

**Syllabus of the educational component
MODELING OF SCIENTIFIC RESEARCH**

**for students of higher education of the 2nd year of correspondence education
Educational program "Pharmacy"
Specialties 226 "Pharmacy, industrial pharmacy"
Fields of knowledge 22 "Health care"
The second (master's) level of higher education**

TEACHERS



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- 1. Name of higher education institution and department:** National Pharmaceutical University, Department of Drug Technology.
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- 4. Information about teacher: KOVALOV Volodymyr Viktorovich**
PhD (Pharmaceutical Sciences), Associate Professor of a higher education institution of the Pharmaceutical Technology of Drugs department of the National University of Pharmacy. Experience of scientific activity – 14 years, experience of scientific and pedagogical activity – 10 years. Reads courses: “Pharmacy-based Technology of Drugs”, “Biopharmacy”, “Methodology and methods of scientific research”, “Methodology and methods of scientific analysis”, “Modeling of scientific research”. Research interests: drug technology.
- 5. Consultations** take place after classes.
- 6. Annotation of the educational component:** Using the scientific potential of the higher school, improving the quality of training of specialists, instilling in them the need for scientific research when solving professional tasks in practical pharmacy makes it necessary to teach students of higher pharmaceutical education the discipline "Modeling of scientific research". The successful mastery of higher pharmaceutical education graduates in both methodological and methodological principles of conducting research, as well as creative work skills, helps them in the future in effective professional activity. Scientific research is an extremely complex process with its own laws, methodology and methods of conducting. That is why the preparation of a modern master of pharmacy requires not only the formation of encyclopedic, special and worldview knowledge, but also the mandatory acquisition of relevant creative skills and abilities.
- 7. The purpose of teaching the educational component:** the purpose of studying the educational component "Modeling of scientific research" is to acquire knowledge and skills regarding the application of the laws of scientific knowledge, the principles and methods of scientific research, the basic principles of conducting scientific research in the pharmaceutical industry, as well as the form of presenting the results of scientific research.
- 8. Competencies according to the educational program:**
Soft-skills / General competences:
GC 1. The ability to act socially responsibly and civically.
GC 2. Ability to apply knowledge in practical situations, make informed decisions.
GC 4. Ability to think abstractly, analyze and synthesize, learn and be modernly trained.
GC 5. The ability to show initiative and entrepreneurship.
GC 9. Skills in using information and communication technologies.
GC 12. Ability to conduct research at the appropriate level.
Hard-skills / Professional (special) competences (PC):
PC 5. 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 of the patient's examination.
PC 13. 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.

PC 15. The ability to organize and participate in the production of medicines in the conditions of pharmaceutical enterprises, including the selection and justification of the technological process, equipment in accordance with the requirements of Good Manufacturing Practice (GMP) with the appropriate development and preparation of the necessary documentation. Determine the stability of medicines .

9. Program learning outcomes :

PLO1. To carry out professional activities in social interaction based on humanistic and ethical principles; to identify future professional activity as socially significant for human health.

PLO4. Demonstrate the ability to independently search, analyze and synthesize information from various sources and use these results to solve typical and complex specialized tasks of professional activity.

PLO6. Argue information for acceptance decisions , bear responsibility for them in standard and non-standard professional situations ; follow principles deontology and ethics in professional activities .

PLO7. Execute professional activity with use creative methods and approaches .

PLO12. Analyze information obtained as a result of scientific research, generalize, systematize and use it in professional activities .

10. Status of the educational component: selective

11. Prerequisites of the educational component: "Introduction to pharmacy", "Philosophy", "Logic", "Sociology", "Methodology of scientific research", "Ethics and deontology in pharmacy", "Information technologies in pharmacy", "Higher mathematics and statistics ".

12. Volume of the educational component : 3 credits ECTS , 90 hours: 30 hours of classroom classes, of which 9 hours of lectures, 21 hours of practical classes; 60 hours of self-study.

13. Organization of training:

Teaching format of the educational component: lectures, practical classes.

Content of the educational component:

Contentful module 1. Modeling of scientific of research

Topic 1. Science as a sphere of human activity. The history of the development of science. The main periods of its development. Science: purpose, functions, tasks. Basic concepts of science. Classification of sciences.

Topic 2. Methods of scientific research. Definition and classification of methods of scientific knowledge. General methods. Methods of empirical research. Research methods at the empirical and theoretical levels.

Topic 3. Organization and conduct of scientific research. Procedure for organization of research work.

Topic 4. Documentary information and its types. The role of information in scientific research, its essence. Documentary information and its types. Classification of scientific documents.

Topic 5. Search and analysis of scientific information. Library and information activity. Scientometric databases. Search systems of scientific information.

Topic 6. Scientific publication: concepts, functions, main types. Concept and functions of scientific publication. The concept of a scientific article, its structure. Scientific report: concepts, types.

Topic 7. Organization of the completion of the final qualification (master's) work. The sequence of the master's thesis. Preparation for the defense and defense of the final qualification work.

Topic 8. Scientific research at the National Pharmaceutical University. Research activities of the National Pharmaceutical University. Research directions of chemical departments. Research directions of medical and biological departments. Research directions of technological departments.

14. Types and forms of control:

Types and forms of control:

Knowledge control at each lesson : oral survey, preparation of test tasks, solution of practical-orientational tasks.

Control of content modules: compilation of test tasks, solution of practical-orientational tasks.

Semester control form : semester assessment.

Conditions for admission to control of content modules: the presence of a minimum number of points for topics (lessons) of the content module.

Conditions for admission to the semester control : current rating of more than 60 points, availability of the minimum number of points for the control of content module 1, absence of unworked passes of practical and seminar classes, fulfillment of all requirements stipulated by the work program of the educational component.

15. Evaluation system for the educational component:

The evaluation system for the educational component:

The results of the semester control 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 education components are calculated according to the following ratio :

Kinds assessment	Maximum quantity points (% of quantity points for the module - for content modules)
Module 1	
Content module 1: Modeling of scientific research - work in classes : answers to theoretical questions , composition test tasks , solving practical -oriented tasks ; - control of content module 1: answers to theoretical questions , solutions are practically oriented tasks _	100 (10 0 %)
Semester control of the module	100

The self-study of students of higher education is evaluated during the current control and during the control of the content module

16. 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 Ukraine". Writing off when evaluating the success of a student of higher education during control measures in practical and seminar classes, control of content modules is prohibited (including using mobile devices). The detection of signs of academic dishonesty in the student's written work is a reason for the teacher not to enroll it.

Policy regarding class attendance . A student of higher education is obliged to attend classes (POL "On the organization of the educational process of the National Academy of Sciences of Ukraine") according to the schedule (<https://nuph.edu.ua/roGClad-zanyat/>), to observe ethical norms of behavior.

Policy regarding deadlines , working out, rating increase, liquidation of academic debt. The completion of missed classes by a student of higher education is carried out in accordance with the POL "Regulations on the completion of missed classes by students and the procedure for eliminating academic differences in the curricula of the National Academy of Sciences" in accordance with the schedule for making up missed classes established by the department . Increasing the rating and liquidating academic debt from the educational component is carried out by the students in accordance with the procedure specified in the POL "On the procedure for evaluating the results of training of students of higher education at the National Academy of Sciences". 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 assessment from the educational component (appeals). Applicants of 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 semester control of the knowledge of students of higher education at the National Academy of Sciences".

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

Main literature	
	<ol style="list-style-type: none"> 1. Yarnykh T. G., Pul-Luzan V. V., Rukhmakova O. A., Buryak M. V., Orlovetskaya N. F., Dankevich O. S., Kotenko O. M., Yurieva G. B., Herasymova I. V., Kovalov V. V., Levachkova Yu. V., Zhivora N. V., Oliinyk S. V., Sahaidak-Nikitiuk R. V. Modeling of scientific research [URL] : A tutorial for extracurricular activities for applicants for higher pharmaceutical education / ed. prof. T. G. Yarnykh. – Kharkiv : NUPh, 2022. – 140 p. 2. Yarnykh T. G., Rukhmakova O. A., Kotenko O. M., Sahaidak-Nikitiuk R. V., Levachkova Y. V., Kovalov V. V., Buryak M. V., Zhivora N. V., Pul-Luzan V. V., Oliinyk S. V. Modeling of scientific research : Guidelines for conducting practical classes ; 2 Ed. / under the editorship of prof. T. G. Yarnykh. – Kharkiv : NUPh, 2023. – 50 p.

<p>Additional literature for in-depth study of the educational component</p>	<ol style="list-style-type: none"> 1. Textbook of lectures on “Methodology and logic of scientific reaserch”: A tutorial for extracurricular activities for applicants for higher pharmaceutical education / T. G. Yarnykh, O. A. Rukhmakova, M. V. Buryak, Yuryeva G. B., Herasymova I. V., Pul-Luzan V. V., Oliynyk S. V., Orlovetskaya N. F., Kotenko O. M., Dankevych O. S., Kovalev V. V., Levachkova Yu. V., Zhivora N. V., Chushenko V. M. / ed. prof. T. G. Yarnykh. – Kharkiv .: NUPh, 2021. – 115 p. 2. Methodology and logic of scientific reaserch: Guidelines for practical classes for English-speaking applicants of higher pharmaceutical education / T. G. Yarnykh, O. A. Rukhmakova, M. V. Buryak, Yuryeva G. B., Herasymova I. V., Pul-Luzan V. V., Oliynyk S. V., Orlovetskaya N. F., Kotenko O. M., Dankevych O. S., Kovalev V. V., Levachkova Yu. V., Zhivora N. V., Chushenko V. M. / ed. prof. T. G. Yarnykh. – Kh .: NUPh, 2021. – 42 c. 3. Methodological recommendations for preparation for the final modular control in the discipline “Methodology and logic of scientific research”/ T. G. Yarnykh, O. A. Rukhmakova, M. V. Buryak, Yuryeva G. B., Herasymova I. V., Pul-Luzan V. V., Oliynyk S. V., Orlovetskaya N. F., Kotenko O. M., Dankevych O. S., Kovalev V. V., Levachkova Yu. V., Zhivora N. V., Chushenko V. M. / ed. prof. T. G. Yarnykh. – Kh .: NUPh, 2021. – 15 p. 4. Vovk N. Algorithm of user request in archival information and search systems / N. Vovk // Information, communication, society 2018: Materials of the 7th International Scientific Conference ICS -2018. – Lviv: Publishing House of Lviv Polytechnic, 2018. – P. 127-128. 5. Law of Ukraine "On Scientific and Scientific-Technical Activity" // Bulletin of the Verkhovna Rada of Ukraine. – 2007. – No. 2-3, Art. 20. 6. Zatserkovny V. I. Methodology of scientific research: teacher. manual / V. I. Zatserkovny , I. V. Tishaev , V. K. Demidov. – Nizhyn: NSU named after M. Gogol, 2017. – 236 p. 7. History of the Department of Drug Technology of the National Pharmaceutical University: monograph / T. G. Yarnykh, N. F. Orlovetska, O. M. Kotenko and others. ; under the editorship Prof. T. G. Yarnykh. - Kh.: National University of Applied Sciences, 2015. - 316 p. 8. Classification of scientific research methods at the level of agribusiness subjects / H. M. Chorny, L. M. Khudoliy , Y. S. Larina, I. A. Mishchenko // Economics of APC . – 2015. – No. 12. – C. 12. 9. Methodology of scientific research: teaching. manual / V.S. _ Antonyuk , L.G. Polonskyi , V.I. Averchenkov , Yu.A. _ Malakhov. - K.: NTUU "KPI", 2015. - 276 p. 10. Mokin B.I. _ Methodology and organization of scientific research : study guide/ B.I. Mokin , O.B. _ Mokin . – Vinnytsia: VNTU , 2014. – 180 p. 11. Chmylenko , F.O. _ Guide to studying the discipline "Methodology and organization of scientific research" / F.O. Chmylenko , L.P. _ Beetle. - D.: RVV DNU, 2014. - 48 p. 12. Methodology scientific studies : textbook / O. G. Danilyan , O. P. Dzoban . - Kharkiv : Pravo, 2019. - 368 p. 13. Danilyan O. G. Organization and methodology of scientific research: teaching. manual / O. G. Danilyan , O. P. Dzoban . - Kharkiv: Pravo, 2017. - 448 p. 14. Puchenko O. P. Methodological innovations in modern scientific knowledge / O. P. Puchenko // Humanitar . autumn _ ZDIA _ – 2014. – No. 57. – P. 27–37.
<p>Current electronic information resources (magazines, websites, etc.) for in-depth study of the educational component</p>	<ol style="list-style-type: none"> 1. Ministry of Health of Ukraine [Electronic resource]: official website. - Access mode: www.moz.gov.ua - (date of application 09/26/18). 2. National Pharmaceutical University [Electronic resource]: Scientific library of the National Pharmaceutical University. – Access mode: http://lib.nuph.edu.ua (access date 09/26/18).

	<p>3. National Pharmaceutical University. Department of Medicine Technology [Electronic resource]: website of the Department of Medicine Technology. – Access mode: http://tl.nuph.edu.ua (date of application 09/26/18).</p> <p>4. Electronic archive of the library of the National Academy of Sciences of Ukraine. http://lib.nuph.edu.ua; e- mail library@nuph.edu.ua</p> <p>5. Educational portal http://pharmel.kharkiv.edu - the center of distance technologies of the National Academy of Sciences</p>
Moodle distance learning system	https://pharmel.kharkiv.edu/moodle/course/view.php?id=3445

18. Technical and software provision of educational components: computers for testing, multimedia device, screen