Syllabus for elective discipline

«Scientific research methodology on the topic of master's thesis»

1. General information	
Faculty	Pharmacy
Educational program	22 Healthcare 226 Pharmacy, Industrially Pharmacy 2nd (master's) level of higher education full-time study
Educational year	2021/2022
Educational discipline, code	ВБ 3.1. **S**cientific research methodology on the topic of master's thesis
Department	Department of Drug Technology and Biopharmaceutics; 79010, Lviv, Pekarska str.,75 Тел. (032)276-85-84, (032) 276-85-98 Kaf_boipharm@meduniv.lviv.ua
Head of the department	Bilous Svitlana Bohdanivna, DSci, assoc. prof. svitlana.bilous@gmail.com
Academic year	V course
Semester	10 semester
Type of discipline	Elective discipline
Educators	Bilous S.B., DSci, assoc.prof., svitlana.bilous@gmail.com, Hudz N.I., DSci, assoc.prof., natali_gudz@ukr.net, Strus O.Ye., DSci, assoc.prof., oxana.strus@ukr.net, Vashchenko O.O, PhD, assoc.prof., o_vashchenko@ukr.net, Yezerska O.I., PhD, assoc.prof.,. o.yezerska@gmail.com
Erasmus	None
Person responsible for syllabus)	Strus O.Ye., DSci, assoc.prof., (oxana.strus@ukr.net)
Number of credits ECTS	15
Number of hours	Total – 450 h: lections – 4 h; practical – 26 h; independent work of students – 420 h
Language of instruction	English
Information on consultations	Consultations are provided in accordance with schedule of consultations by the responsible educators

2. A brief review of the practical training
Elective discipline "Scientific research methodology on the topic of master's thesis " belongs to the cycle of professionally-oriented training disciplines for specialists in the specialty "Pharmacy, Industrial Pharmacy". The elective discipline "Scientific research methodology on the topic of master's thesis" is designed for graduates of higher full-time education, consolidates and deepens the knowledge gained in the study of "Technology of Drugs", improves practical skills and abilities needed to work in industrial conditions and forms the need for the

future specialist to systematically update their knowledge in accordance with modern achievements of the pharmaceutical industry, as well as to apply them in practice.
The subject of the study is to provide professional knowledge and skills in the field of pharmacy and training by acquiring general and special competencies for professional activities.

3. Purpose and objectives of the practical training

1. **The purpose** of the elective discipline " Scientific research methodology on the topic of master's thesis " is to deepen professional knowledge, improve practical skills and abilities necessary for independent decision-making during specific work in production conditions and form a motivated need for future specialists to systematically update their knowledge. to modern achievements of the pharmaceutical industry, as well as to apply them in practice.
2. The main **objective** of the elective discipline is to train a specialist capable of solving complex problems and problems in the field of pharmacy and industrial pharmacy, as well as in planning, writing and defending a dissertation, demonstrating the ability to analyze modern scientific, patent and scientific and technical information in pharmaceuticals. and related fields in order to implement possible scientific innovations, to conduct experimental research in the field of production and quality control of medicines.
The **main goals of a master's thesis** are:

- consolidation and deepening of the knowledge received by the student in the learning process;
- involvement of the student in independent work with professional literature;
- formation of search skills of necessary sources and materials;
- gaining research planning skills;
- gaining experience of clearly, consistently and qualified formulation the theoretical and experimental statements;
- application of practical skills required in professional work; development of skills of analysis, generalization, formulation of conclusions.

3. Competencies and learning outcomes, the formation of which provides the study of the discipline (general and professional competencies).

Integrative competency:
The ability to solve typical and complex specialized tasks and practical problems in the professional pharmaceutical practice using statements, theories and methods of fundamental, chemical, technological, biomedical and social-economic sciences; ability to integrate knowledge and solve complex issues, to formulate judgments in case of insufficient or limited information; to reveal clearly and unambiguously conclusions and knowledge, reasoning them, to the professional and non-professional audience.

General competencies

GC 1 Ability to act socially responsible and civic conscious.
GC 2. Ability to use knowledge in practical situations
GC 3. Desire of saving the environment
GC 4 Ability for abstract thinking, analysis and synthesis; ability to study and to be modernly trained
GC 5 Atmosphere of entrepreneurship, the ability to be proactive.
GC 6. The knowing and understanding of subject field and the understanding of profession.
GC 7. The ability to adapt and act in a new situation.
GC 8. The ability to communicate in the mother tongue in both spoken and written ways, the ability to communicate in other language
GC 9. Abilities to use information and communication technologies.
GC 10 Ability to choose communication strategy, ability to work in team.
GC 11 Ability to evaluate and ensure quality of performed work.
GC 12 Ability to conduct investigations in an appropriate level.
GC 13. Ability to realize their rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.
GC 14. Ability to save and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies. Use different

types and forms of physical activity for active recreation and a healthy lifestyle active recreation and a healthy lifestyle.

Professional competencies:

PC 1 Ability to conduct health education among the population to prevent common diseases, prevent dangerous infectious, viral and parasitic diseases, as well as to facilitate the timely detection and maintenance of adherence to treatment of these diseases in accordance with their medical and biological characteristics and microbiological characteristics

PC 2 Ability to provide advice on prescription and over-the-counter drugs (OTC drugs) and other pharmaceutical products; pharmaceutical care in the selection and sale of OTC drugs by assessing the risk / benefit, compatibility, indications and contraindications based on data on the health of a particular patient, taking into account biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical characteristics of the drug and other pharmaceutical products

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

PC 12 Ability to use in professional activities knowledge of regulations, legislation of Ukraine and recommendations of good pharmaceutical practices.

PC 14 Ability to carry out the production activities of pharmacies for the manufacture of drugs in various dosage forms on prescriptions and orders of medical institutions, including justification of technology and selection of auxiliary materials in accordance with the rules of Good Pharmacy Practice (GPP).

PC 15 Ability to organize and participate in the production of medicines in the context of pharmaceutical companies, including the selection and justification of the technological process, equipment in accordance with the requirements of Good Manufacturing Practice (GMP) with the appropriate development and design of the necessary documentation. Determine the stability of drugs

PC 19 Ability to organize and control the quality of medicines in accordance with the requirements of the current State Pharmacopoeia of Ukraine and good pharmacy practices, determine sampling methods for the control of medicines and standardize them in accordance with current requirements, prevent the spread of falsified medicines.

PC 20 Ability to develop methods for quality control of medicines, including active pharmaceutical ingredients, medicinal plant raw materials and excipients using physical, chemical, physicochemical, biological, microbiological, pharmacotechnological and pharmacoorganoleptic methods.

4. Prerequisites of the elective discipline

To successfully study and master the competencies in this discipline should have basic knowledge of the following disciplines:

ОК 30 Technology of Drugs

ОК 36. Biopharmacy

ОК 37. Good practices in pharmacy

ОК 40. Technology of medicinal cosmetics

ВБ 1.28 World pharmaceutical industry

5. Program learning outcomes

List of learning outcomes

Code of learning outcome	Content of learning outcome	Reference to the code of the competency matrix
* **Kn** – knowledge, **Sk** – skills, **C** – competence, **AR** – autonomy and responsibility		
Kn -1	To know the methods of realization knowledge in solving practical problems	LO-2
Kn -2	To know the requirements of sanitary and hygienic regime and labor protection conditions	LO-3
Kn -3	To know the current trends in the pharmaceutical branch and analyze them	LO-4
Kn -4	To know the structure and features of professional activity	LO-1, LO-6
Kn -5	To know the components of the health care system, planning and evaluating research	LO-1, LO-12

Kn -6	To know technology of the extemporaneous compounding of drugs	LO-5, LO-11, LO-26
Kn -7	To know the main groups of biologically active substances of medicinal raw materials	LO-16, LO-26
Kn -8	To know fundamentals of the system of pharmaceutical legislation, legal and ethical norms of pharmaceutical activity, orders of the Ministry of Health of Ukraine, guidelines for the production of drugs in pharmacies, guidelines for good practices	LO-19, LO-24, LO-26
Kn -9	To know clinical and biopharmaceutical features of different dosage forms	LO-16
Kn -10	To know classification of drugs and dosage forms	LO-19
Kn -11	To know physico-chemical properties of medicinal substance,. types of containers, sealants and packaging materials used in medicine and pharmacy	LO-19
Kn -12	To know technology of industrial drugs	LO-10, LO-11, LO-27
Kn -13	To know GMP requirements and other good pharmaceutical practices	LO-27
Kn -14	Drawing up a material balance of drug production	LO-27
Sk -1	To be able to use professional knowledge to solve practical situations	LO-2
Sk -2	To adhere to the sanitary and hygienic regime and conditions of labor protection	LO-3
Sk -3	To be able to analyze professional information, make well-argued decisions, acquire modern knowledge	LO-1, LO-4
Sk -4	To be able to carry out professional activities that require updating and integration of knowledge	LO-1, LO-6
Sk -5	To be able to use information and communication technologies in the professional field, which requires updating and integration of knowledge	LO-9
Sk -6	To search for scientific sources of information; to make a choice of methods of conducting scientific research; use methods of mathematical analysis and modeling, theoretical and experimental research in pharmacia	LO-5, LO-10, LO-12
Sk -7	To provide comparative characteristics of original (innovative) drugs (brands) and their copies - generic drugs, guided by clinical pharmacological studies, pharmacoeconomic indicators and information database on drugs to justify the optimal choice of drug;	LO-16
Sk -8	To determine the advantages and disadvantages of a particular dosage form of specific drugs of different pharmacological groups, taking into account the biopharmaceutical, pharmacokinetic and pharmacological characteristics of the drug, as well as anatomical and physiological characteristics of the patient (age, sex, physical condition, etc.);	LO-16
Sk -9	To determine the stability of drugs and other pharmaceutical products under storage during the established shelf life	LO-26, LO-27
Sk -10	To use normative legal acts regulating pharmaceutical activity in Ukraine and abroad;	LO-24, LO-26
Sk -11	To characterize dosage forms by types of dispersed systems, method of use, destination, physical state, taking into account the physicochemical properties of active substances and excipients	LO-26, LO-27
Sk -12	To choose the optimal technology for the manufacture of dosage forms, using the appropriate equipment	LO-26, LO-27
Sk -13	To carry out the selection of excipients (stabilizers, emulsifiers, prolongators, ointments and suppositories, fillers for tablets, etc.) for the manufacture of dosage forms;	LO-26, LO-27
Sk -14	To draw up technological schemes and instructions for small-scale production of injectable and infusion solutions in the conditions of small enterprises and hospital pharmacies;	LO-26, LO-27
C-1	To establish appropriate connections to achieve goals	LO-4
C-2	To use information and communication technologies in professional activities	LO-9
C-3	To use information data from scientific sources	LO-12
C-4	To form conclusions and professionally use laws and regulations	LO-24

C-5	To organize the production activities of the pharmacy	LO-26
C-6	Choose the optimal technological process of manufacturing drugs	LO-27
AR-1	To be responsible for the timeliness of decisions made	LO-2, LO-7
AR -2	To be responsible for the timely acquisition of modern knowledge	LO-1, LO-4, LO-24
AR -3	To be responsible for the development of professional knowledge and skills	LO-1, LO-6, LO-9, LO-24
AR -4	To be responsible for the development and implementation of planned projects	LO-12, LO-24
AR -5	To be responsible for compliance with Good Manufacturing Practice	LO-27
AR -6	To be responsible for the extemporaneous compounding of drugs	LO-26

6. Mode and scope of the disicpline

Format of the dicsipline	Full-time study

Type of activity	**Number of hours**	**Number of groups**
lections	4	1
practical	26	1
independent	420	1

7. Topics and content of the disicpline

Code of activity type	**Topic**	**Learning content**	**Code of learning outcome**	**Educator**
L-1 **2 h**	Pharmaceutical development as a basis for creating high-quality, effective and safe drugs. Prospects for the development of drug technology. Biotechnology. Novel dosage forms	Modern concept of pharmaceutical technology as a science. Standardization and product quality. State quality control of medicines. Regulatory documents governing research on pharmaceutical drug development Features of pharmaceutical development of different groups of drugs. Perspectives and directions of biotechnology development and creation of the novel medicines	Kn – 3,5,8,10,12, 13 Sk – 1,3,4,6,7,10 C – 1-4, AR – 2,3,5	Yezerska O.I., PhD, assoc.prof.
L-2 **2 h**	Modern approaches to the technology of solid, semi solid, liquid and sterile medicines. The use of new ingredients and the latest technologies in the production of medicines and cosmetics.	Modern approaches in the pharmaceutical development of different type of dosage form. Compliance with requirements of GPP. The features of cosmetics technology with use of new ingredients	Kn – 3,4,6,8-10,12,13 Sk – 1,3-5,7,10,11 C – 3,4,6 AR –1-3,5,6	Strus O.Ye., DSci, assoc.prof.

		and the latest technologies.		
P-1 **4 h**	Requirements for research on pharmaceutical development of different groups of drugs. Excipients, characteristics of the main groups and requirements for them	Regulatory documents governing the conduct of research on pharmaceutical development. Features of pharmaceutical development of different groups of drugs.	Kn – 3,6,8,9,12,13, Sk – 1,3,6,10,11,13 C – 3,4 AR – 2,3,5	Bilous S.B., DSci, assoc.prof. Hudz N.I., DSci, assoc.prof. Strus O.Ye., DSci, assoc.prof. Vashchenko O.O, PhD, assoc. prof. Yezerska O.I., PhD, assoc.prof.
P-2 **4 h**	Production of solid drugs, their quality control.	Production of solid drugs (granules, tablets, pellets, caplets, capsules, microcapsules, spansul, medulla), quality control. Production of solid drugs for oral use with controlled release, quality control Excipients, characteristics of the main groups and requirements for them	Kn – 2,6,8,10,12-14 Sk – 1,2,10-14 C – 3-6 AR –1,5,6	
P-3 **4 h**	Production of liquid drugs, their quality control	Production of liquid (solutions, emulsions, suspensions, microemulsions, nanosuspensions), semi solid (ointments, creams, gels, patches) and sterile (solutions for prolonged injection, infusion solutions) drugs. Characteristics and classification of them. Characteristics of the main groups of excipients, and requirements for them. Manufacturing methods. Stages of the technological process of manufacturing liquid, semi soild and sterile medicines.	Kn – 1-3,6,8,10-14 Sk – 1-4,10-14 C – 4-6 AR –2,4-6	
P-4 **4 h**	Production of semi solid drugs, their quality control			
P-5 **4 h**	Production of sterile drugs, their quality control.		Kn – 1-3,6,8,10-14 Sk – 1-4,10-14 C – 3,5,6 AR –1-3,5,6	

		Apparatus. Quality control. Packing and labeling.		
P-6 **4 h**	Development of composition and technology of cosmetics of various purposes and actions	The main groups of cosmetic ingredients, their characteristics and biopharmaceutical evaluation. Features of the development of the composition, forms of release and application of different groups of cosmetics	Kn – 1-3,6-11 Sk – 1-4,6,8,10-14 C – 1,3,4 AR –2,3,6	
P-7 **2 h**	Novel dosage forms. Liposomes. Magnetically controlled drugs. Transdermal therapeutic systems. Characteristic. Manufacturing methods, quality control. **Credit**.	Production of new dosage forms containing liposomes, nomenclature of drugs in the form of liposomes. Medical pencils, films, prolonged dosage forms, drug delivery systems to organs and tissues. Magnetically controlled systems : classification, characteristics and requirements for them. Application of transdermal therapeutic systems in medical practice	Kn – 3,8-10,12,13 Sk – 3-5,10 C – 3 AR –2	
ISW on the topic of master's thesis **420 h**	The topic of master's thesis was approved by the order of the Rector of the University	Search, analysis, systematization of information, choice of directions and methods of research; execution, processing, analysis of results, design and preparation for public defense	Kn – 1-14 Sk – 1-14 C – 1-6 AR – 1-6	Scientific supervisors and consultants of master's theses

The main stages of the lesson:

Preparatory stage is topic motivation, control of the initial level of knowledge (basic), the issuance of tasks for independent work.

Control of the initial level of knowledge involves an oral examination and writing a test on the topic.

Main stage is that students receive tasks for independent work, work in groups (4-5 students), draw up protocols.

Final stage is the control of mastering the material by solving problems, oral presentations about the work done. General assessment of each student's work, remarks on the course of the lesson, homework.

In the laboratory classes, it is recommended to fill out a diary in the form of protocols, which record the experimental study results

8. Verification of learning outcomes

Current control

Current control is carried out at each practical lesson in accordance with specific objectives. The assessment form of current educational activity is standardized and includes theoretical training control, which is carried out by means of interrogation, check of protocols with individual practical tasks and situational tasks, and also test written interrogation. Students' independent work is assessed during the current control of the topic in the relevant lesson and involves writing test assignments and oral examination.

For each topic, the student must receive a grade on a 4-point (traditional) scale, taking into account the approved criteria.

Code of learning outcome	Code of activity type	Method of the verification of learning outcomes	Evaluation criteria
Kn – 3-6,8-10,12, 13 Sk – 1,3-7,10,11 C – 1-4,6 AR – 1-3,5,6	L-1, L 2	Criteria for evaluating test control	2 - <50% 3 - 50-60% 4 – 70-80% 5 – 90-100%.
		Protocol evaluation criteria	2 The student does not reproduce practical work, does not have a clear idea of the study object and the necessary skills to do practical work 3 - The student reproduces the part of the practical work, has a vague idea of the study object, does not have the necessary skills to do practical work 4 - The student does the basic provisions and tasks of practical work, shows inappropriateness in doing tasks, works with the help of a teacher with the necessary materials for practical work 5 - The student independently correctly does the tasks of practical work, independently uses information sources and necessary materials.
Kn – 3,6,8,9,12,13, Sk – 1,3,6,10,11,13 C – 3,4 AR – 2,3,5	P-1		
Kn – 2,6,8,10,12-14 Sk – 1,2,10-14 C – 3-6 AR –1,5,6	P-2		
Kn – 1-3,6,8,10-14 Sk – 1-4,10-14 C – 4-6 AR –2,4-6	P-3, P-4	Criteria for evaluating the oral response	2 - The student does not reproduce the study material, has a vague idea of the study object 3 - The student has difficulty reproducing the basic educational material, with errors and inaccuracies gives a definition of the basic concepts and definitions of the topic 4 – The student shows knowledge and understanding of the main provisions of the study material 5 – The student has a systematic, solid knowledge within the requirements of the curriculum, consciously uses them in standard and non-standard situations. Is able to independently analyze, evaluate, summarize the mastered material.
Kn – 1-3,6,8,10-14 Sk – 1-4,10-14 C – 3,5,6 AR –1-3,5,6	P-5		
Kn – 1-3,6-11	P-6		

Sk – 1-4,6,8,10-14 C – 1,3,4 AR –2,3,6 Kn – 3,8-10,12,13 Sk – 3-5,10 C – 3 AR –2 Kn -1-14, Sk -1-14, C-1-6, AR-1-6	P-7 IWS on the topic of master's thesis		
Final control			
General system of evaluation	Exclusively on the basis of the results of the current control in the amount of educational material determined by the work program and in the terms established by the working curriculum, individual curriculum of the student on a 200-point scale		
Evaluation scales	Traditional 4-graded scale, multipoint (200-point) scale, rating ECTS scale		
Criteria to be allowed for final control	Students who have completed the all types of activities provided by the program and scored for current educational activity not less than minimum.		
Type of final control	**Procedure of final control**	Evaluation criteria	
Credit	Student is required to pass all topics of the current control. Grades from the 4-point scale are converted into points on a multi-point (200-point) scale in accordance with the Regulation "Criteria, rules and procedures for evaluating the results of students' learning activities."	*Maximum score* that student can get is 200 points, m*inimum score* – 120. Points for discipline are then converted in traditional 4-graded scale using absolute criteria.	

Evaluation criteria of master's thesis

The grade for the master's thesis is based on the assessment of the performance level and the defense level of the master's thesis and is determined by the traditional 4-point scale (5 - "excellent", 4 - "good", 3 - "satisfactory", 2 - "unsatisfactory").

The final grade for the master's thesis is determined by a multi-point (200-point) scale, a traditional 4-point scale and the ECTS grading scale.

The calculation of the number of points on a 200-point system is based on the obtained grades for the performance and defense of the master's thesis by calculating the arithmetic mean (AM). The resulting value is converted into points on a 200-point scale as follows:

$$X=AM \cdot 200/5$$

Criteria for determining the final drade on the FQW on 200-point, 4-point and ECTS scales.

9. Policy of practical training

Teaching of the elective discipline "Methodology of scientific research on the topic of master's thesis" is carried out in accordance with the "Regulations on the organization of the educational process at the Danylo Halytsky Lviv National Medical University."

Attendance is mandatory. A student who has absences from practical classes is allowed to work off the academic debt until the deadline provided by the schedule. The practice of missed practical classes is carried out by prior appointment of students. Missing classes take place at the department according to the schedule of works by performing practical work, oral examination and checking written assignments on the missed topic.

Students are given the opportunity to recompile unsatisfactory current grades within one week after receiving the current unsatisfactory grade during the practical classes at the department according to the schedule of work.

The issue of permission for a student to complete missed practical classes after the date of the last practical lesson in accordance with the calendar-thematic plan is decided only by the dean's office.
A student who has not scored the minimum score during the current study, has unfinished absences from practical classes, does not receive credit for the discipline.
The student must avoid any violation of academic integrity. Delays in classes and absences without good reason are not allowed; use of a mobile phone, tablet or other mobile devices while interviewing or completing written assignments (unless required by the terms of the assignment). Write-off is prohibited (including with the use of mobile devices).
The main requirements for the preparation, defense and evaluation of master's theses are regulated by the Regulations on the preparation and defense of final qualification work by students of the Faculty of Pharmacy of Danylo Halytsky Lviv National Medical University, developed in accordance with the main requirements of current regulations.
The final grade for the master's thesis, which consists of assessing the level of performance and the level of protection of the FQW, is determined by the traditional 4-point scale and is announced on the defense day.
A student who received 100 or less points on a 200-point scale or a grade of "unsatisfactory" on a traditional 4-point scale is expelled from the university and is issued a standard academic certificate.

10. Literature

Required

Вимоги до виготовлення нестерильних лікарських засобів в умовах аптек / Під ред. акад. АНТКУ проф. О.І.Тихонова і проф. Т.Г.Ярних // Київ, МОЗ України. – 2005. – 98 с.

Вимоги до виготовлення стерильних та асептичних лікарських засобів в умовах аптек / Під ред. акад. АНТКУ проф. О.І.Тихонова і проф. Т.Г.Ярних // Київ, МОЗ України. – 2005. – 76 с.

Державна Фармакопея України / Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів» – 2-е вид. – Харків: Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів», 2015. – Т.1. – 1128 с.

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Практикум з промислової технології лікарських засобів / Під ред. О.А. Рубан. – Х.: НФаУ, 2011. – 342с.

Практикум з промислової технології лікарських засобів / Під ред. О.А. Рубан. – Х.: НФаУ, 2014. – 374с.

Технологія лікарських препаратів промислового виробництва: навч. посіб./ за ред. проф. Д.І. Дмитрієвського. – Вінниця: Нова книга, 2008. – 280 с.

Технологія ліків промислового виробництва: підруч. для студентів вищ. навч. закл. : в 2-х ч. / В.І. Чуєшов, Є.В. Гладух, І.В. Сайко та ін. – 2-е вид., перероб. і допоп. – Х. : НФаУ : Оригінал, 2012. – Ч. 1. – 694 с.

Технологія ліків промислового виробництва : підруч. для студентів вищ. навч. закл. : в 2-х ч. / В.І. Чуєшов, Є.В. Гладух, І.В. Сайко та ін. – 2-е вид., перероб. і допоп. – Х. : НФаУ : Оригінал, 2013. – Ч. 2. – 638 с.

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Технология лекарственных препаратов промышленного производства: Учебное пособие / Д.И. Дмитриевский. Л.И. Богуславская, Л.М. Хохлова и др. – Часть 1. Основные процессы и аппараты в фармацевтическом производстве. Экстракционные препараты. – Х.: Изд-во НФаУ, 2005. – 128 с.

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Additional

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Всесвітня організація охорони здоров'я www.who.int
Державний експертний центр МОЗ України www.pharma-center.kiev.ua
Державний реєстр лікарських засобів України. − [Електронний ресурс]. – Режим доступу: http://www.drlz.com.ua/.
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Офіційний сайт Міністерства охорони здоров’я України: www.moz.gov.ua.
Спеціалізоване медичне інтернет-видання ля лікарів, провізорів, фармацевтів, студентів медичних та фармацевтичних вузів www.morion.ua
Фармацевтична енциклопедія www.pharmencyclopedia.com.ua
Щотижневик Аптека: https://www.apteka.ua/.

Equipment, material, technical, and software support of the dicipline

Classrooms equipped with multimedia facilities and equipment; multimedia presentations, videos, Internet resources.

Lecture material (multimedia presentations, lecture texts, calendar-thematic plan of lectures), calendar-thematic plans of practical classes and IWS

Materials for preparing students for the licensed integrated exam "Step 2. Pharmacy".

12. Additional information

Responsible person for the educational process at the Department – Yakymiv O.V., PhD, assoc.prof., e-mail: olga_yakymiv@ukr.net
It is organized a student scientific group at the Department (scientific advisor - Vashchenko O.O., PhD, assoc.prof., e-mail: o_vashchenko@ukr.net that is focused on the development of medicinal and cosmetic products.
«Regulations on preparation and defense of final qualification work by students of the Faculty of Pharmacy of Danylo Halytsky Lviv National Medical University», http://old.meduniv.lviv.ua/files/datest/polozhennya_pro_vkr.pdf
Classes are held at the Department rooms at: Lviv, Pekarska str., 75, educational and production pharmacy, 2nd floor

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