://ec.europa.eu/health/system/files/2017-11/2017_11_22_guidelines_gmp_for_atmps_0.pdf)
7. Pharmacy – based technology of drugs: the manual for applicants of higher education / O.I.Tykhonov, O.A. Yarnykh, O.A. Rukhmakova, G.B. Yuryeva: Edited by O.I. Tykhonov and T.G. Yarnykh. – Kharkiv:NUPh:Golden Pages, 2019. – 488 p.
1. Remington: The Science and Practice of Pharmacy, Twenty Third Edition/ Remington J. P. – Academic press: An imprint of Elsevier, 2020. – 1000 p. <https://doi.org/10.1016/C2018-0-04991-9>
2. Encyclopedia of Pharmaceutical Science and Technology, Fourth Edition, Six Volume Set (Print)/ James Swarbrick Taylor & Francis, 2013 4296 p.
3. Voigt's Pharmaceutical Technology Alfred Fahr, Gerrit L. Scherphof (Translator), Wiley, 2018. 888p.
4. Pharmaceutical Technology: A Practical Manual / Sushma Talegaonkar. - PharmaMed Press, 2019, 232 p.
5. Essentials of Pharmaceutical Technology/ Ajay Semalty, Mona Semalty, M. S. M Rawat. - PharmaMed Press, 2019.364 p. ISBN 9385433172
6. Handbook of Pharmaceutical Technology L. K. Ghosh CBS Publishers & Distributors, 2018 283 стр.ISBN 8123908504
7. Rees J. A. Introduction to pharmaceutical calculations / Judith A Rees; Ian Smith; Jennie Watson – [4-th edition]. – London and Chicago : Pharmaceutical Press, 2016., 290 p. – ISBN: 9780857112439.



### 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>

The syllabus of the discipline "Pharmaceutical terminology and basics of pharmaceutical calculations" was discussed and approved at the meeting of the department Department of Pharmacy

(record № 1, dated August "30" 2024)

Responsible for the academic discipline  
(signature)



Hanna KRAMAR

The Head of the Pharmacy Department  
(signature)



Olena KRYVOVIAZ