

**SYLLABUS OF THE EDUCATIONAL COMPONENT
METHODOLOGY AND LOGIC OF SCIENTIFIC RESEARCH**

(the name of the educational component)

**for applicants for higher education of 1 year of study, full time /part time form
of education (1 year, 6 months)**

of educational program «Quality, standardization and certification»

(Educational Program Name)

in specialty «073 management»

(Code and Specialty Name)

field of knowledge «07 Management and administration»

(Code and Knowledge Field Name)

training for Master

(Higher Educational Level Name)

TEACHER



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Vyacheslavna**

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1. The name of higher education establishment and department: the National University of Pharmacy, Department of Management and Quality Assurance in Pharmacy.

2. Address of the department: Kharkiv, O. Nevskogo str., 18.

3. Web site of the department: <https://quality.nuph.edu.ua/>

4. Information about teacher:

Litvinova Olena Vyacheslavna

Doctor of Pharmacy, PhD in Biology, senior research assistant, professor, professor of department of management and quality assurance in pharmacy of the National University of Pharmacy. Academic experience – more than 20 years, scientific-pedagogical experience – 15 years. She gives lectures: “Strategic management of the organization” (masters); “Intellectual business” (masters); “Methodology and logic of scientific research” (masters); “Quality systems in pharmacy” (masters). Research interests: intellectual resources, innovation, patent protection, pharmacology.

5. Consultations: take place according to the online schedule, which is available on the website of the Department of Quality Management and Assurance in Pharmacy at <https://quality.nuph.edu.ua/>

6. Brief summary of the educational component: “Methodology and logic of scientific research” is part of the compulsory component of the training plan for specialists on the educational and qualification level “Quality, standardization and certification”. The subject of the discipline «Methodology and logic of scientific research» is theoretical, methodological, methodical bases of research activity, its technological, organizational, legal support.

7. The purpose statement of studying the educational component: is formation of knowledge on methodology, theory of method and process, psychology, methodological support of research activity, formation and improvement of such speech skills as English reading, speaking and writing, which will help improve the communicative competence of higher education students.

8. Competences in accordance with the educational program:

Soft- skills / General competences (GC):

GC 1. The ability to conduct research at the appropriate level;

GC 8. The ability to find, process and analyze information from various sources.

Hard-skills / Professional (special) competences (PC):

PC 3. The ability for self-development, lifelong learning and effective self-management.

9. The program learning outcomes: (PLO):

PLO 1. Critically comprehend, choose and use the necessary scientific, methodical and analytical tools for management in unpredictable conditions;

PLO 9. To be able to communicate in professional and scientific circles in state and foreign languages.

10. Status of the educational component: *compulsory*.

11. Prerequisites of the educational component: “Methodology, methods and tools of quality management”, “Information technology in quality management,” etc.

12. The volume of the educational component: 3 ECTS credits.

Full time study: 38 hours of classroom classes, including 19 hours of lectures, 19 hours of practical classes, 52 hours of independent work.

Part time study: 18 hours of classroom classes, including 10 hours of lectures, 8 hours of practical classes, 72 hours of independent work.

13. Organization of training:

The format of teaching the educational component: conducting lectures and practical classes.

Content of the educational component:

Content module 1. Methodology and logic of scientific research

Topic 1. The specifics of scientific knowledge. Dialectical and logical bases of scientific knowledge.

Science as a result and a special kind of cognitive activity of people. The concept of science. Classification of sciences. Science as a system of knowledge. Different types of Knowledge. Scientific hypothesis: species, functions. Laws of dialectics in scientific research. Formal logic in scientific knowledge. Logic in scientific knowledge. Law of thought. Law of Non-Contradiction. Law of Identity. Law of Excluded Middle.

Topic 2. The place of scientific research in the life cycle of pharmaceutical products.

The role of knowledge and information in modern society. The role of innovation in development. Classification of innovations. Innovative process. Priority directions for the development of medicines for the health system. Features of the innovative process associated with the development and launch of medicines.

Topic 3. Legal and regulatory framework governing scientific research.

Law of Ukraine on scientific and scientific and technology activities. Law of Ukraine on innovation activity. Law of Ukraine about the special mode of innovative activities of technology parks. The Strategy of Innovative Development of Economy of Ukraine till 2030. Ukrainian and International protection of intellectual property

Topic 4. Levels and methods of scientific research. The main stages and forms of the scientific research process.

Theoretical research. Deduction & Induction. Analysis and synthesis. An analogy. Abstraction. Historical method. Types and methodologies of empirical research. Survey research. Experimental research. Correlational research. Bibliometric analysis. One-on-one interview. Focus groups. Heuristic technique. Brainstorming. Method of focal objects. The main stages and forms of the scientific research process. Criteria for a good research topic. Steps for conducting empirical research

Topic 5. Intellectual property in scientific research.

Necessity of legal protection of intellectual property objects. The concept of intellectual property rights. The concept of industrial property. Copyright and related rights. Academic integrity. Plagiarism. Non-property and property rights of intellectual property subjects. Objects of industrial property rights, their variety, characteristics and features. The main criteria for the patentability of the invention. Place of Intellectual property in pharmacy.

Topic 6. Organization of scientific research work.

Research Process. Formulation of Research Problem. Extensive Literature Survey. Development of Working Hypothesis. Preparing the Research Design. Collecting the Data. Execution of the Project. Analysis of Data. Hypothesis Testing. Generalizations and Interpretation. Plagiarism. The concept of scientific activity, its types. Forms of organization of research activities. Legal status of the subjects of scientific and scientific and technology activities. Rights and obligations of Manager of a Scientific Institution. Academic (scientific, science/technology) Council of Scientific Institution. Attestation of Scientific Institutions and Research Workers.

Topic 7. Information support of scientific research.

Patent documentation as a source of scientific information in the implementation of developments. Types of Patent Search. Databases of industrial property objects. Information support of scientific research: Academic databases: Scopus, Web of Science, PubMed, Food and drug administration website, etc.

Topic 8. Presentation of scientific research results.

Systematization of research results. Presentation of conclusions and recommendations in the form of a scientific article, abstracts of the report. Requirements for a scientific article and a scientific report. Structure of research article for journal publication. Types of articles. Types of journals: Open Access (OA) Publishing, Fully copyrighted journals, Hybrid journals. Predatory journals. Journal Impact Factor, h- index. Effective presentation skills.

Semester differential supervision**14. Forms and types of academic achievements supervision:***Forms and types of academic achievements supervision*

Progress supervision: oral survey, observation with the participation of applicants during the discussion, preparation of test tasks, solving situational and analytically calculated tasks, independent study of scientific sources with the following comparison of points of view, preparation and presentation of a scientific report (essay), etc.

Supervision of content modules: preparation of test tasks, solution of situational (calculation) problems, etc.).

Semester credit: writing test tasks, solving situational (calculation) problems, etc.

Semester control form: semester credit.

Conditions for admission to the supervision of content modules: for admission to the supervision of content module, it is necessary to have a minimum number of points for the topics 1-8.

Conditions for admission to semester supervision: a current rating of more than 60 points, absence of missed laboratory, practical and seminar classes, fulfillment of all requirements stipulated in the work program of the educational component.

15. Evaluation system of the educational component:

Evaluation system of the educational component: the results of the semester supervision in the form of a semester credit are evaluated on a 100-point, non-differentiated scale ("passed", "failed") and on the ECTS scale.

Points from the educational component are calculated according to this ratio:

Types of evaluation	Maximum number of points (% of the number of points per module - for content modules)
Module 1	
Content module 1: Methodology and logic of scientific research - evaluation of topics (1-8) (work in classes 1-8): work in classes (oral survey, writing test tasks, solving situational (calculation) problems); - supervision of content module 1 (writing test tasks, solving situational (calculation) tasks)	<i>100 (100 %)</i>
Semester Supervision of Module 1	100

The individual work of applicants for higher education is evaluated during the progress supervision and during the content module supervision

16. Academic policies of the educational component:

Academic Integrity Policy. It is based on the principles of academic integrity stated in the POL "On measures to prevent cases of academic plagiarism at the National University of Pharmacy" (<https://nuph.edu.ua/akademichna-dobrochesnist/>). Cheating during the evaluation of an applicant for higher education during supervision activities in practical (seminar, laboratory) classes, supervision of content modules and the semester exam is prohibited (including the use of mobile devices). Abstracts must have correct text references to the used literature. The detection of signs of academic dishonesty in the student's written work is a reason for the teacher not to credit it.

Class attendance policy. An applicant for higher education is obliged to attend classes (POL "On the organization of the educational process of the National University of Pharmacy ") (https://nuph.edu.ua/wp-content/uploads/2020/11/pol-a1.1-38-018_polozhennia-pro-orhanizatsiiu-osvitnoho-protsesu-u-nfau-red.-03-

[2021.doc-zi-zminamy.pdf](#)) according to the schedule (<https://nuph.edu.ua/rozklad-zanyat/>), to observe ethical norms of behavior.

Policy regarding deadlines, working out, rating increase, liquidation of academic debts. The completion of missed classes by an applicant for higher education is carried out in accordance with the POL "Regulations on the completion of missed classes by applicants and the procedure for eliminating academic differences in the curricula of the National University of Pharmacy" (https://nuph.edu.ua/wp-content/uploads/2018/09/pol-a2.2-10-182_polozhennja-pro-vidpracjuvannja-propushhenih-zanjat-ta-porjadok-likvidacii-akademichnoi-riznici-1.pdf) in accordance with the schedule for working out missed classes established by the department. Increasing the rating and liquidating academic debts from the educational component is carried out by the applicants in accordance with the procedure specified in the POL "On the procedure for evaluating the results of training of applicants for higher education at the National University of Pharmacy". Applicants of higher education are obliged to comply with all deadlines set by the department for the completion of written works from the educational component. Works that are submitted late without valid reasons are assessed at a lower grade - up to 20% of the maximum number of points for this type of work.

Policy on appeals of evaluation of the educational component (appeals). Applicants for higher education have the right to contest (appeal) the evaluation of the educational component obtained during control measures. The appeal is carried out in accordance with the POL "Regulations on appealing the results of the final supervision of knowledge by applicants of higher education at the National University of Pharmacy" (https://nuph.edu.ua/wp-content/uploads/2020/11/pol-a2.2.-32-031_polozhennja-pro-porjadok-ocinjuvannja-rezultativ-navchannja-zvo-u-nfau-red.05-2022.pdf).

Policy on the recognition of learning outcomes obtained through non-formal and/or informal education by higher education applicants. Recognition of learning outcomes obtained through non-formal and/or informal education by higher education applicants is carried out in accordance with the Regulations "On the procedure for recognition of learning outcomes obtained through non-formal and/or informal education by higher education applicants at National University of Pharmacy" (https://nuph.edu.ua/wp-content/uploads/2020/11/pol-a2.3-32-208_polozhennja-pro-porjadok-viznannja-rezultativ-navchannja-otrimanij-shljahom-neformalnoi-ta-informalnoi-osviti-red.02-2022.pdf). To evaluate the results of non-formal and/or informal learning of a higher education applicant, the attestation commission determines the scope and methods of demonstrating and measuring these learning outcomes, taking into account their content and possible specifics. The methods for demonstrating and measuring the results of the applicant's non-formal and/or informal learning may differ from the methods used for students in the relevant study programme, but they must ensure the substantive validity of the assessment. The Attestation Commission decides on the recognition of the results of non-formal and/or informal learning of the applicant if the assessment confirms that these results correspond to the learning outcomes provided for by the relevant educational programme.

17. Information and educational and methodical support of the discipline:

The main reading suggestions	
	<ol style="list-style-type: none"> 1. Посилкіна О. В. Методологія наукових досліджень та інноваційний розвиток : навч. посіб. / О. В. Посилкіна, О. В. Літвінова, Ю. С. Братішко - Х. : НФаУ, 2020. – 220 с. 2. Prabhat Pandey, Meenu Mishra Pandey. Research methodology: tools and techniques. – Bridge Center, 2015. – 99 p. 3. Посилкіна, О. В. Управління інноваційною діяльністю : навч. посіб. для здобувачів вищої освіти, які навчаються за ОПП «Фармація» / О. В. Посилкіна, О. В. Літвінова, Ю. С. Братішко. - Х. : НФаУ, 2018. – 270 с. 4. Litvinova E.V., Posilkina O.V., Krutskikh T.V., Kovalenko S.M. Methodology and logic of scientific research : method. recommend. for practical studies for students of educational programs "Quality, standardization

	<p>and certification”, “Healthcare management and pharmaceutical business”. – Kharkiv: NUPh, 2023. – 30 p.</p> <p>5. Litvinova E.V., Posilkina O.V., Krutskikh T.V., Kovalenko S.M. Methodology and logic of scientific research : method. recommend. for seminars for students of educational programs “Quality, standardization and certification”, “Healthcare management and pharmaceutical business”. – Kharkiv: NUPh, 2023. – 18 p.</p> <p>6. Litvinova E.V., Posilkina O.V., Krutskikh T.V., Kovalenko S.M. Methodology and logic of scientific research : method. recommend. for the individual work for students of educational programs “Quality, standardization and certification”, “Healthcare management and pharmaceutical business”, “Business economics”. – Kharkiv: NUPh, 2023. – 28 p.</p>
<p>Supplementary reading suggestions for in-depth study of the educational component</p>	<ol style="list-style-type: none"> 1. Закон України «Про науку і науково-технічну діяльність» № 1977-ХІІ від 13.12.91 р. – [Електронний ресурс] – Режим доступу: http://zakon.rada.gov.ua - Заголовок з екрану. 2. Закон України «Про інноваційну діяльність» від 04.07.2002 р. № 40–IV, із змінами та доповненнями [Електронний ресурс] – Режим доступу: http://zakon.rada.gov.ua - Заголовок з екрану. 3. Закон України «Про лікарські засоби» від 04.04.96 р. № 124-96 із змінами та доповненнями [Електронний ресурс] – Режим доступу: http://zakon.rada.gov.ua - Заголовок з екрану. 4. Закон України «Про охорону прав на винаходи і корисні моделі» від 15.12.93 р. № 3687-ХІІ, із змінами та доповненнями [Електронний ресурс] – Режим доступу: http://zakon.rada.gov.ua - Заголовок з екрану. 5. Agreement on trade-related aspects of intellectual property rights. URL: https://www.wto.org/english/docs_e/legal_e/27-trips.pdf. 6. Posylkina O. V. Patent science. Manual (abstract of lectures) for foreign students in speciality 8.110201 «Pharmacy» / O.V. Posylkina, E.V. Litvinova. – Kharkiv: NUPh «Golden Pages», 2012. – 164 p. 7. Litvinova O, Klager E, Yeung AWK, Tzvetkov NT, Kimberger O, Kletecka-Pulker M, Willschke H and Atanasov AG (2023), Bibliometric analysis and evidence of clinical efficacy and safety of digital pills. Front. Pharmacol. 14:1023250. https://doi.org/10.3389/fphar.2023.1023250 8. Litvinova O, Klager E, Tzvetkov NT, Kimberger O, Kletecka-Pulker M, Willschke H, et al. Digital Pills with Ingestible Sensors: Patent Landscape Analysis. Pharmaceuticals (Basel). 2022 Aug 19;15(8):1025. https://doi.org/10.3390/ph15081025
<p>Current electronic information resources (magazines, websites) for in-depth study of the educational component</p>	<ol style="list-style-type: none"> 1. Офіційний сайт бібліотеки ім. Вернадського [Електронний ресурс]. – Режим доступу: http://nbuv.gov.ua/ 2. Web of science [Електронний ресурс]. – Режим доступу:

	https://mjl.clarivate.com/home?PC=MASTER&Full=Baltic%20Journal%20of%20Economic%20Studies 3. Scopus[Электронный ресурс]. – Режим доступа: https://www.elsevier.com/solutions/scopus/how-scopus-works/content 4. PubMedCentral (PMC) http://www.pubmedcentral.nih.gov/about/openflist.html
Moodle distance learning system	https://pharmel.kharkiv.edu/moodle/course/view.php?id=40 <u>26</u>

18. Technical support and software of the educational component:

Material and technical support: personal computers - 27 units; multimedia projector - 2 units; multimedia screen-2 units; TV - 2 units; Xerox- 1 unit; printer -2 units.

Software: Office Standart; ZOOM videoconferencing program; Modular object-oriented dynamic learning environment MOODLE.