

MINISTRY OF HEALTH OF UKRAINE

ODESSA NATIONAL MEDICAL UNIVERSITY

**Department of General and clinical pharmacology and pharmacognosy
Department of Organizations and economics of pharmacy with post diploma
specialization
Department of Pharmaceutical chemistry and drug technology**

APPROVE by

Vice-rector of scientific and pedagogical work


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September 01, 2024

**WORKING PROGRAM OF THE DISCIPLINE
PRE-DIPLOMA PRACTICE**

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

Field of knowledge: 22 "Health care »

Specialty: 226 "Pharmacy, industrial pharmacy"

Specialization: 226.01 "Pharmacy"

Educational and professional program: Pharmacy, industrial pharmacy

2024

The work program is based on the educational-professional program (EPP) "Pharmacy, Industrial Pharmacy" for training specialists of the second (Master's) level of higher education in Specialty 226 "Pharmacy, industrial pharmacy" specializations 226.01 "Pharmacy" field of knowledge 22 "Health Care", approved by the Academic Council of ONMedU (minutes № 10 dated June 27, 2024).

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The Work program is approved at the meetings of the Departments of General and Clinical Pharmacology and Pharmacognosy

Minute's № 1, from August 29, 2024

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Minute's № 1, from August 29, 2024

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Minute's № 1, from August 29, 2024

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Approved by the Subject Cycle Methodical Committee for pharmacy disciplines of ONMedU
Minute's № 1, from August 30, 2024

Chairman of the Subject Cycle Committee  Natalia FIZOR

1. DESCRIPTION OF THE PRACTICE

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristic academic discipline	
The total number of: Credits: 3 Hours – 90	Field of knowledge: 22 "Health care" Specialty: 226 "Pharmacy, industrial pharmacy" Specialization: 226.01 "Pharmacy" Level of higher education: second (master's)	<i>Full-time education</i>	
		<i>Compulsory discipline</i>	
		<i>Year of training:</i>	5
		<i>Semester:</i>	X
		<i>Lectures (hours)</i>	0 hours
		<i>Seminar (hours)</i>	0 hours
		<i>Practical classes</i>	50 hours
		<i>Laboratory classes (hours)</i>	0 hours
		<i>Independent work (hours)</i>	40 hours
	<i>Form of the final control</i>	<i>Graded test</i>	

The educational and professional program "Pharmacy, Industrial Pharmacy " of the specialty 226 Pharmacy, Industrial Pharmacy of the second (master's) level of higher education provides for a combination of theoretical, practical and research components. Pre-diploma practice is a Compulsory discipline of the EPP "Pharmacy, Industrial Pharmacy", which is carried out after the completion of theoretical training and before the completion of the master's qualification work.

Pre-diploma practice for higher education seeker's is implemented at the Medical and Pharmaceutical University.

The research objects, individual tasks, and deadlines for their completion are determined by the internship supervisor depending on the topic of the qualification work chosen by the applicant, as well as the scientific achievements of applicants who, during the period of study, were engaged in scientific work (participation in the work of the scientific circle) at the departments of the faculty.

At the beginning of the pre-diploma practice, an introductory conference is held at which the supervisor internship from the department (or the head of departments) introduces higher education applicants with questions about organizing internships, the internship work program, and determining the workplace.

The internship begins with a general briefing on safety in laboratories, which is conducted by the scientific supervisor (or co-supervisor), if necessary, individual briefing is carried out at the workplace. The briefing is completed by the signatures of the applicant and the supervisor who conducted the briefing in the safety briefing journal, after which the applicant agrees on a work plan according to the content of the internship with the supervisor of the qualification work. The deadline for completing each planned type of work is indicated by the start and end dates of the work.

During their pre-diploma practice, applicants can use scientific and technical literature available at the department (laboratory)/research institutions/enterprises.

Weekly meetings are held with applicants, at which they report on the progress of their individual internship plans and report on interim results.

At the end of the pre-diploma practice, a department meeting is held, at which the applicants who have undergone the internship present a report and a diary in written form describing the results of the work performed during the pre-diploma practice.

The final control of the results of pre-diploma practice is carried out in the form of a graded test.

2. THE PURPOSE AND TASKS OF THE EDUCATIONAL DISCIPLINE, COMPETENCIES, PROGRAM LEARNING OUTCOMES

The purpose of pre-diploma practice is to deepen and systematize the knowledge obtained by higher education seeker's in the process of studying and to improve practical skills and abilities in applying modern research methods to ensure high-quality performance and successful defense of the master's thesis.

Tasks:

- formation abilities plan, organize and to implement scientific research, according to acquired knowledge and developed skills and abilities;
- acquaintance with newest scientific information (articles, monographs) tangential to the topic of the qualification work and the design of the literature review;
- definition objects and research subjects ;
- drafting detailed plan performing an experiment;
- search, development and improvement methods and methods experiment;
- development order works on devices, necessary for implementation qualification work;
- improvement skills application informational technologies in search scientific information (articles, monographs, patents) on the topic of the qualification work;
- improving skills in carrying out a planned experiment, processing and presenting its results;
- formation skills and skills works by profession, acquisition experience organizational and teamwork.

The internship process is aimed at forming elements of the following competencies:

The ability to solve research and/or innovative problems in the field of pharmacy and to critically reflect on and solve practical problems in professional pharmaceutical activities using the principles, theories and methods of fundamental, chemical, technological, bio -medical and socio-economic sciences; to integrate knowledge and solve complex issues, to formulate judgments with insufficient or limited information; to clearly and unambiguously convey one's own knowledge, conclusions and their validity to a professional and non-professional audience. The ability to continue learning with a high degree of autonomy.

General (GC):

GC 01. Ability to abstract thinking, analysis and synthesis, to study and be modernly educated.

GC 02. Knowledge and understanding subject areas and understanding professional activities.

GC 03. Ability to communicate in the state language both orally and in writing.

GC 04. Ability communicate foreign in the language (mainly in English) on equal, which ensures effective professional activity.

GC 05. Ability evaluate and provide quality executed works.

GC 06. Ability to work in a team

GC 07. The ability to exercise one's rights and responsibilities as a member of society; to be aware of the values of civic (free democratic) society and the need for it sustainable development, rule of law, human and civil rights and freedoms in Ukraine.

GC 08. Ability to store 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, technology and engineering, use various types and forms of physical activity for active recreation and maintaining a healthy lifestyle lifestyle.

GC 09. Ability use informational and communication technologies.

GC 10. Ability to approve decision and act, adhering to principle inadmissibility corruption and any other manifestations of dishonesty.

Special (SC):

SC 01. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.

SC 02. Ability to collect, interpret and apply data necessary for professional activities, research and implementation of innovative projects in the field of pharmacy.

SC 03. Ability to solve pharmacy problems in new or unfamiliar environments with 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 reasoning in the field of pharmacy to specialists and non-specialists, in particular to students.

SC 07. Ability to conduct sanitary and educational work among the population in order to prevent common diseases, prevent dangerous infectious, viral and parasitic diseases, as well as to promote timely detection and maintenance of adherence to the treatment of these diseases in accordance with their medical and biological characteristics and microbiological features.

SC 08. Ability to provide consultation on prescription and non-prescription medicines and other pharmacy products; pharmaceutical care during the selection and sale of medicines 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 carry out home medical care help sick and victims in in extreme situations and emergencies.

SC 10. Ability to monitor the effectiveness and safety of the use of medicines by the population according to data on their clinical and pharmaceutical characteristics.

SC 11. Ability to identify drugs, xenobiotics, toxins and their metabolites in biological fluids and tissues of the body, conduct chemical and toxicological studies to diagnose acute poisoning, drug and alcohol intoxication.

SC 12. Ability to ensure proper storage of medicinal products of natural and synthetic origin and other pharmacy products in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in healthcare facilities .

SC 13. Ability to organize the activities of a pharmacy to provide the population and healthcare institutions with medicines and other pharmacy products and to implement appropriate reporting and accounting systems in them, to carry out commodity analysis, and administrative paperwork taking into account the requirements of pharmaceutical legislation.

SC 14. Ability to analyze and forecast the main economic indicators of pharmacy activities, calculate basic taxes and fees, and set prices for medicines and other pharmacy products in accordance with the current legislation of Ukraine.

SC 15. Ability conduct analysis socio-economic processes in pharmacies, forms, methods and functions of the system of pharmaceutical provision for the population and its components in world practice, indicators of the need, effectiveness and accessibility of pharmaceutical care in the conditions of medical insurance and reimbursement of the cost of medicines.

SC 16. Ability to organize and carry out production activities of pharmacies for the manufacture of medicinal products in in various dosage forms for prescriptions of doctors and requirements (orders) of medical and preventive institutions, including justification of technology and selection of auxiliary materials in accordance with the rules of Good Pharmacy Practice (GPP).

SC 17. Ability to carry out pharmaceutical development and participate in the production of natural and synthetic medicinal products origin in pharmaceutical companies in accordance with the requirements of Good Manufacturing Practice (GMP).

SC 18. Ability to organize and implement general and marketing management of assortment, product innovation, pricing, sales and communication policies of pharmaceutical market entities based on the results of marketing research and taking into account market processes at the national and international levels, and to manage risks in the pharmaceutical supply system.

SC 19. 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 State Pharmacopoeia of

Ukraine, quality control methods (QC), technological instructions, etc.; prevent the distribution of low-quality, falsified and unregistered medicines .

SC 20. Ability to develop and evaluate quality control methods for medicinal products of natural and synthetic origin, including active pharmaceutical ingredients, medicinal plant raw materials and excipients using physical, chemical, physicochemical, biological, microbiological, pharmaco - technological methods; standardize medicinal products in accordance with current requirements.

Program learning outcomes (PLO):

PLO 01. Have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements.

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

PLO 03. Have specialized knowledge and skills to solve professional problems and tasks, including for the purpose of further developing knowledge and procedures in the field of pharmacy.

PLO 04. Communicate fluently in the state and English languages orally and in writing to discuss professional problems and results of activities, present scientific research and innovative projects.

PLO 05. Evaluate and ensure the quality and effectiveness of activities in the field of pharmacy.

PLO 06. Elaborate and accept effective decision with solution complex/complex pharmacy tasks personally and by results common discussion; formulate goals own activities and activities team with taking into account public and production interests, overall strategy and existing constraints, to determine the optimal ways to achieve goals.

PLO 07. Collect 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 specifically communicate to specialists and non-specialists, in ago number to applicants higher education information, What based on own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PLO 10. Conduct sanitary and educational work among the population for the purpose of prevention and in the event of outbreaks of dangerous infectious, viral and parasitic diseases diseases.

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

PLO 12. Provide first aid to patients with emergency conditions and victims in extreme situations.

PLO 13. Record cases of side effects when using medicines of natural and synthetic origin; evaluate factors that may affect the processes of absorption, distribution, deposit, metabolism and breeding medicines and are determined by the condition and characteristics of the human body and the pharmaceutical characteristics of medicines.

PLO 14. Select biological objects for analysis, determine xenobiotics , toxins and their metabolites in them; evaluate the results obtained.

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

PLO 16. Implement appropriate organizational and managerial measures to provide the population and healthcare institutions with medicines and other pharmacy products; to carry out all types

of reporting and accounting in pharmacy establishments, administrative paperwork and commodity analysis.

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

PLO 18. Use data from the analysis of socio-economic processes in society to provide pharmaceutical care to the population, determine the effectiveness and accessibility of pharmaceutical care under conditions of medical insurance and reimbursement of the cost of medicines.

PLO 19. Develop technological documentation for the manufacture of medicinal products, select rational technology, produce medicinal means in various medicines forms according to doctors' prescriptions and requirements (orders) of medical and preventive institutions, to prepare them before discharge.

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

PLO 21. 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 implement quality control of medicinal products of natural and synthetic origin and document its results; issue quality certificates and certificates of analysis 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; select and/or develop quality control methods with purpose their standardization with using physical, chemical, physicochemical, biological, microbiological and pharmaco-technological methods in accordance with current requirements.

As a result of the practice higher education seeker must:

Know:

- methodology scientific research in pharmaceutical industries;
- safety rules in research laboratories, safe working methods and conducting research;
- principles and methodology works on devices;
- methods and receptions preparation and carrying out physicochemical and pharmacological research;
- theoretical foundations and methodology application methods research,
- methodical foundations organizations, planning, preparation and carrying out experiment;
- methodology statistical processing experimental data;

Be able to:

- independently plan and conduct experimental research;
- to justify topic, purpose research and determine its relevance;
- carry out search and analysis scientific literature by chosen one research topic ;
- independently plan and conduct research;
- process received results experiment and analyze their;
- carry out preparation and represent report of conducted species works.

3. THE CONTENT OF THE PRACTICE

Content module 1. Familiarization with the work of departments (laboratories).

Planning of tasks for pre-diploma practice.

1. Familiarization of the applicant with the work of the department (division of an enterprise or scientific institution).

Choice and justification topics research. Formulation practice manager goals, objectives, content, order passage practices, requirements to design reporting documentation. Study of the specifics

of planning, preparation and research methods in various branches of pharmacy.

2. Familiarization with the workplace, establishing communication with the employees of the department (division) who organize scientific activities or directly work on the scientific topic chosen by the applicant.

3. Familiarization of the applicant with the methods, research methods, list of necessary reagents, equipment and possibilities of their application in their future work. Drawing up a plan for conducting experimental work.

4. Drafting individual plan undergraduate practices applicant, specifying the content of the tasks and the schedule for carrying out the research. The research schedule defines the specific deadlines implementation works. All task and terms implementation works reflections in writing in the document "Tasks for pre-diploma practice".

Content module 2. Work with scientific literary sources.

1. The applicant's acquaintance with primary sources, monographs, abstracts on the topic of the study, which are available at the department, as well as with reviews that have been made on this topic by previous researchers, consultation with the scientific supervisor. Analysis and identification by the applicant of studies that interested him, but in his opinion were incomplete and could be continued.

2. Independent search by the applicant of literary sources by domestic and foreign authors (articles, monographs, patents, etc.) on the selected topic, using for search informational resource scientific libraries Odessa National Medical University (ONMedU) , library funds of other scientific institutions, modern databases for information search: electronic resources Elsevier, Science direct, Scopus, Web of Science and the SciFinder search database .

3. The analysis of literary sources is completed by writing a review justifying the goals and objectives of the scientific research.

Content module 3. Implementation of the experimental part of the work and processing of the results.

1. Implementation planned parts research applicant higher education.

2. Independent processing of the obtained experimental results, using modern computer programs for constructing graphic images, tables (Excel), for conducting statistical analysis and constructing chemical formulas (ChemDraw and ChemScetch), for surveys and data collection (Google Forms), drawing appropriate conclusions about the effectiveness of their research.

Content module 4. Preparation of reporting documentation and presentation of the results of pre-diploma practice.

1. Preliminary acquaintance of the applicant with the form and types of reporting documentation on pre-diploma practice (report, diary, presentation) using the example of those available at the department reports and samples.

2. Creating a pre-diploma practice diary, containing a calendar of activities, work notes during the internship, and a description and feedback from the internship supervisor.

3. Preparation of a report on pre-diploma practice, taking into account the main components of the pre-diploma practice and in accordance with the tasks set by the internship supervisor.

4. Preparation and testing of the applicant's scientific research results through participation in domestic and international conferences or publication of scientific articles.

4. STRUCTURE OF THE PRACTICE

Topic	Number hours (Full-time education)		
	Total	including's	
		lectures	Practical classes
Content module 1. Familiarization with work departments (laboratories). Planning tasks undergraduate practices			

1. Familiarizing the applicant with the work of the department (division of an enterprise or scientific institution).	2	-	2	-
2. Getting to know the worker place, establishing communication with the employees of the department (division), who ensure the organization of scientific activities or directly are working over scientifically topic, chosen one applicant.	2	-	2	
3. Familiarization of the applicant with the methods, techniques research, list necessary reagents, equipment and the possibility of their application in their future work. Drawing up a plan for conducting experimental work.	6	-	4	2
4. Drawing up an individual plan for the applicant's pre-diploma practice, indicating the content of the tasks and the schedule for conducting research. Research schedule determines specific deadlines for work completion. All tasks and deadlines are reflected in writing in the document "Tasks for pre-diploma practice".	6	-	4	2
Content module 2. Work with scientific literary sources.				
1. The applicant's acquaintance with primary sources, monographs, abstracts on the topic of the study, which are available at the department, as well as reviews that have been made on this topic by previous researchers, consultancy with a scientific supervisor. Analysis and identification by the applicant of research that interested him, but in his opinion was incomplete and could be continued.	8	-	4	4
2. Independent search by the applicant of literary sources by domestic and foreign authors (articles, monographs, patents, etc.) on the selected topic, using to search information resources of the ONMedU scientific library, library funds others scientific institutions, modern databases for information search: electronic resources Elsevier, Scencedirect, Scopus, Web of Science and the SciFinder search engine.	8	-	4	4
3. The analysis of literary sources is completed by writing a review justifying the goals and objectives of the scientific research.	8	-	4	4
Content module 3. Implementation experimental parts work and processing of results.				
1. Completion of the planned part of the research by the higher education student.	10	-	6	4
2. Independent processing of the obtained experimental results, using modern computer programs for constructing graphic images, tables (Excel), for conducting statistical analysis and constructing chemical formulas (ChemDraw and ChemScetch), for surveys and data collection (Google Forms), drawing appropriate conclusions about the effectiveness of their research.	8	-	4	4
Content module 4. Preparation reporting documentation and presentation of the results of pre-diploma practice.				
1. Preliminary familiarization of the applicant with the form and types of reporting documentation on pre-diploma practice (report, diary) using the examples of reports and samples available at the department.	8	-	4	4

2. Creating a diary for pre-diploma practice, containing a calendar of activities, work notes during practice, and a characteristic-feedback of manager practices.	8	-	4	4
3. Preparation of a report on pre-diploma practice taking into account the main components of the pre-diploma practice and according to the tasks set by the internship supervisor.	8	-	4	4
4. Preparation and testing of the applicant's scientific research results through participation in domestic and international conferences, or publications scientific articles.	8	-	4	4
Total:	90	0	50	40

5. TOPICS OF THE LECTURES / SEMINARIAN / PRACTICAL / LABORATORY CLASSES

5.1 Topics of lecture classes

Lecture classes are not provided

5.2 Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

No.	Topic	Hours
1	2	3
1	Familiarization of the applicant with the work of the department (division of an enterprise or scientific institution). Selection and justification of the research topic. Formulation by the practice manager of the goal, task, content, procedure for completing the practice, requirements for preparing reporting documentation. Study of the specifics of planning, preparation and research methods in various branches of pharmacy.	2
2	Familiarization with the workplace, establishing communication with the employees of the department (division) who organize scientific activities or directly work on the scientific topic chosen by the applicant.	2
3	Familiarization of the applicant with methodologies, research methods, a list of necessary reagents, equipment and their capabilities application in their future work. Drawing up a plan for conducting experimental work.	4
4	Drafting individual plan undergraduate practices applicant, indicating content tasks and schedule implementation research. Schedule research determines specific deadlines implementation works. All task and terms implementation works reflections in writing in document "Task for pre-diploma practice."	4
5	The applicant's acquaintance with primary sources, monographs, abstracts on the topic of the research, which are available at the department, as well as with reviews that have been made on this topic by previous researchers, consultation with the scientific supervisor. Analysis and definition of research by the applicant, which its interested, but on its opinion, were not complete and could have a sequel.	4

6	Independent search by the applicant of literary sources of domestic and foreign authors (articles, monographs, patents, etc.) on the selected topic, using the information resources of the university's scientific library, library funds of other scientific institutions, modern databases for information search: electronic resources Elsevier , Sciencedirect , Scopus , Web of Science and the SciFinder search database .	4
7	Analysis literary sources is ending writing review with justification of the goals and objectives of scientific research.	4
8	Implementation planned parts research applicant higher education.	6
9	Independent processing of the obtained experimental results, using modern computer programs for constructing graphic images, tables (Excel), for conducting statistical analysis and designing chemical formulas (ChemDraw and ChemScetch), for surveys and data collection (Google Forms), drawing appropriate conclusions about the effectiveness of their research.	4
10	Preliminary familiarization of the applicant with the form and types of reporting documentation on pre-diploma practice (report, diary) using the examples of reports and samples available at the department.	4
11	Creating a pre-diploma practice diary, containing a calendar of activities, work notes during the internship, and a description and feedback from the internship supervisor.	4
12	Preparation of a report on pre-diploma practice, taking into account the main components of the pre-diploma practice and in accordance with the tasks set by the internship supervisor.	4
13	Preparation and testing of the applicant's scientific research results through participation in domestic and international conferences or publication of scientific articles.	4
	Total	50

5.4 Topics of laboratory classes

Laboratory classes are not provided.

6. INDEPENDED STUDENTS WORK

No.	Topic	Hours
1	Choose and to justify topic research and to determine basic requirements for internship and reporting.	4
2	Get to know with methods research, necessary reagents and equipment and the possibilities of their application in professional activities.	4
3	Create an individual plan for pre-diploma practice, defining the content of the tasks and deadlines for their completion.	4
4	To carry out independent search for domestic and foreign literary sources on the chosen topic. Use scientific libraries and modern information databases to select relevant scientific information.	4
5	To familiarize yourself with scientific sources on the topic of the research and to obtain advice from the scientific supervisor. To analyze previous research and identify areas that require further study.	4
6	Perform the planned part of the study in accordance with the individual plan, adhering to the chosen methodology. Record, analyze, and summarize the results obtained, drawing up interim conclusions.	4

7	Independently process the results of the experiment, using modern computer programs for constructing graphs and tables, and statistical analysis.	4
8	To study the forms and types of reporting documentation for undergraduate practice (report, diary, presentation) using the examples of samples available at the department.	4
9	Compile and design a pre-diploma practice diary with a calendar of work, work notes during the internship, and feedback from the supervisor.	4
10	Prepare and test the results of scientific research through participation in domestic or international conferences or publication of scientific articles.	4
	Total	40

During the pre-diploma practice, higher education seekers must keep mandatory reporting documentation. The report and practice diary have the status of official documents and are submitted to the department after the internship is completed. In the absence of reporting documentation or its untimely execution, the pre-diploma internship cannot be credited.

1. Diary practices .

The diary includes a calendar schedule for individual tasks, work records during the internship, and a description-feedback from the supervisor. The calendar schedule and work records are filled out by the applicant personally and are mandatory for registration.

2. Report of pre-diploma practices.

The report must be prepared taking into account the individual tasks that the applicant performed during the pre-diploma practice. The document should reflect the degree of independence in performing specific types of work.

The report is prepared directly during the internship period within the time allotted for independent work and must comply with the established requirements and rules for preparing reporting documentation.

In this section, the applicant provides a detailed description of the results of their own research, analyzes them and compares them with data from scientific sources. It is important to determine whether which results are consistent with the literature, which are contradictory, and which do not coincide with published information. Differences with the literature should not be considered an error, as they may indicate new scientific approaches or results. At the same time, in such cases, it is necessary to check the reliability of the data obtained and take into account all factors that could have influenced the course of the study. To substantiate the results, it is advisable to use illustrative materials and tables with statistically processed data.

Particular attention should be paid to formulating conclusions that reflect key scientific and practical results completed work. Conclusions must answer the task set: first, the state of the problem under study is assessed, then methods for its solution, is determined their practical significance and is carried out comparison with already known results.

The report shall be prepared on standard A4 paper (210 × 297 mm). The text must be typed using 1.5 line spacing, Times New Roman font, size 14 pt, and justified alignment.

Margins: left – 30 mm, right – 15 mm, top – 20 mm, bottom – 20 mm. The paragraph indentation must be uniform throughout the text – 10 mm. All pages of the report and appendices must be bound together. The length of the report should be 20–25 pages.

Mandatory components of the report:

- Introduction (place of internship/practice)
- Main part
- Conclusions

7. TEACHING METHODS

Teaching forms:

Practice takes place in the form of practical classes and organization of independent students

work.

Teaching methods:

Practical classes: analysis of literary sources in the chosen direction of research, conducting experimental research, statistical processing of the results obtained, preparation and presentation of reports.

Independent students work: studying literary sources on the topic of research, using computer programs for data processing and graphing, generalization and comparison own results with data literature, design results research and formulation of conclusions.

8. FORMS AND CONTROL OF ASSESMENT METHODS

Current control:

- implementation individual tasks of independent work,
- design diary practices,
- report of pre-diploma practices

Final control: graded test (preparation reports and its defense).

Criteria of ongoing assessment at the Current control

Rating	Assessment criterion
Excellent "5"	The student submitted the report to the practice supervisor on time. The report fully complies with the requirements specified in the methodological guidelines. In particular, the document contains all required sections, the individual assignment is properly completed and correctly formatted, and comprehensive information on the research methods used, the results obtained, and their generalization is provided. In addition, the student demonstrates a high level of mastery of the learning material, as evidenced by a logical and well-argued presentation in the pre-diploma practice report. The student thoroughly and comprehensively covers theoretical aspects, analyzes the obtained data using both primary and additional sources, and confidently applies scientific terminology. The student independently searches for and processes additional information, effectively uses it to accomplish the assigned tasks, demonstrates proficiency in modern information technologies, and completes the work within the established deadlines.
Good "4"	The student submitted the report to the practice supervisor on time. The report generally complies with the requirements specified in the methodological guidelines. In particular, the work contains all required sections, the assignment is properly completed, and includes complete information regarding the research methods used, the results obtained, and their generalization. The student demonstrates a sufficient level of mastery of the learning material, confirmed by a logical and well-argued presentation in the pre-diploma practice report. The theoretical issues are thoroughly addressed, and the obtained results are analyzed using both primary and additional sources. The student confidently uses scientific terminology and is able to independently find and process additional information and apply it to accomplish the assigned tasks. However, minor inaccuracies may occur, or some difficulties may arise when solving more complex tasks.

Satisfactorily "3"	<p>The student submitted the report to the practice supervisor on time; however, the document contains certain inaccuracies and does not fully comply with the established requirements. Although the work includes all required sections, their formatting does not fully meet the standards. The individual assignment is incomplete, as some required elements are missing.</p> <p>The student demonstrates an overall sufficient level of understanding of the learning material; however, the description of independently completed work follows a simplified presentation approach. During the defense of the results, the student experiences difficulties applying theoretical knowledge in practice, as well as in independently searching for and analyzing additional sources of information. Errors made during task completion complicate the formulation of well-founded and accurate conclusions.</p>
Unsatisfactorily "2"	<p>The student submitted the report late, in an improper format (missing required sections of the report or the individual assignment), or the assignment was not completed at all.</p>

Only those applicants who have fulfilled the requirements of the internship program, have no academic debt, and their average score for current activities is at least 3.00 are allowed to take the final test in the form of a graded test.

9. DISTRIBUTION OF POINTS RECEIVED BY STUDENTS OF HIGHER EDUCATION

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:

National Grade	200-Point Grading Scale
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 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 of the pre-diploma practice;
- Syllabus;
- Methodical recommendations to the Pre-diploma practices;
- Scientific publications employees departments (articles, theses, patents, monographs and etc.).
- Electronic resource and bases data (Scopus, Web of Science, ScienceDirect, SciFinder) for searching literature and scientific sources.
- Educational and methodical materials with computer programs (Excel, ChemDraw, ChemSketch, Google Forms) for processing results and plotting graphs.
- Materials for preparing presentations and publications – report templates, requirements for the design of scientific articles and conference abstracts.

List of didactic teaching aids

No.	Name of the used equipment.	Rooms where the equipment is used	Notes
1.	Computers (laptops/PCs) for data processing	Topics with experimental research	15 units.
2.	Laboratory equipment (scales, pipettes, centrifuges)	All topics	30 units.
3.	Graphing and statistical software (Excel, GraphPad)	All topics	
4.	Library and electronic databases (Scopus, Web of Science, SciFinder)	All topics	1 unit
5.	Research and scientific publications of the department staff	All topics	100 units

11. 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. 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. Available:https://www.ijsr.net/get_abstract.php?paper_id=SR22914021617
3. (PDF) Scientific Research Methods. Available from:

https://www.researchgate.net/publication/364354753_Scientific_Research_Methods.

4. 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

5. (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.

12. ELECTRONIC INFORMATIONAL RESOURCE

1. Departments' site: http://info.odmu.edu.ua/chair/economy_pharmacy/files
2. Ministry of Health of Ukraine http://www.moz.gov.ua/ua/portal/dn_20050719_360.html
3. World Health Organization <http://www.who.int/>
4. European Regional Office of the World Health Organization. URL: www.euro.who.int.
5. National Scientific Medical Library of Ukraine <http://library.gov.ua/>
6. National Library of Ukraine named after V.I. Of Vernadsky <http://www.nbu.gov.ua/>
7. Modern healthcare. URL: <https://www.modernhealthcare.com/vital-signs-healthcare-blog>
8. Google Scholar: a search engine and non-commercial bibliometric database that indexes scientific publications and provides citation data. Available at: <https://scholar.google.com.ua/>
9. Compendium online [Electronic resource]. – Available at:<https://compendium.com.ua/uk/>
10. Apteka Weekly [Electronic resource]. – Available at:<https://www.apteka.ua/>
11. Medscape search database [Electronic resource]. – Available at: <https://www.medscape.com/pharmacists>
12. Web of Science scientometric database [Electronic resource]. – Available at: <https://clarivate.com/academia-government/scientific-and-academic-research/research-discovery-and-referencing/web-of-science/>
13. Scopus scientometric database [Electronic resource]. – Available at:<https://www.scopus.com/>
14. PubMed scientometric database [Electronic resource]. – Available at: <https://pubmed.ncbi.nlm.nih.gov/>
15. Cochrane database [Electronic resource]. – Available at:<https://www.cochrane.org/>