

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Department of technologies and food safety

Work program (syllabus) of the educational component

**SC 3 Methodology and processing technology
scientific information**

Specialty	181 "Food technologies"
Educational program	Food technologies
Level of higher education	The third (educational and scientific)

Developer:

Anna HELIKH Ph.D., Assoc. Prof., Department of
Technology and Food Safety
(surname, initials) (degree and title, position)

Considered and approved at the meeting of the Department of <u>Technology and Food Safety</u> (name of department)	protocol from <u>04.06.2024</u> No. <u>17</u>
	Head department (signature) <u>Marina SAMILYK</u> (surname, initials)

Agreed:

Guarantor of the educational program
(signature) Oksana MELNYK
(surname)

Dean of the faculty where the educational program is implemented
(signature) Nataliia BOLHOVA
(surname)

The review of the work program was provided by
(signature) Ph.D., Assoc. Prof. Oksana MELNYK
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Doctor of Science, Prof.
(signature) Fyodor PERTSEVOY
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Methodist of the Education Quality Department, licensing and accreditation
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Registered in the electronic database: date: 09.07. 2024

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1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	The name is OK	SC 3 Methodology and processing technology scientific information	
2.	Faculty/department	Food Technologies / Department of Technologies and Food Safety	
3.	The status is OK	Selective	
4.	Program/Specialty (programs), the component of which is OK for (<i>to be filled in for mandatory OK</i>)	OP "Food technologies", 181 Food technologies	
5.	NRK level	8-th level	
6.	Semester and duration of study	4-th semester, 15 weeks	
7.	Number of ECTS credits	5	
8.	The total number of hours and their distribution	Contact work (class)	
		Lectures 10	Laboratory 10
		Independent work 130	
9.	Language of education	English	
10.	Teacher/Coordinator of the educational component	Ph.D., associate professor Helikh A.O.	
11.1	Contact Information	Anna Oleksandrivna Helikh, associate professor of the Department of Technologies and Food Safety, 317a, e - mail: anna.helikh@snau.edu.ua	
11.	General description of the educational component	formation of higher education students knowledge, abilities and skills related to the collection and processing of scientific information.	
12.	The purpose of the educational component	<ul style="list-style-type: none"> - provision of theoretical and practical knowledge to students on learning the methodology and technology of scientific information processing; - determination of the main issues and tasks of scientific processing; - provision of practical knowledge regarding mathematical and statistical methods of scientific information processing. 	
13.	Prerequisites for studying OK, connection with other educational components of OP	The educational component is the basis for OP "Food Technologies": OK 9 Methodology and organization of dissertation preparation and writing.	
14.	Policy of academic integrity	it is not allowed to copy the conclusions of the protocols of laboratory works from each other, in such a case, the laboratory works will be considered unprotected and need to be revised again. In the case of repeated refinement, the work will not be evaluated for the maximum score.	

2. LEARNING RESULTS UNDER THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Study results for EC: After studying the educational component, the student is expected to be able to. "	Program learning outcomes, which are aimed at the achievement of the OK			How PRN is estimated
	PLO 2	PRN 3	PRN 7	
DRN 1 The ability to study the peculiarities of carrying out scientific research, to establish the essence of the main concepts and categories of the methodology of science; mastering the technology of organization of scientific research work, including the study of the logical structure of scientific research, the application of theoretical and empirical methods, the design of the results of scientific research	H	H		Oral defense of practical works Multiple choice final test (modular assessment) The exam is a multiple choice test
DRN 2 The ability to find out the peculiarities of implementing the results of scientific research into practice, evaluating their effectiveness	H		H	Oral defense of practical works Multiple choice final test (modular assessment) The exam is a multiple choice test
LIST OF COMPETENCES THAT WILL BE IMPROVED / ACQUIRED IN THE PROCESS OF INFORMAL EDUCATION				
Design thinking for innovation				
<p>General: the presence of innovative perception of the subject, concretization according to three types: perception of one's own innovations and innovations or discoveries in general, the ability to see elements of the new in the relative constant and the ability to propose a fundamentally new solution to the problem.</p> <p>Professionals: possession of a system of theoretical and practical knowledge, a set of skills; experience of demonstrating competence in real situations of the technological process; the ability to creatively solve professional tasks, the technologist's level of awareness of his knowledge, abilities, skills, and opportunities necessary for the qualified implementation of innovative activities.</p>			<p>Form for confirmation of study results: Certificate of successful completion of studies indicating the number of hours. The authenticity of the certificate can be checked by the link on it.</p>	

3. CONTENTS OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be considered within the topic	Distribution within the general time budget			Recommended Books ¹
	Auditory work		Individual work	
	Lectures	Practice		
Module I				
Lecture lesson 1. Scientific research .	4			[1,2,3,4,5,6,9,14]
Practical lesson 1 . <i>Creation of a database of scientific literary sources</i>		4		[1,2,3,4,5,6,9,17]
Independent work 1. The procedure for carrying out scientific research. Concept, functions and structure of the research program 2. Sequence and stages of execution scientific research			10	[1,2,3,4,5,6,9,13]
Lecture session 2. Technology of research work (part 1)	4			[1,2,3,4,5,6,9,19]
Practical lesson 2 . <i>Creation of a database of patents for inventions and utility models</i>		4		[1,2,3,4,5,6,9,14]
Independent work 3. Economic justification of the choice scientific topic 4. Search, accumulation and processing scientific information			10	[1,2,3,4,5,6,9,17]
Lecture session 3. Technology of research work (part 2)	4			[1,2,3,4,5,6,9,13]
Practical lesson 3. <i>Evaluation of statistical characteristics of measurements</i>		4		[1,2,3,4,5,6,9,19]
Independent work 1. The essence of the experiment, general requirements for conducting it 2. Classification of experiments			10	[1,2,3,4,5,6,9,14]

¹ A specific source from the main or additional recommended literature

Lecture occupation 4. Levels and methods scientific research (part 1)	4			[1,2,3,9,10,11,16]
Practical lesson 4. <i>Patent report research</i>		6		[1,2,3,4,5,6,9,16]
Independent work 1. Stages of preparation of a scientific experiment 2. Classical planning method experimental of research			10	[1,2,3,4,11,12,13,15]
Together for module 1	16	18	40	
Module 2				
Lecture session 5. Levels and methods of scientific research (part 2)	4			[1,2,3,4,5,6,8,14]
Practical lesson 5. Methodology of writing a scientific article		8		[1,2,3,4,5,6,17]
Independent work 1. General characteristics of the processes scientific research. Technology of scientific activity 2. Structure of scientific research 3. Issuance of results reports scientific work			24	[1,2,3,4,5,6,7,13]
Lecture session 6. Design , implementation and evaluation results scientific of research	4			[1,2,3,4,5,6,9,19]
Practical lesson 6. Drafting, registration and submission of an application for the issuance of a patent for an invention and a utility model		10		[1,2,3,4,5,6,8,11]
Independent work 1. Dissertation work as a qualification research 2. Requirements for the dissertation work 3. Research preparation technology work			16	[1,2,3,4,5,6,9,18]
Together for module 2	8	18	40	

Informal education (Prometheus)				
Design thinking for innovation Course program: The course is divided into five parts: What is design thinking? Preparing the mind for innovation Production of ideas Experimentation Final task Analysis tools How to conduct research and draw conclusions How to set priorities Development of recommendations How to conduct research and draw conclusions How to set priorities Development of recommendations	10			https://prometheus.org.ua/course/course-v1:Prometheus+DTI101+2017_T3
	24	36	90	
In total				

4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work to be carried out by the teacher during classroom classes, consultations)	Number of hours	Learning methods (what types of learning activities should be performed by the student independently)	Number of hours
DRN 1 The ability to study the peculiarities of carrying out scientific research, to establish the essence of the main concepts and categories of the methodology of science; mastering the technology of organization of scientific research work, including the study of the logical structure of scientific research, the application of theoretical and empirical methods, the design of the results of scientific research	Problem lectures (questions are raised about the material covered by the teacher, but the lecturer himself answers them, in order to focus students' attention on the main thing) Presentations (demonstration of information on the subject of lectures)	12	Practical classes (fulfillment of tasks in accordance with methodical instructions)	18
			Brain attacks during practical work Individual tasks (independent processing of the information proposed by the teacher)	40

DRN 2 The ability to find out the peculiarities of implementing the results of scientific research into practice, evaluating their effectiveness	Problem lectures (questions are raised about the material covered by the teacher, but the lecturer himself answers them, in order to focus students' attention on the main thing)	12	Practical classes (fulfilment of tasks in accordance with methodical instructions) Brain attacks during practical work Individual tasks (independent processing of the information proposed by the teacher)	18
	Presentations (demonstration of information on the subject of lectures)			40

5. EVALUATION BY THE EDUCATIONAL COMPONENT

5.1. Diagnostic assessment (specified as necessary)

5.2. Summative assessment

5.2.1. To assess the expected learning outcomes, it is provided

No	Methods of summative assessment	Points / Weight in the overall assessment	Compilation date
Module 1 (35 points):			
1	Protection of practical works	10 points / 10%	within 5 days after the class
2	Intermediate testing (multiple choice test)	25 points / 25%	Until the 15th week
Module 2 (35 points):			
4	Protection of practical works	5 points / 5%	within 5 days after the class
5	Intermediate testing (multiple choice test)	30 points / 30%	Until the 15th week
6	Exam (multiple choice test)	30 test questions, each worth 1 points	Until the 15th week
Unformal education			
7	Completion of training on Prometheus	20 points / 20%	Until the 15th week

5.1.1. Evaluation criteria

Component	Unsatisfactorily	Satisfactorily	Good	Perfectly
		<0 points	1 points	1,5 points
Protection of practical works	Task requirements not met	Most of the requirements are met, but individual components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All requirements of the task have been fulfilled	All the requirements of the task were fulfilled, creativity, thoughtfulness was demonstrated, and an own solution to the problem was proposed
Module 1 (35 points):				
1	Protection of practical works	4 practical works, each evaluated for a 2,5 points (10 points)	within 5 days after the class	

2	Intermediate testing (multiple choice test)	25 test questions, each worth 1 point	Until the 7th week
Module 2 (35 points):			
4	Protection of practical works	Two practical works, each evaluated for 2,5 points (5 points)	within 5 days after the class
5	Intermediate testing (multiple choice test)	30 test questions, each worth 1 points	Until the 15th week
6	Exam (multiple choice test)	30 test questions, each worth 1 points	Until the 15th week
Unformal education			
7	Completion of training on Prometheus	Obtaining a certificate and its identification by a reliable link (20 points)	Until the 15th week

5.2. Formative assessment:

To assess the current progress in learning and understand the directions for further improvement is provided

No	Elements of formative assessment	Date
1	Oral examination after studying all topics, during laboratory classes	within 5 days after the class
2	Feedback in the form of discussion of final testing	7, 15 week
3	Feedback in the form of discussion of examination testing	15 week
4	Feedback in the form of a discussion of the informal education course	after listening to the course

6. EDUCATIONAL RESOURCES (LITERATURE)

Recommended Books

Methodical

- Helikh A.O.** Methodology and technology of scientific information processing. Course of lectures for postgraduate students of specialty 181 "Food technologies" of full-time and correspondence forms of study // Sumy: SNAU, 2024, 97 p.
- Helikh A.O.** Methodology and technology of scientific information processing. Methodical recommendations for laboratory classes for graduate students of specialty 181 "Food technologies" of full-time and part-time study // Sumy: SNAU, 2024, 62 p.

Basic

- Helikh A.O., Samilyk M.M.** Patent for the invention "Pasta based on freshwater molluscs" No. 124558. Application number a 2019 11513. IPC A23L (17/50) (2016.01). Bull . 40, 10.06.2021. P.5.
- Helikh A.O., Samilyk M.M.** Patent for the invention "Method of production of A2 drinking milk" No. 127490. Application number a202006473. A23C3/02, A23L33/19. Bull . 36, 09/06/2023. P.5.
- Helikh A.O.** Patent for the utility model "Method of production of craft sauce "Mayonnaise enriched with selenium"" No. 146036. Application number A 2020 06233. IPC A23L (27/60) (2016.01). Bull . 3, 20.01.2021. P.4.
- Helikh A.O.** Utility model patent "Method of production of Selenium-enriched Ketchup craft sauce " No. 146035. Application number A 2020 06239. IPC A23L (27/60) (2016.01). Bull . 3, 20.01.2021. P.4.

8. **Helikh A.O.** Patent for the utility model "Method of obtaining cooked and frozen meat of *Achatina giant*" No. 155107. Application number u 2023 02883. IPC A23L (5/10) (2016.01). Bull . 3, 17.01.2024. P.4.

9. Konverskyi A.E. Basics of methodology and organization of scientific research: teaching . help for students, cadets, graduate students and adjuncts / edited by A.E. Konversky . - K.: Center for Educational Literature, 2019. - 352 p.

10. Korbutyak V.I. System approach and scientific research methodology: study guide / V.I. Korbutyak . – Rivne: NUVHP, 2019 . - 176 p.

11. Kremin V. Education and science in Ukraine - innovative aspects. Strategy. Realization. The results. - K.: Gramota, 2019. - 488 p.

12. Fundamentals of methodology and organization of scientific research: Training . help for students, cadets, graduate students and adjuncts / edited by A. E. Konverskyi . — K.: Center of Educational Literature, 20 2 0. — 352 p

13. The procedure for passing documents for the defense of theses in the specialized academic councils of the Lviv Polytechnic National University: methodological guidelines / Yu. Ya. Bobalo , Ya. T. Lutsik, B. I. Stadnyk, I. O. Shishkina. – Lviv: Lviv Polytechnic, 2019. – 141 p.

14. Romanchikov V.I. Basics of scientific research: Education . manual. - K.: Center of educational literature, 2019. - 254 p. 12.

15. For those who pave their way to science: Study guide / M.G.Nakhodkin , A.G.Naumovets , S.M.Ryabchenko . – K.: VOC "Kyiv University", 2019. -239 p.

16. Fedorchenko Yu. About the phenomenon of the dissertation and the awarding of scientific degrees: published on 23.06.2019 // Electronic resource: <http://education-ua.org/ua/articles/1207-phenomenon-disertatsiji-ta-prisudzheniya-naukovikh-stupeniv>

17. Filipenko A.S. Basics of scientific research: Synopsis of lectures. - K.: Akademvydav , 2019. -208 p.

18. Tsekhmistrova G.S. Basics of scientific research: Education . manual. - K.: Ed. House "Slovo", 2019. -240 p.

Information resources

19 . <https://cdn.snau.edu.ua/moodle/course/view.php?ID=4351>