

**A syllabus of the discipline  
Pharmacy-based technology of drugs (full-time education)**

**Teachers**



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**1. Name of higher education institution and department:** National University of Pharmacy, Drug Technology Department.

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**3. Web site:** <http://tl.nuph.edu.ua/informaciya-dlya-studentiv>

**4. Information about Teaching Staff:**

***Yarnykh Tetiana Hryhorivna***

Doctor of Pharmaceutical Sciences, Professor, Head of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity - 34 years, experience of scientific and pedagogical activity - 33 years. Teaches disciplines: “Pharmacy-based technology of drugs”, “Technology of drugs (ATL)”, “Biopharmacy”, “Methodology and methods of scientific analysis”, “Modern pharmaceutical development”, “Modeling of scientific research”. Research interests: pharmacy, drug technology, extemporaneous formulation.

***Rukhmakova Olga Anatoliivna***

Doctor of Pharmaceutical Sciences, Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 14 years, experience of scientific and pedagogical activity – 12 years. Reads courses: “Pharmacy-based technology of drugs”, “Biopharmacy”, “Medicines for special purposes”, “Modeling of scientific research”. Research interests: drug technology.

***Buryak Maryna Valeriivna***

PhD (Pharmaceutical Sciences), Associate Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 14 years, experience of scientific and pedagogical activity – 11 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Modeling of scientific research”. Research interests: drug technology.

***Herasymova Iryna Viktorivna***

PhD (Pharmaceutical Sciences), Associate Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 12 years, experience of scientific and pedagogical activity – 8 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Methodology and methods of scientific research”, “Methodology and methods of scientific analysis”, “Medicines for special purposes”, “Modeling of scientific research”. Research interests: drug technology.

***Yuryeva Hanna Borysivna***

PhD (Pharmaceutical Sciences), Associate Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 20 years, experience of scientific and pedagogical activity – 18 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Modeling of scientific research”. Research interests: drug technology.

**Kovalyov Volodymyr Viktorovych**

PhD (Pharmaceutical Sciences), Associate Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 14 years, experience of scientific and pedagogical activity – 10 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Methodology and methods of scientific research”, “Methodology and methods of scientific analysis”, “Modeling of scientific research”. Research interests: drug technology.

**Levachkova Yulia Valentynivna**

Doctor of Pharmaceutical Sciences, Associate Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 10 years, experience of scientific and pedagogical activity – 7 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Modeling of scientific research”. Research interests: drug technology.

**Pull-Luzan Viktoriia Viktorivna**

PhD (Pharmaceutical Sciences), Assistant Professor of the Drug Technology Department of the National University of Pharmacy. Experience of scientific activity – 6 years, experience of scientific and pedagogical activity – 4 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Medicines for special purposes”, “Modeling of scientific research”. Research interests: drug technology.

**5. Consultations** take place every Tuesday from 9.00 to 12.00 and every Thursday from 13.00 to 17.00 at the Department of Drug Technology according to the schedule.

**6. Short annotation:** The academic discipline "Pharmacy-based Technology of Drugs" refers to the cycle of the main disciplines of professionally oriented training of specialists in the specialty "226 Pharmacy, Industrial Pharmacy", the educational program "Pharmacy", which is intended for applicants for higher day education (Phm (5.0 d)) and forms their knowledge and skills on the main provisions and trends in the development of pharmaceutical technology in the countries of the world and in Ukraine; assimilation of modern principles of regulatory documents and technologies for the production of medicines in various dosage forms using new groups of excipients and modern types of equipment in a pharmacy. Final control - credit. Exam - assessment.

**7. The purpose of the discipline:** there is the assimilation by applicants of higher education of the theoretical foundations and practical skills and abilities of manufacturing medicines in a pharmacy, taking into account the requirements of good pharmacy practice; the rules for drawing up technological documentation for the manufacture of medicines, the rules for their storage and packaging; mastering knowledge of characteristics, classification and assortment of finished dosage forms; the formation of theoretical knowledge and professional skills among applicants for higher education by studying the influence of excipients on the quality of drugs, which makes it possible to more fully realize the scientific and creative potential of future specialists. Mastering the theory and practice of making dosage forms is necessary for a specialist to perform the duties of a specialist, provided for by legal procedural legislation and the corresponding order of the Ministry of Health of Ukraine.

**8. The format of the discipline:** conducting lectures and practical classes for a better understanding of the topic.

**9. Program results of study:**

As a result of studying the academic discipline, the applicant for education will be able to:

- use the normative documentation that regulates the technology and quality control of extemporal medicines in Ukraine and abroad;
- to choose a rational technology for the preparation of solid, liquid, soft, aseptic dosage forms, using the necessary equipment, computer programs for extemporal formulation;
- determine the modes of sterilization of dosage forms, taking into account the physicochemical properties and stability of medicinal substances;
- maintain production documentation of the technological process;
- to draw up technological instructions for extemporal prescription of drugs and prescription of drugs "for future use", taking into account the physicochemical properties of the ingredients.
- to master practical skills in the preparation of solid, liquid, soft, aseptic dosage forms, using the necessary equipment, computer programs for extemporal formulation.

**10. The scope of the discipline:** 8,0 credits EKTC: 255 hours of classroom classes, from them - 16 hours of lectures, 122 hours - laboratory classes. 117 hours of independent work.

**11. Prerequisites of the academic discipline:** “Biophysics”, “Inorganic chemistry”, “Physical and colloidal chemistry”, “Biology with the basics of genetics”.

**12. Hardware and software:** computer, multimedia device, screen.

**13. Academic Discipline Policies:** No form of violation of academic virtue is tolerated. In the event of such events, the response is in accordance with the provisions of the NUPh.

**14. The scheme of the discipline:**

Date	Lectures	Materials of educational and methodical complex
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04.09.20	Modern requirements to the preparation of nonsterile medicines in pharmacies. General questions of powders technology. Technological peculiarities of powders preparation with poisonous and strong-effective substances.	<p>1. Pharmacy — based technology of drugs : the manual for applicants of higher education / O. I. Tykhonov , T. G. Yarnykh, O. A. Rukhmakova, G. B. Yuryeva ; Edited by O. I. Tykhonov and T. G. Yarnykh. — Kharkiv : NUPh : Golden Pages, 2019. — 488 p.</p> <p>2. Tests. Pharmacy-based technology of drugs: a handbook for the out-of-class work of English applicants / T. G. Yarnykh, O. I. Tykhonov, O. A. Rukhmakova, G. B. Yuryeva, M. V. Buryak, V.V.; ed. by T.G. Yarnykh. – Kh.: NUPh, 2019. – 156 p</p> <p>3. <a href="https://tl.nuph.edu.ua/informaciya-dlya-studentiv/fakultet-farmaciya/fakultet-z-pidgotovki-inozemnix-gromadyan/">https://tl.nuph.edu.ua/informaciya-dlya-studentiv/fakultet-farmaciya/fakultet-z-pidgotovki-inozemnix-gromadyan/</a></p>
11.09.20	Technology of powders with dyeing, aromatic and hardly grinding substances. Technology of powders with extracts and semiproducts	
18.09.20	Liquid dosage forms. Preparation of concentrated solutions. Technology of mixtures by dissolving dry medicinal substances and using concentrated solutions	
25.09.20	Special cases of aqueous solutions preparation. Dilution of standard pharmacopoeial liquids. Technology of drops and non-aqueous solutions.	
02.10.20	Technology of HMC and colloidal solutions.	
09.10.20	Technology of suspensions preparation	
16.10.20	Technology of emulsions preparation	
23.10.20	Technology of aqueous extractions from medicinal plant raw material and extracts – concentrates	
<b>Date</b>	<b>Laboratory classes</b>	<b>Materials of educational and methodical complex</b>
<b>THEMATIC MODULE 1. “GENERAL QUESTIONS OF DRUG TECHNOLOGY. POWDERS”</b>		<p>1. Pharmacy — based technology of drugs : the manual for applicants of higher education / O. I. Tykhonov , T. G. Yarnykh, O. A. Rukhmakova, G. B. Yuryeva ; Edited by O. I. Tykhonov and T. G. Yarnykh. — Kharkiv : NUPh : Golden Pages, 2019. — 488 p.</p> <p>2. Workbook for Pharmacy-based Technology of Drugs: A tutorial for the 3-rd year English-speaking applicants of higher education of “Pharmacy” specialty / – Kh.: NUPh, 2019. – 150 p.</p> <p>3. Tests. Pharmacy-based technology of drugs: a handbook for the out-of-class work of English applicants / T. G. Yarnykh, O. I. Tykhonov, O. A. Rukhmakova, G. B. Yuryeva, M. V. Buryak, V.V.; ed. by T.G. Yarnykh. – Kh.: NUPh, 2019. – 156 p.</p> <p>4. Workbook for the preparation to the licensed examination “CROCK-2” on pharmacy-based technology of drugs: for English students of “Pharmacy” speciality: Practical aids. For individual student’s work / Yarnykh T.G., Rukhmakova O.A., and others. – Kh., 2017. – 54 p.</p> <p>5. Reference materials for preparation to the licensed examination “CROCK-2” on Chemist’s Technology of Drugs: for English students of “Pharmacy” speciality: Practical aids. For individual student’s work / Yarnykh T.G., Garkavtseva O.A., and others. – Kh., 2011. – 26 p.</p> <p>6. Guidelines to prepare for the final module control and state attestation on the</p>
07.09.20	General questions of drugs technology. Dosing in pharmacy practice. Preparation of powders with medicinal substances different in prescribed quantity, bulk weight and structure of the particles.	
14.09.20	Preparation of complex powders with poisonous and strong effective substances. Triturations.	
21.09.20	Preparation of complex powders with dyeing substance, aromatic and hardly grinding substances.	
28.09.20	Preparation of complex powders with extracts.	
05.10.20	<b>MC on the topic “General questions of drugs technology. Powders”</b>	
<b>THEMATIC MODULE 2. “ LIQUID DOSAGE FORMS”</b>		
12.10.20	General requirements to the preparation of homogeneous liquid dosage forms in pharmacies. Preparation of concentrated solutions.	
19.10.20	Preparation of liquid dosage forms by using concentrated solutions and dissolution of dry medicinal substances.	
26.10.20	Special cases of solutions preparation. Preparation of liquid dosage forms by diluting standard pharmacopoeia liquids.	
02.11.20	Drops. Non-aqueous solutions.	
09.11.20	Preparation of the HMC and colloidal solutions	
16.11.20	Preparation of suspensions.	
23.11.20	Preparation of emulsions.	
30.11.20	Preparation of aqueous extractions from medicinal plant raw material and extracts – concentrates	
07.12.20	<b>MC on the topic “Liquid dosage forms”</b>	
14.12.20	<b>Final module control 1: «General questions of drug technology. Powders. Liquid dosage forms»</b>	

	<b>Rating upgrade of the final module control 1: «General questions of drug technology. Powders. Liquid dosage forms»</b>	discipline “Chemist’s Technology of Drugs” : for English students of “Pharmacy” speciality: Reference edition. For individual student’s work / Yarnykh T.G., Rukhmakova O.A., and others. – Kh., 2014. – 48 p. 7. <a href="https://tl.nuph.edu.ua/informaciya-dlya-studentiv/fakultet-farmaciya/fakultet-z-pidgotovki-inozemnix-gromadyan/">https://tl.nuph.edu.ua/informaciya-dlya-studentiv/fakultet-farmaciya/fakultet-z-pidgotovki-inozemnix-gromadyan/</a>
<b>THEMATIC MODULE 3. “Soft dosage forms and suppositories”</b>		
14.01.2021-30.06.21	Liniments. Homogeneous ointments.	
14.01.2021-30.06.21	Suspension ointments	
14.01.2021-30.06.21	Emulsion ointments	
14.01.2021-30.06.21	Combined ointments.	
14.01.2021-30.06.21	Suppositories preparation by the rolling method	
14.01.2021-30.06.21	Suppositories preparation by the casting method on hydrophobic bases	
14.01.2021-30.06.21	Suppositories preparation by the casting method on hydrophilic bases	
14.01.2021-30.06.21	<i>MC on the topic “Soft dosage forms and suppositories”</i>	
<b>THEMATIC MODULE 4. “Dosage forms required aseptic conditions of preparation”</b>		
14.01.2021-30.06.21	General requirements to the preparation of solutions for injections. Solutions for injections.	
14.01.2021-30.06.21	Solutions for injections required stabilization. Solutions for injections with thermolabile substances.	
14.01.2021-30.06.21	Isotonic solutions. Solutions for infusions. Suspensions for injections	
14.01.2021-30.06.21	Intra-pharmaceutical products. Dosage forms for newborns and children under 1 year of age	
14.01.2021-30.06.21	Ophthalmic medicinal forms.	
14.01.2021-30.06.21	Medicinal forms with antibiotics.	
14.01.2021-30.06.21	Difficult cases of preparation medicinal forms at the chemist’s.	
14.01.2021-30.06.21	Pharmaceutical incompatibilities.	
14.01.2021-30.06.21	<i>MC on the topic “Dosage forms required aseptic conditions of preparation”</i>	
14.01.2021-30.06.21	<b>Final module control: “Soft dosage forms and suppositories. Dosage forms required aseptic conditions of preparation”</b>	
	<b>Upgrade of rating of module 2: “Soft dosage forms and suppositories. Dosage forms required aseptic conditions of preparation”</b>	
14.01.2021-30.06.21	<b>Exam in the discipline</b>	<b>Consultation before the exam</b>

**15. Assessments and requirements:** the assessment is carried out on a 100-point scale: current control - 2-3 points, the final modular control - 24-40 points. Forms of control: oral questioning, written answer to a theoretical question, situational or test assignment, computer testing.