

MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

Department of *Organization and Economics of Pharmacy with post diploma specialization*

APPROVED

Vice-rector for scientific and pedagogical work

Eduard BURYACHKIVSKY

September 1st, 2024



WORKING PROGRAM IN THE DISCIPLINE
« Methodology of scientific research »

Level of higher education: second (master's degree)

Field of knowledge: 22 «Health care»

Specialty: 226 "Pharmacy, industrial pharmacy"

Educational and professional program: Pharmacy, industrial pharmacy

The working program is compiled on the basis of the educational and professional program "Pharmacy, industrial pharmacy" for the training of specialists of the second (master's) level of higher education in the specialty 226 "Pharmacy, industrial pharmacy" of the field of knowledge 22 "Health care", approved by the Academic Council of ONMedU (minutes #10 dated 27/06/2024).

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The working program is approved at the meeting of the department of Organization and Economics of Pharmacy with post diploma specialization
 Minutes №. 1 dated 29/08/2024.

Head of the department



Oksana BIELIAIEVA

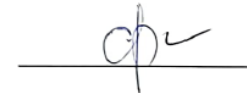
Approved by the guarantor of
 the educational and professional program



Liana UNHURIAN

Approved by the subject-cycle methodological commission for pharmacy's disciplines of ONMedU
 Minutes №. 1 dated 30/08/2024

Head of the subject-cycle methodological commission for pharmacy's disciplines of ONMedU



Natalia FIZOR

Revised and approved at the meeting of the department of Organization and Economics of Pharmacy
 Minutes №. __ dated __/__/20__.

Head of the department

Revised and approved at the meeting of the department of Organization and Economics of Pharmacy

Minutes №. __ dated __/__/20__.

Head of the department

1. Description of the discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the discipline
Total number:	Field of knowledge	<i>Full-time education</i>
Credits of ECTS: 3	22 «Health care»	<i>Elective discipline</i>
Hours: 90	Specialty	<i>Year of training: 5</i>
Content modules: 3	226 "Pharmacy, industrial pharmacy"	<i>Semester: IX</i>
	Level of higher education second	<i>Lectures (0 hours)</i>
	(master's degree)	<i>Seminars (0 hours)</i>
		<i>Practical classes (60 hours)</i>
		<i>Laboratories (0 hours)</i>
		<i>Independent work (30 hours)</i>
		<i>including individual tasks (0 hours)</i>
		<i>Form of final control – test</i>

2. The Purpose and Objectives of the Discipline, Competencies, and Program Learning Outcomes

The purpose is to acquaint applicants with modern methodological concepts, with the basics of the methodology of scientific knowledge and with the methodology of scientific research; to form a holistic view of the research process; master the skills of formation and use of a conscious methodological position of scientific research; to improve the ability to search, select and process scientific information, to accurately formulate the goal, tasks and conclusions of the research, to minimize procedural difficulties in preparing for writing a qualification paper.

The tasks of the discipline are the following:

- - obtaining knowledge in the field of scientific knowledge methodology necessary for writing a scientific qualification paper;
- - acquiring knowledge about the organization of scientific research, writing and design of scientific articles, about the procedure for the defense of a qualification work;
- - obtaining knowledge in the field of organization of scientific and research activities in a higher education institution;
- - the development of the future scientist's personality, the formation of competencies that contribute to self-realization in research activities
- **General (GC):**
 - GC01. Ability to think abstractly, analyze and synthesize, learn and be modernly educated.
 - GC 02. Knowledge and understanding of the subject area and understanding of professional activity.
 - GC 03. Ability to communicate in the national language both orally and in writing.
 - GC 04. The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.
 - GC 05. The ability to evaluate and ensure the quality of the work performed.
 - GC 06. Ability to work in a team.
 - GC 07. The ability to realize one's rights and responsibilities as a member of society; to realize the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.
 - GC 08. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on an understanding of 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, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.

- GC 09. Ability to use information and communication technologies.
- GC 10. The ability to act socially responsibly and consciously.
- GC 11. Ability to apply knowledge in practical situations.
- GC 12. The desire to preserve the environment.
- GC 13. Ability to show initiative and entrepreneurship.
- GC 14. Ability to adapt and act in a new situation.
- GC 15. Knowledge and understanding of the subject area and understanding of professional activity
- GC 16. The ability to conduct experimental research at the appropriate level.
- GC 17. The ability to make decisions and act in accordance with the principle of inadmissibility of corruption and any other manifestations of dishonesty.

- **Special (SC):**

- SC01. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.
- SC 02. The ability to collect, interpret and apply data necessary for professional activity, research and implementation of innovative projects in the field of pharmacy.
- SC 03. Ability to solve pharmacy problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.
- SC 04. The ability to clearly and unambiguously convey one's own knowledge, conclusions and arguments in the field of pharmacy to specialists and non-specialists, in particular to people who are studying.
- SC 07. The ability to carry out sanitary and educational work among the population for the purpose of prevention of common diseases, prevention of dangerous infectious, viral and parasitic diseases, as well as for the purpose of promoting timely detection and support of adherence to the treatment of these diseases according to their medico-biological characteristics and microbiological features.
- SC 08. The ability to consult on prescription and non-prescription drugs and other products of the pharmacy assortment; pharmaceutical care during the selection and sale of medicinal products of natural and synthetic origin by assessing the risk/benefit ratio, compatibility, taking into account biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical and chemical features, indications/contraindications for use guided by data on the health status of a particular patient.
- SC 09. Ability to provide pre-medical assistance to the sick and injured in extreme situations and emergencies.
- SC 10. The ability to monitor the effectiveness and safety of the population's use of medicines according to data on their clinical and pharmaceutical characteristics.
- SC 11. The ability to identify medicinal products, xenobiotics, toxins and their metabolites in biological fluids and body tissues, to conduct chemical and toxicological studies for the purpose of diagnosing acute poisoning, drug and alcohol intoxication.
- SC 12. Ability to ensure proper storage of medicinal products of natural and synthetic origin and other products of the pharmacy assortment in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in healthcare facilities.
- SC 13. The ability to organize the activities of the pharmacy to provide the population, health care institutions with medicines and other products of the pharmacy assortment and to introduce appropriate reporting and accounting systems into them, to carry out commodity

- analysis, administrative records taking into account the requirements of pharmaceutical legislation.
- SC 14. The ability to analyze and forecast the main economic indicators of the activity of pharmacies, to calculate the main taxes and fees, to form prices for medicines and other products of the pharmacy assortment in accordance with the current legislation of Ukraine.
 - SC 15. The ability to conduct an analysis of socio-economic processes in pharmacy, forms, methods and functions of the system of pharmaceutical provision of the population and its components in global practice, indicators of the need, effectiveness and availability of pharmaceutical care in terms of medical insurance and reimbursement of the cost of medicines.
 - SC 17. The ability to carry out pharmaceutical development and participate in the production of medicinal products of natural and synthetic origin in the conditions of pharmaceutical enterprises in accordance with the requirements of Good Manufacturing Practice (GMP).
 - SC 18. The ability to organize and carry out general and marketing management of assortment, product and innovation, price, sales and communication policies of pharmaceutical market subjects based on the results of marketing research and taking into account market processes at the national and international levels, to manage risks in the pharmaceutical supply system. FC19. The ability to organize and carry out quality control of medicinal products of natural and synthetic origin in accordance with the requirements of the current edition of the State Pharmacopoeia of Ukraine, quality control methods (QC), technological instructions, etc.; to prevent the distribution of low-quality, falsified and unregistered medicinal products.
 - SC 20. Ability to develop and evaluate methods of quality control of medicinal products of natural and synthetic origin, including active pharmaceutical ingredients, medicinal plant raw materials and auxiliary substances using physical, chemical, physico-chemical, biological, microbiological, pharmaco-technological methods; carry out standardization of medicinal products in accordance with current requirements.
 - SC 21. The ability to ensure the rational use of prescription and non-prescription drugs in accordance with the physicochemical, pharmacological characteristics, biochemical, pathophysiological features of a particular disease and pharmacotherapeutic schemes of its treatment.
 - SC 22. The ability to monitor the effectiveness and safety of the use of medicinal products by the population according to the data on their clinical and pharmaceutical characteristics, as well as taking into account subjective signs and objective clinical, laboratory and instrumental criteria for the examination of the patient.
 - SC 23. The ability to develop, implement and apply management approaches in the professional activity of pharmacies, wholesale brokers, manufacturing enterprises and other pharmaceutical organizations, argue the principles of HR management and self-management, demonstrate leadership skills.
 - SC 24. Ability to use knowledge of regulatory and legislative acts of Ukraine and recommendations of proper pharmaceutical practices in professional activities.
 - SC 25. The ability to demonstrate and apply in practical activities communicative communication skills, fundamental principles of pharmaceutical ethics and deontology based on moral obligations and values, ethical standards of professional behavior and responsibility in accordance with the Code of Ethics of pharmaceutical workers of Ukraine and WHO guidelines.
 - SC 26. The ability to organize and participate in the production of medicinal products in the conditions of pharmaceutical enterprises, in particular, the selection and justification of the technological process, equipment in accordance with the requirements of Good Manufacturing Practice (GMP) with the appropriate development and execution of the necessary documentation. Determine the stability of medicines.

- SC 27. The ability to organize and carry out the procurement of medicinal plant raw materials in accordance with the rules of the Good Practice of Cultivation and Collection of Raw Materials of Plant Origin (GACP), as a guarantee of the quality of medicinal plant raw materials and medicines based on them.
- SC 28. The ability to predict and substantiate ways of solving the problem of preservation and protection of thickets of wild medicinal plants, in accordance with current legislation.
- SC 29. The ability to develop and implement the quality management system of pharmaceutical enterprises in accordance with the requirements of current Standards, to conduct quality audits and risk management for the quality of pharmaceutical products.
- SC 30. Ability to diagnose emergency conditions.
- FC31. Ability to carry out medical evacuation measures.
- SC 32. Ability to perform medical manipulations.

Program learning outcomes (PLO) are:

PLO01. Have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements.

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

PLO 03. Have specialized knowledge and skills/skills for solving professional problems and tasks, including for the purpose of further development of knowledge and procedures in the field of pharmacy.

PLO 04. Communicate freely in the national and English languages orally and in writing to discuss professional problems and results of activities, presentation of scientific research and innovative projects.

PLO 05. To evaluate and ensure the quality and efficiency of activities in the field of pharmacy.

PLO 06. Develop and make effective decisions to solve complex/complex problems of pharmacy personally and based on the results of joint discussion; to formulate the goals of one's own activity and the activity of the collective, taking into account public and industrial interests, the general strategy and existing limitations, to determine the optimal ways of achieving the goals.

PLO 07. Collect the necessary information on the development and production of medicinal products, using professional literature, patents, databases and other sources; systematize, analyze and evaluate it, in particular, using statistical analysis.

PLO 08. Develop and implement innovative projects in the field of pharmacy, as well as related interdisciplinary projects taking into account technical, social, economic, ethical, legal and environmental aspects.

PLO 09. Formulate, argue, clearly and concretely convey to specialists and non-specialists, including higher education students, information based on one's own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PLO 10. To carry out sanitary and educational work among the population for the purpose of prevention and in case of outbreaks of dangerous infectious, viral and parasitic diseases.

PLO 11. Determine the advantages and disadvantages of drugs of natural and synthetic origin of various pharmacological groups, taking into account their chemical, physicochemical, biopharmaceutical, pharmacokinetic, pharmacodynamic features and the type of dosage form. Recommend to consumers medicinal products and other products of the pharmacy assortment with the provision of advisory assistance and pharmaceutical care.

PLO 12. Provide pre-medical assistance to patients in emergency situations and victims in extreme situations.

PLO 13. Record cases of side effects when using medicinal products of natural and synthetic origin; evaluate the factors that can affect the processes of absorption, distribution, deposition, metabolism and excretion of drugs and are determined by the condition and characteristics of the human body and the pharmaceutical characteristics of drugs.

PLO 14. Choose biological objects of analysis, determine xenobiotics, toxins and their

metabolites in them;

to evaluate the obtained results.

PLO 15. Predict and determine the influence of environmental factors on the quality and consumer characteristics of medicinal products of natural and synthetic origin and other products of the pharmacy assortment, organize their storage in accordance with their physical and chemical properties and the rules of Good Storage Practice (GSP).

PLO 16. Implement appropriate organizational and management measures to provide the population and health care institutions with medicines and other products of the pharmacy assortment; to carry out all types of reporting and accounting in pharmacy institutions, administrative record-keeping and commodity analysis.

PLO 17. Calculate the main economic indicators of pharmacy establishments, as well as taxes and fees. Form all types of prices (wholesale, purchase and retail) for medicinal products and other products of the pharmacy assortment.

PLO 18. To use data from the analysis of socio-economic processes in society for the pharmaceutical supply of the population, to determine the effectiveness and availability of pharmaceutical care in terms of medical insurance and reimbursement of the cost of medicines.

PLO 19. Develop technological documentation for the manufacture of medicinal products, choose a rational technology, manufacture medicinal products in various dosage forms according to the prescriptions of doctors and the requirements (orders) of treatment and prevention institutions, prepare them for release.

PLO 20. Carry out pharmaceutical development of medicinal products of natural and synthetic origin in the conditions of industrial production.

PLO 21. To ensure competitive positions and effective development of pharmaceutical organizations, including taking into account the results of marketing research and market processes at the national and international levels.

PLO 22. Ensure and carry out quality control of medicinal products of natural and synthetic origin and document its results; draw up quality certificates and analysis certificates taking into account the requirements of the current edition of the State Pharmacopoeia of Ukraine, quality control methods (QC), technological instructions, etc.; implement measures to prevent the distribution of low-quality, falsified and unregistered medicinal products.

PLO 23. Determine the main chemical and pharmaceutical characteristics of medicinal products of natural and synthetic origin; choose and/or develop quality control methods for the purpose of their standardization using physical, chemical, physico-chemical, biological, microbiological and pharmaco-technological methods in accordance with current requirements.

PLO 24. Conduct professional activities in social interaction based on humanistic and ethical principles; to identify the future professional activity as socially significant for human health.

PLO 25. Observe the norms of the sanitary and hygienic regime and the requirements of safety equipment when carrying out professional activities.

PLO 26. Argue information for decision-making, bear responsibility for them in standard and non-standard professional situations; adhere to the principles of deontology and ethics in professional activity.

PLO 27. To perform professional activities using creative methods and approaches.

PLO 28. To carry out professional communication in the state language, to use oral communication skills in a foreign language, analyzing specialized texts and translating foreign language information sources.

PLO 29. To carry out professional activities using information technologies, "Information databases", navigation systems, Internet resources, software and other information and communication technologies.

PLO 30. Adhere to the norms of communication in professional interaction with colleagues, management, consumers, work effectively in a team.

PLO 31. Use methods of evaluating performance quality indicators; identify reserves for

increasing labor efficiency.

PLO 32. Analyze information obtained as a result of scientific research, summarize, systematize and use it in professional activities.

PLO 33. Determine the influence of factors that affect the processes of absorption, distribution, deposition, metabolism and excretion of the medicinal product and are caused by the condition, characteristics of the human body and the physicochemical properties of medicinal products.

PLO 34. Use the data of clinical, laboratory and instrumental studies to monitor the effectiveness and safety of the use of medicinal products.

PLO 35. Manage pharmaceutical organizations and determine its effectiveness using management functions. Make management decisions based on the developed leadership and communication skills of pharmaceutical personnel regarding the strategic planning of enterprise activities.

PLO 36. Plan and implement professional activities on the basis of normative legal acts of Ukraine and recommendations of proper pharmaceutical practices

PLO 37. Contribute to the preservation of health, in particular the prevention of diseases, the rational prescription and use of medicines. To conscientiously fulfill one's professional duties, to comply with the legislation on the promotion and advertising of medicinal products. Possess psychological communication skills to achieve trust and mutual understanding with colleagues, doctors, patients, consumers

PLO 38. To substantiate the technology and organize the production of medicinal products at pharmaceutical enterprises and draw up technological documentation regarding the production of medicinal products at pharmaceutical enterprises.

PLO 39. Organize and carry out rational procurement of medicinal plant raw materials. Develop and implement measures for the protection, reproduction and rational use of wild species of medicinal plants.

PLO 40. Ensure quality control of medicinal products and document its results. To carry out quality risk management at all stages of the life cycle of medicinal products.

PLO 41. Determine the main clinical syndrome or symptom that determines the severity of the victim's condition by making a reasoned decision about the person's condition under any circumstances (in the conditions of a health care facility, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.

PLO 42. To organize the provision of medical aid and medical evacuation measures to the population and military personnel in emergency situations and hostilities, including in field conditions.

PLO 43. To organize the necessary level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.

As a result of studying the academic discipline, the student of higher education must:

Know:

- goals and objectives of scientific research;
- the methodology of conducting scientific research;
- the importance of methodological training for the professional activity of a scientist;
- characteristics of the main methods of scientific knowledge;
- scientific terminology and be able to use it correctly;
- peculiarities of design and organization of experiments;
- classification and peculiarities of economic and statistical application
- methods of processing research results;

Be able to:

- work with a disciplinary array of publications;
- conduct search, accumulation and processing of scientific information;
- plan and organize scientific research;

- work with information sources;
- conduct an analysis of theoretical and experimental data;
- formulate conclusions and proposals.

3. Content of the Discipline

Content module 1.

FUNDAMENTAL PRINCIPLES OF SCIENTIFIC RESEARCH METHODOLOGY

Topic 1. Methodology of science: formation, concept, subject, main principles

Science as a system of knowledge. Definition and components of science. Functions of science. Classification of sciences. The process of cognition as a basis for scientific activity. Formation of the methodology of science. Concept of methodology of science

Topic 2. General characteristics of scientific research processes

Technology of scientific research. The essence, purpose, object and subject of scientific research. Main types and stages of scientific research.

Topic 3. Methods of scientific research

Concept and typology of scientific research methods. The essence, purpose, functions of a scientific experiment. Scientific forecasting as a research method: content, main types and implementation technologies.

Content module 2.

ORGANIZATION AND CONDUCT OF SCIENTIFIC RESEARCH

Topic 4. Information provision of scientific research

The concept of scientific information and its role in conducting scientific research. Types of information sources.

Topic 5. Methods of searching and collecting scientific information.

Bibliographic apparatus of scientific research. Information and its types. Search and analysis of scientific information. Rules for compiling a bibliographic description for lists of literary sources. Rules for citations and bibliographic references in the texts of scientific works. Incorrect use of scientific literary sources. Signs of plagiarism.

Topic 6. Preparation and writing of theses of the conference, scientific article

The essence of reports (messages) at the conference. The form of the report (message), summary of the speech. Construction of the report: issues, presentation of the main material, conclusions. Preparation for the performance, main points. Publication of the report in international, all-Ukrainian and regional collections of conference abstracts. Scientific article: concepts, functions. Methods of preparation and requirements for the design of a scientific article. Text writing technique. Construction of the text: statement of the problem, analysis of the latest research, statement of the task, contribution of the main material, conclusions, list of used literature. The importance of writing scientific articles for master's students as future scientists.

Content module 3.

ORGANIZATION OF QUALIFICATION WORK AT THE MASTER'S LEVEL OF HIGHER EDUCATION

Topic 7. Preparation for the qualification work.

Requirements and preparation of qualification works. Compilation of an individual master's work plan. Development of a calendar plan for the completion of the final scientific qualification work. Development of a plan for the implementation of the results of scientific research.

Topic 8. Types, peculiarities of presentation and forms of implementation of research results

Justification of the topic, development of its content, conducting scientific research, approbation of research results in the practice of activity of research objects.

4. The Structure of the Discipline

Names of topics	Number of hours				
	Total	including			
		lectures	seminars	practical classes	Lab classes
Content module 1.					
FUNDAMENTAL PRINCIPLES OF SCIENTIFIC RESEARCH METHODOLOGY					
Topic #1. Methodology of science: formation, concept, subject, main principles	9	-	-	6	3
Topic #2. General characteristics of scientific research processes	7	-	-	4	3
Topic #3. Methods of scientific research	11	-	-	8	3
Current test control #1	4	-	-	2	2
Total by content module 1	31	-	-	20	11
Content module 2.					
ORGANIZATION AND CONDUCT OF SCIENTIFIC RESEARCH					
Topic #4. Information provision of scientific research	7	-	-	4	3
Topic #5. Methods of searching and collecting scientific information.	11	-	-	8	3
Topic #6. Preparation and writing of theses of the conference, scientific article	11	-	-	8	3
Current test control. Control of practical skills #2	4	-	-	2	2
Total by content module 2	33	-	-	22	11
Content module 3.					
ORGANIZATION OF QUALIFICATION WORK AT THE MASTER'S LEVEL OF HIGHER EDUCATION					
Topic 7. Preparation for performance of qualification work.	11	-	-	8	3

Topic 8. Types, peculiarities of presentation and forms of implementation of research results.	11	-	-	8		3
Grade test	4	-	-	2		2
Total by content module 3	26	-	-	18		8
Total hours	90	-	-	60	-	30

5. Topics of Lectures / Seminars / Practical classes / Laboratory Classes

5.1. Themes of lectures

lectures are not provided.

5.2. Themes of seminar classes

Seminars are not provided.

5.3. Topics of practical classes

#	Topic	Hours
1.	Topic 1. Practical class 1. Science as a system of knowledge. Definition and components of science. Functions of science. Classification of sciences.	2
2.	Topic 1. Practical class 2. The process of cognition as a basis for scientific activity.	2
3.	Topic 1. Practical class 3. Formation of the methodology of science. Concept of methodology of science	2
4.	Topic 2. Practical class 4. Technology of scientific research. The essence, purpose, object and subject of scientific research.	2
5.	Topic 2. Practical class 5. Main types and stages of scientific research.	2
6.	Topic 3. Practical class 6. Concept and typology of scientific research methods.	2
7.	Topic 3. Practical class 7. The essence, purpose, functions of a scientific experiment.	2
8.	Topic 3. Practical class 8. Scientific forecasting as a research method: content, main types and implementation technologies.	2
9.	Topic 3. Practical class 9. A systematic approach in scientific research.	2
10	Practical class 10. <i>Current test control #1.</i>	2
11	Topic 4. Practical class 11. The concept of scientific information and its role in conducting scientific research	2

	of research Types of information sources.	
12	Topic 4. Practical class 12. Information provision of scientific research. Rules for compiling a bibliographic description for a list of literary sources.	2
13	Topic 5. Practical class 13. Bibliographic apparatus of scientific research. Information and its types.	2
14	Topic 5. Practical class 14. Search and analysis of scientific information.	2
15	Topic 5. Practical class 15. Rules for compiling a bibliographic description for a list of literary sources. Rules for citations and bibliographic references in the texts of scientific works.	2
16	Topic 5. Practical class 16. Incorrect use of scientific literary sources. Signs of plagiarism.	2
17	Topic 6. Practical class 17. The essence of reports (messages) at the conference. Report form (message). Construction of the report.	2
18	Topic 6. Practical class 18. Preparation for the performance, main points.	2
19	Topic 6. Practical class 19. Scientific article: concepts, functions. Methods of preparation and requirements for the design of a scientific article.	2
20	Topic 6. Practical class 20. Text writing technique. Construction of the text.	2
21	Practical class 21. <i>Current test control #2.</i>	2
22	Topic 7. Practical class 22. Requirements and registration of qualification works. Planning the writing of the work by the acquirer.	2
23	Topic 7. Practical class 23. Drawing up an individual work plan.	2
24	Topic 7. Practical class 24. Development of a calendar plan for the completion of the final scientific qualification work.	2
25	Topic 7. Practical class 25. Development of a plan for the implementation of the results of scientific research.	2
26	Topic 8. Practical class 26. Methods of presentation of scientific research materials.	2
27	Topic 8. Practical class 27. Language and style of scientific work.	2
28	Topic 8. Practical class 28. Approbation and publication of the results of scientific research.	2
29	Topic 8. Practical class 29. Implementation of results and effectiveness of scientific research.	2

30	Practical class 30. <i>Grade Test</i>	2
31	Total	60

5.4. Topics of laboratory classes

Laboratory classes are not provided.

6. Independent Student Work

No.	Title of the topic / types of assignments	Hours
1.	Topic 1. Preparation for practical classes 1-3	3
2.	Topic 2. Preparation for practical lesson 4-5	3
3.	Topic 3. Preparation for practical classes 6-9	3
4.	Practical lesson 10. Preparation for passing the current test control No. 1	2
5.	Topic 4. Preparation for practical class 11-12	3
6.	Topic 5. Preparation for practical classes 13-16	3
7.	Topic 6. Preparation for a practical lesson 17-20	3
8.	Practical lesson 21 . Preparation for passing the current test control No. 2	2
9.	Topic 7. Preparation for practical classes 22-25	3
10.	Topic 8. Preparation for practical class 26-29	3
11.	Practical lesson 30 . Preparation for passing the current test control No. 3	2
	Total	30

7. Teaching methods

Practical classes: conversation, role-playing games, solving situational problems, cases, solving calculation problems, practicing the skills of analyzing the pharmaceutical market, practicing the skills of calculating the market situation, practicing the skills of pricing drugs and medical products, training exercises on the design and development of various types of promotion of medicines and medical products.

Independent work: independent work with the recommended basic and additional literature, with electronic information resources.

8. Forms of Control and Assessment Methods (including criteria for evaluating learning outcomes)

Current control: oral survey, testing (form or computer), control written works, evaluation of individual tasks, evaluation of calculation problem solving, evaluation of practical skills, evaluation of communication skills during role play, solution of situational/cases tasks, assessment of activity in class.

Final control: : Grade Test.

Assessment of the ongoing learning activity at the practical class:

1. Assessment of the theoretical knowledge on the theme:
 - methods: individual survey on the theme, participation of the students in the discussion of problem situations;
 - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.
2. Assessment of practical skills on the theme:
 - methods: assessment of the solution of situational tasks (including calculation) on the

theme;

- the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.

Criteria of ongoing assessment at the practical class

Excellent «5»	The applicant is fluent in the material, takes an active part in discussing and solving the situational problem, confidently demonstrates practical skills.
Good «4»	The applicant has a good command of the material, participates in the discussion and solution of the situational problem, demonstrates practical skills.
Satisfactory «3»	The acquirer does not have enough knowledge of the material, takes part in the discussion and solution of the situational problem without confidence, demonstrates practical skills with significant errors.
Unsatisfactory «2»	The applicant does not possess the material, does not participate in the discussion and solution of the situational problem, does not demonstrate practical skills.

Credit Test is considered, if the student has completed all the tasks of the working program of the educational discipline. He/she took actively participated in the practical exercises. The student has an average current rating of at least 3.0 and has no academic debt.

9. Distribution of points, obtained by the student

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

Conversion table of traditional to multi-point

National score for the discipline	The sum of scores for the discipline
Excellent («5»)	185 – 200
Good («4»)	151 – 184
Satisfactory («3»)	120 – 150
Unsatisfactory («2»)	Less than 120

A multi-point scale (200-point scale) characterizes the actual success of each applicant in learning the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is given to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional evaluation and and ECTS scores

Score on the ECTS scale	Statistical indicator
A	The best 10% students
B	Next 25% students
C	Next 30% students
D	Next 25% students
E	Next 10% students

10. Methodological support

- Working program in the discipline
 - Syllabus
 - Methodological recommendations for the practical classes in the discipline
 - Methodological recommendations for the individual work of students
- Educational and methodical literature:

11. Questions for preparing for the final inspection

1. The main periods of the development of science.
2. Definition of the term "pharmacy".
3. Definition of science.
4. Characteristics of the goal and task of science.
5. Definition of a scientific idea, hypothesis, theory, law.
6. Definition of concepts and judgments.
7. Characteristics and classification of sciences in Ukraine.
8. Academic degrees that exist in Ukraine.
9. Academic titles that exist in Ukraine.
10. The concept of method.
11. Classification of methods of scientific knowledge according to the degree of generality and sphere of action.
12. General scientific classification of research methods.
13. Methods of empirical research.
14. Methods of theoretical research.
15. Methods of research at the empirical and theoretical levels (for hallnological ones).
16. Modeling method (definition, purpose,
17. The concept of scientific activity and scientific research.
18. Stages of organization of research work.
19. Content of the preparatory stage of the research process.
20. The sequence of studying the state of the research object.
21. Characteristics of the theoretical prerequisites for the organization of research work.
22. Sequence of stages of organizational and methodical research preparation.
23. Content of the experimental stage of the research process.
24. Characteristics of the process of creating new information.
25. The sequence of conducting research using theoretical and empirical methods.
26. Content of the final stage of the research process.
27. Generalization of research results and their discussion.
28. Procedure for approbation and implementation of research results.
29. The role of information in scientific research, its essence.
30. Documentary information and its types.
31. Classification of scientific documents.

32. Types of secondary information and its characteristics.
33. Published and unpublished documents.
34. Library and information activities.
35. Electronic search of scientific information on the Internet.
36. Scientometric databases.
37. Search systems of scientific information.
38. Analysis of scientific information.
39. Concept and functions of scientific publication.
40. Scientific article and its structure.
41. Requirements for writing a scientific article.
42. Basic methodological techniques for writing a scientific article.
43. Scientific report and its types.
44. Rules for preparing a report.
45. Structure and content of the report.
46. Stages of preparation of a scientific report and speech.
47. Definition of the qualification (master's) thesis, its purpose and tasks.
48. Basic requirements for qualification (master's) theses.
49. The structure of the qualification (master's) thesis.
50. The sequence of performance of qualification (master's) work.
51. The preparatory stage of the performance of the qualification (master's) thesis is the choice of the topic, object and subject of the research, formulation of the goal and tasks.
52. Algorithm for writing a qualification (master's) thesis.
53. Conducting a literature search and creating a list of the literature used.
54. Work on the text of the qualification (master's) thesis. Introduction, outline of the main content, conclusions, appendices.
55. Literary design of the qualification (master's) thesis.
56. Typical mistakes in writing and design of a qualification (master's) thesis.
57. Preparation for the defense and defense of the qualification (master's) work.
58. The main directions of scientific activity of ONMedU.

12. Recommended literature

Basic

1. Ranjit Kumar. Research Methodology A Step-by-Step Guide for Beginners 528 p
2. TEXTBOOK OF RESEARCH METHODOLOGY First Edition ISBN - 978-93-94198-18-0 Dr.E. Kamatchi Mahalakshmi, Dr. S Sriranjani Mokshagundam, Dr.J.Thirumagal, Dr.S. Sheeba, Dr. M.M.Malini. 198 p.

Additional

1. Silva, J.G.C. (2022). Science and Scientific Method. International Journal of Science and Research, 11(4):621 - 633. Access 01 October 2022. Available: https://www.ijsr.net/get_abstract.php?paper_id=SR22412084104. [2] Silva, J.G.C. (2022). Scientific Research. International Journal of Science and Research, 11(9): 635 - 648. Access 03 October 2022. Available: https://www.ijsr.net/get_abstract.php?paper_id=SR22914021617
2. (PDF) Scientific Research Methods. Available from: https://www.researchgate.net/publication/364354753_Scientific_Research_Methods [accessed Oct 12 2024].
3. Darwish, M. A. (November 2016). The Relationship between the creative and critical thinking skills (analytical study in fine art philosophy), Journal of international academic research for multidisciplinary, (JIARM), (4)10, pp.176:191

4. (PDF) METHODOLOGY OF SCIENTIFIC RESEARCH AND ITS MODERN DIVISIONS ACCORDING TO WITHNEY, MARQUIS, GOOD AND SCATES, AND VAN DALEN. Available from:
https://www.researchgate.net/publication/359442630_METHODODOLOGY_OF_SCIENTIFIC_RESEARCH_AND_ITS_MODERN_DIVISIONS_ACCORDING_TO_WITHNEY_MARQUIS_GOOD_AND_SCATES_AND_VAN_DALEN [accessed Oct 12 2024].

13. Electronic information resources

1. Google Scholar or Google Academy: a search engine and a non-commercial bibliometric database that indexes scientific publications and provides data on their citation
<https://scholar.google.com.ua/>
2. A portal to facilitate the procedure of registration of scientific sources in accordance with the requirements of the Higher Attestation Commission (HAC) of Ukraine and the passing of regulatory control when writing publications, coursework, diplomas, dissertations and other scientific works [Electronic resource]. - Access mode: www.vak.org.ua
3. Legislation of Ukraine [Electronic resource]. - Access mode: <https://zakon.rada.gov.ua/laws/main/index>
4. National Library of Ukraine named after V. I. Vernadskyi [Electronic resource]. - Access mode: <http://www.nbuv.gov.ua> .