

Ministry of Education and Science of Ukraine

Sumy national agrarian university

Faculty of Veterinary Medicine

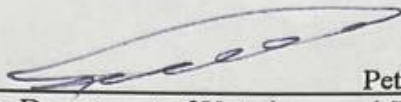
Chair veterinary and sanitary inspection, microbiology, hygiene and pathological
anatomy

Working program (syllabus) educational component

OK 6. Fundamentals of scientific research

Specialty	211 VETERINARY MEDICINE
Educational program	VETERINARY MEDICINE
Level higher education	second (master's) level higher education

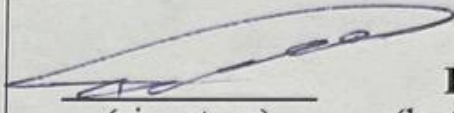
Sumy – 2026

Developer:  Petrov R.V., Doctor of Veterinary Science, Professor, Head of the Department of Veterinary and Sanitary Inspection, Microbiology, Hygiene and Pathological Anatomy

(signature)


(surname, initials)

(scientist degree and rank, position)

Reviewed, approved and ratified at the department meeting veterinary and sanitary inspection, microbiology, hygiene and pathological anatomy (name of the department)	protocol No. 15 dated 02.06.2026	
	Manager departments	<u></u> (signature) Petrov R.V. (last name, initials)

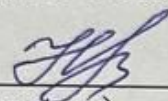
Agreed:

Guarantor educational programs


(signature)

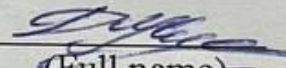
Oleksandr CHEKAN
(full name)

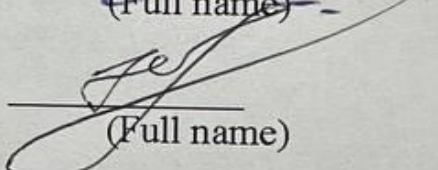
Dean of the faculty where the educational program is implemented


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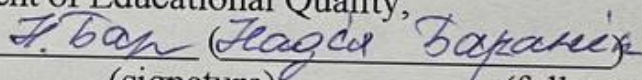
Nagorna L.V.
(full name)

Review of the work program (attached) provided by:


(Full name)


(Full name)

Methodologist of the Department of Educational Quality, licensing and accreditation


(signature)

(full name)

Registered in the electronic database: date: 19.06 . 2026.

Information on reviewing the work program (syllabus):

Academic year in which changes are made	Number of the appendix to the work program with a description of the changes	Changes reviewed and approved		
		Date and number of the minutes of the department meeting	Head of the Department	Educational program guarantor

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name OK	OK6. Fundamentals of scientific research.			
2.	Faculty/department	Veterinary medicine Faculty of Veterinary Medicine / Department of Veterinary Sanitary Inspection, Microbiology, Hygiene and Pathological Anatomy			
3.	Status OK	Mandatory			
4.	Program/Specialty (programs), part of which is the OK for (<i>filled in for mandatory OKs</i>)	211 Veterinary medicine.			
5.	The OK can be offered for (<i>filled in for selective OKs</i>)				
6.	NQF level	NQF of Ukraine – level 7, QF-EHEA – second cycle, EQF-LLL – level 7			
7.	Semester and duration of study	11th semester, 15 weeks 12 semester, 13 weeks			
8.	Number of ECTS credits	5.0			
9.	Total hours and their distribution	Contact work (classes)			Independent work
		Lectures	Practical/seminar	Laboratory	
		2	-		148
		2	-		88
10.	Language of instruction	Ukrainian			
11.	Teacher/Educational Component Coordinator	Dr. Vet . of Sciences, professor R.V. Petrov			
11.1	Contact information	mob tel. +380663927928, e-mail- romanpetrov1978@gmail.com https://vet.snau.edu.ua/kafedri/vetsanekspertizi-mikrobiologi%20i%20zoogigiyeni-ta-bezpeki-i-yakosti-produktiv-tvarinnictva/sklad-kafedri/petrov-roman-viktorovich-d-vet-n-profesor/			
12.	General description of the educational component	<p>The development of social relations significantly depends on people's awareness of scientific achievements and the ability to rationally process the resources of the living environment. This is possible only through the study of forms of scientific research. That is why the textbook summarizes the past and present achievements of domestic and foreign scientists who studied the foundations, methodology and organization of scientific research from different perspectives in order to create a holistic picture of the scientific and methodological foundations of the discipline "fundamentals of scientific research". The textbook is designed for teachers, graduate students, students, as well as everyone who is not indifferent to creative activity.</p>			
13.	Purpose of the educational component	<p>The purpose of teaching is to form an idea in students about the theoretical foundations, methodology of implementation and applied aspects of rational organization of scientific research. In the educational process, the purpose of preparing students and postgraduates for scientific research is to involve them in scientific research work, familiarize them with the strategy and tactics of conducting research, provide knowledge about the methodology, techniques and tools of research, as well as provide methodological and methodological tools for writing diploma and dissertation works, and promote the implementation of research and innovative approaches, methods, and technologies in further production activities.</p>			
14.	Prerequisites for studying OK, connection with other educational	The educational component is based on the study of OK: Internal diseases of animals			

	components of OP	Epizootology and infectious diseases
15.	Academic Integrity Policy	<p>Applicants are explained the value of acquiring new knowledge; the value and functions of academic integrity; they are informed about the inadmissibility of plagiarism, they are encouraged to independently complete educational tasks, correctly refer to sources of information in case of borrowing scientific materials. Cheating during tests and exams is prohibited (including using mobile devices). Written works must have correct text references to the literature used.</p> <p>For violation of academic integrity, students may be held academically liable for the following:</p> <p>Academic plagiarism – score 0, re-do the assignment.</p> <p>Academic fraud (copying, cheating, passing off someone else's work as your own) - cancellation of points received; re-taking the assessment; re-doing the work not completed independently with new initial data;</p> <p>Using electronic devices during the final knowledge test – suspension from work, score 0, retaking the final test</p>
16.	Access to Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=3736
17.	Keywords of the educational component	Materials, research methods, methodology, science

2. LEARNING OUTCOMES BY EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Learning outcomes for OK: After studying the educational component, the student is expected to be able to analyze and apply in practice	Program learning outcomes that the OC aims to achieve (indicate the number according to the numbering given in the OP)			How is RND assessed?
	PRN 2	PRN 10	PRN 20	
DRN 1. Analyze modern scientific sources, research results, and trends in the development of veterinary medicine in order to identify current scientific problems and promising research directions.	+	+	+	<ul style="list-style-type: none"> - survey of theoretical questions, - completing tasks in laboratory and practical classes, - testing, completing independent work tasks
DRN 2. Synthesize information from various scientific sources to formulate hypotheses, define goals and objectives, and plan scientific research in veterinary medicine.	+	+		<ul style="list-style-type: none"> - survey of theoretical questions, - completing tasks in laboratory and practical classes, - testing, completing independent work tasks

DRN 3 analyze and evaluate the methodology of scientific research, the reliability of the results obtained, the correctness of statistical data processing, and the validity of scientific conclusions.	+		+	- survey of theoretical questions, - completing tasks in laboratory and practical classes, - testing, completing independent work tasks
DRN4. evaluate the scientific novelty and practical significance of research results, synthesize conclusions and recommendations, and present the results of scientific work in compliance with the principles of academic integrity.	+	+	+	- survey of theoretical questions, - completing tasks in laboratory and practical classes, - testing, completing independent work tasks

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be addressed within the topic	Distribution within the general time budget			Recommended reading
	Classroom work		Himself. work	
	Luke	Lab with.		
Fall semester				
Topic 1. History of the formation, role and modern content of science. Classification of sciences. Legislative and regulatory regulation of the development of science in Ukraine. Organization of scientific activity in Ukraine. International scientific cooperation of Ukraine. Training of scientific personnel and their employment in Ukraine.	2		30	4,5,18,19
Topic 2. Fundamentals of research methodology. The concept of scientific research methodology. Aspects of the methodology of theoretical and empirical research. Methods of scientific research.			30	2,6,7,18,19
Topic 3. Mastering and using laws in scientific research . Regularities in nature and social life. Law as a category. Laws in natural and technical sciences, social sciences and humanities.			30	2,6,7,18,19
Topic 4. Conducting scientific research			30	1,4,6,11,12,18,19

The essence and main stages of conducting scientific research. Application of a systems approach in scientific research.				
Topic 5. Scientific research database 5.1. The role of information and sources of scientific research. 5.2. The structure and purpose of scientific documents. 5.3. Fundamentals of collecting information material for scientific research. 5.4. Methodology for searching for applied information.			28	4,12,18,19
Total for the fall semester	2		148	150
Spring semester				
Topic 6. Methodology for the implementation and defense of course and diploma theses. 6.1. Concept, general characteristics and requirements for course and diploma theses. 6.2. Main stages of preparation of course and diploma theses. 6.3. Structure and design of course and diploma theses. 6.4. Preparation for defense and defense of course and diploma theses.	2		17	1,4,13,18,19
Topic 7. . Organizational aspects of the formation of scientific and pedagogical personnel7.1. Training of scientific and pedagogical personnel through postgraduate and doctoral studies. 7.2. Obtaining and awarding a scientific degree. 7.3. Procedure for awarding academic titles.			17	11,12,18,19
Topic 8. Organization of the work of the scientific team 8.1. Ethical norms and the value of science. 8.2. Formation of cohesion of the scientific team. 8.3. Organizational aspects of the work of the scientific team. 8.4. Workplace and working day of a scientist.			17	3,18,19
Topic 9. Choosing a direction and planning research work. Analysis of theoretical and experimental research and Formulation of conclusions 1. Defining the object and subject of research, choosing a topic. 2. Justification of the relevance of the chosen topic. 3. Setting the goal and specific objectives of the research. 4. Choosing a method (methodology) for conducting the research. 5. Description of the research process. 6. Discussion of the research results. 7. Formulation of conclusions and evaluation of the results obtained.			17	2, 21, 22

Topic 10. FEATURES OF PATENT RESEARCH			20	3, 18, 19
<ol style="list-style-type: none"> 1. . development of tasks for conducting patent research; 2. development of information search regulations; 3. search and selection of patent and other scientific, technical, and market and commercial information; 4. processing, systematization and analysis of selected information; 5. summarizing the results and preparing a report on patent research. 				
Total for the spring semester	2	-	88	
In just two semesters	4	-	236	240

4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work that will be carried out by the teacher <u>during classroom lessons</u> , consultations)	Number of hours	Teaching methods (what types of learning activities should <u>the student perform independently</u>)	Number of hours
DRN 1. Analyze modern scientific sources, research results, and trends in the development of veterinary medicine in order to identify current scientific problems and promising research directions.	Presentation methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.	6	Learning methods by source of knowledge: <i>Verbal</i> : working with a book (reading, retelling, writing out, taking notes, making tables, graphs, reference notes), <i>Visual</i> : observations. Teaching methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, crossword puzzles, debates, round tables, binary classes, business and role-playing games, group research). Interactive learning technologies (use of multimedia technologies, interactive learning, student collaboration (cooperation)	12
DRN 2. Synthesize information from various scientific sources to formulate hypotheses, define goals and objectives, and plan scientific research	Presentation methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.	6	Learning methods by source of knowledge: <i>Verbal</i> : working with a book (reading, retelling, writing out, taking notes, making tables, graphs, reference notes), <i>Visual</i> : observations. Teaching methods by the	18

<p>in veterinary medicine.</p>	<p><i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets).</p>		<p>nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, crossword puzzles, debates, round tables, binary classes, business and role-playing games, group research). Interactive learning technologies (use of multimedia technologies, interactive learning, student collaboration (cooperation).</p>	
<p>DRN 3 analyze and evaluate the methodology of scientific research, the reliability of the results obtained, the correctness of statistical data processing, and the validity of scientific conclusions.</p>	<p>Presentation methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets).</p>	<p>6</p>	<p>Learning methods by source of knowledge: <i>Verbal</i> : working with a book (reading, retelling, writing out, taking notes, making tables, graphs, reference notes), <i>Visual</i> : observations. Teaching methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, crossword puzzles, debates, round tables, binary classes, business and role-playing games, group research). Interactive learning technologies (use of multimedia technologies, interactive learning, student collaboration (cooperation)</p>	<p>18</p>
<p>DRN4. evaluate the scientific novelty and practical significance of research results, synthesize conclusions and recommendations, and present the results of scientific work in compliance with the principles of academic integrity.</p>	<p>Presentation methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching</p>	<p>6</p>	<p>Learning methods by source of knowledge: <i>Verbal</i> : working with a book (reading, retelling, writing out, taking notes, making tables, graphs, reference notes), <i>Visual</i> : observations. Teaching methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, crossword puzzles, debates, round tables,</p>	<p>16</p>

	methods: (use of multimedia technologies, spreadsheets.		binary classes, business and role-playing games, group research). Interactive learning technologies (use of multimedia technologies, interactive learning, student collaboration (cooperation)	
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5. EVALUATION BY EDUCATIONAL COMPONENT

5.1.Diagnostic assessment (indicated as needed)

5.2.Summative assessment

5.2.1. To assess the expected learning outcomes, there are

No.	Summative assessment methods	Points / Weight in the overall score	Date of compilation
1.	Thematic survey	20 points / 20%	Weekly
2.	Completion of tasks in laboratory and practical classes	20 points / 20%	According to the schedule
3.	Testing	15 points / 15%	Within 7-8 weeks
4.	Doing written work	15 points / 15%	According to the module delivery schedule
5.	Exam	30 points / 30%	According to the schedule

5.2.2. Evaluation criteria

Component ¹	Unsatisfactorily	Satisfactorily	Good	Perfectly ²
Thematic survey	<12 points	12-15 points	15-18 points	20 points
	The student can only play individual fragments from the course.	Most requirements are met, but individual components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All task requirements met	Fulfilled all task requirements, demonstrated creativity, thoughtfulness, proposed own solution to the problem
Completion of tasks in laboratory and practical classes	<12 points	12-15 points	15-18 points	20 points
	Task requirements not met	Most of the tasks are completed using the basic theoretical principles, the student has difficulty explaining the rules for solving laboratory and practical tasks. The completion of individual control tasks is significantly formalized, there is no deep understanding of the	The student has mastered the basic material, understands and performs laboratory and practical tasks, has suggestions for the direction of their solutions. Understands the main provisions that are	The applicant implements the theoretical material of the discipline when performing laboratory and practical work, is able to analyze and compare the results obtained on

¹ Specify the summative assessment component

² Indicate the distribution of points and the criteria that determine the level of assessment

		work.	decisive in the course, can solve similar tasks based on those discussed with the teacher, but allows a small number of inaccuracies.	the basis of the knowledge, skills, and practical abilities acquired in this discipline.
Multiple choice test	≤ 5 points	6–9 points	10–13 points	14–15 points
	The student gives the correct answer to several questions ($\leq 33\%$ correct answers).	The student has certain knowledge provided for in the discipline program, knows the basic provisions being studied, and gives the correct answer to several questions (34–59% of correct answers).	The student generally has a good command of the material, knows the main points of the material, and gives the correct answer to several questions (60–89% of correct answers).	The student demonstrates complete and solid knowledge of the educational material in the volume that corresponds to the discipline program, correctly answers the test questions (90–100% of correct answers).
Preparation and execution of written work	<9 points	10–19 points	20–39 points	40–45 points
	The student does not have a complete understanding of the subject material. The student has not completed independent study of the material.	Despite the fact that the student completed the program of the academic discipline, but individual components were missing or insufficiently worked on, the student worked passively.	Knows the basic provisions that are of decisive importance in performing independent work/individual tasks. Errors in the answers are not significant.	All requirements and tasks were met, creativity and thoughtfulness were demonstrated, and an original solution to the problem was proposed.

5.3. Formative assessment:

To assess current progress in learning and understand areas for further improvement,

No.	Elements of formative assessment	Date
1	Oral feedback after studying topics 1,2,3,4,5,6,7,8	2,4,6,8,10,12,14,15 weeks of the semester
2	Written feedback after studying topics 1-3, 4-8	8.15 weeks of the semester
3	Written feedback from the teacher while working on laboratory and practical tasks	Within 1 week after execution
4	Oral feedback from the teacher after the presentation on the topic of independent study of the discipline	During classes

6. LEARNING RESOURCES (LITERATURE)

- Zou, P. X. W., & Xu, X. (2023). *Research methodology and strategy: Theory and practice*. John Wiley & Sons. <https://doi.org/10.1002/9781394190256>

2. • Thomas, C. G. (2021). *Research methodology and scientific writing*. Springer. <https://doi.org/10.1007/978-3-030-64865-7>
3. • Dunn, P. K. (2021). *Scientific research and methodology: An introduction to quantitative research in science and health*. RStudio PBC.
4. • Kargin, N., Izaak, S., Rozhkov, P., & Ivanus, A. (2023). *Methodology of scientific research*. INFRA-M Academic Publishing LLC. <https://doi.org/10.12737/1882577>
5. • Dromi, S. M., & Stabler, S. D. (2023). *Moral minefields: How sociologists debate good science*. University of Chicago Press.

1. Auxiliary

2. B ilukha , M. T. (2002). *Methodology scientific research* . ABU .
3. Tsekhmistrova , G. S. (2014). *Fundamentals scientific Research* (2nd ed.). Publishing house The name is "The Word" .
4. Krushelnytska , O. V. (2009). *Methodology and Organization scientific research* . Condor .
5. Pushkar , O. I., & Pushkar , I. M. (2020). *Fundamentals scientific research and organization scientific research activities* of the KhNEU named after S. Kuznets .
6. Filipenko , A. S. (2017). *Fundamentals scientific Research : Lecture notes* . Akademydav .
7. Sheyko, V. M., & Kushnarenko, N. M. (2015). *Organization and methodology of scientific research activities* (7th ed.). Knowledge .
8. Mokin , B. I., & Mokin , O. B. (2014). *Methodology and organization scientific research* . VNTU .
9. Goncharenko, S. U. (2010). *Pedagogical Research : Methodological Advice to young scientists* . Lybid .
10. Kovalchuk, V. V., & Moiseev , L. M. (2019). *Fundamentals scientific Research* . Professional .
11. Yerin , A. M., Zakhozhai , V. B., & Yerin , D. L. (2004) . *Methodology scientific Research* Center literature .
12. Petrov, R. V., Fotina , T. I., Shkromada , O. I., & Berezovsky , A. V. (2021). USE OF DISTANCE EDUCATION ELEMENTS IN THE PROCESS OF TRAINING OF VETERINARY MEDICINE SPECIALISTS. *Bulletin Sumy National Agrarian University . Series : Veterinary Medicine* , (4 (55), 12-16. <https://doi.org/10.32845/bsnau.vet.2021.4.2>
13. Petrov, R. V., Zon, G. A., Reshetylo, O. I., Ivanovska, L. B., Panasenکو, O. S., & Kisil , D. O. (2023). CURRENT TRENDS IN TEACHING DISCIPLINES AT THE DEPARTMENT OF VIRUSOLOGY, PATHANATOMY AND POULTRY DISEASES OF SUMMY NAU. *Bulletin of the Sumy National Agrarian University. Series: Veterinary Medicine* , (4(59), 52-58. <https://doi.org/10.32845/bsnau.vet.2022.4.8>
14. Petrov, R. V., Fotina , T. I., Shkromada , O. I., Berezovsky, A. V., Rysovany, V. I., & Bondarenko, P. G. (2023). FEATURES OF THE MIXED FORM OF TRAINING OF STUDENTS AT THE FACULTY OF VETERINARY MEDICINE. *Bulletin of the Sumy National Agrarian University. Series: Veterinary Medicine* , (3(58), 46-50. <https://doi.org/10.32845/bsnau.vet.2022.3.8>

15. Methodological support

16. Petrov R.V. Methodological guidelines for independent work of students in the discipline "Organization and methodology of scientific research" of the full-time form of study of the specialty 211 "Veterinary medicine" and 212 "Veterinary hygiene, sanitation and expertise". Sumy, 2023. 24 p.
17. Petrov R.V., Zon G.A., Reshetylo O.I., Ivanovska L.B., Panasenکو O.S., Information support for scientific research. Methodological guidelines for conducting laboratory and practical classes and independent work of students in the discipline "Organization and methodology of scientific research" of the full-time form of study of the specialty 211 "Veterinary medicine" and 212 "Veterinary hygiene, sanitation and expertise". Sumy, 2021. 27 p.
18. Zon G.A. Methodological guidelines for conducting practical classes and organizing independent work in the discipline "Methodology of scientific research" for students of the specialty 8.110101 "Veterinary medicine" OKR "Master" of the Faculty of Veterinary Medicine on the topic: "Biometric processing of digital data in veterinary medicine using modern information technologies" / G.A. Zon, L.B. Ivanovska, E.V. Vashchyk . - Sumy, 2016. - 27 p.
19. Scientific research methodology: Lecture notes for students of the specialty 8.11010101 "Veterinary Medicine" OKR "Master" (SNAU, FVM, pr. No. 2 dated 11/26/2014).
20. Scientific research methodology: Methodological support for conducting practical classes for students of specialty 211 "Veterinary Medicine" OKR "Master" (SNAU, FVM, pr. No. 2 dated 11/23/2016).
21. Scientific research methodology: Methodological support for independent work of students of specialty 211 "Veterinary Medicine" OKR "Master" (SNAU, FVM, pr. No. 2 dated 11/23/2016).

22. Information resources

23. <https://cdn.snau.edu.ua/moodle/course/view.php?id=3736>
24. <http://www.jalonso.com./libreria.html>
25. <http://www.mlink.net/veterinet/>
26. <http://www.vet.net/>