

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Department of Food Technology and Safety

Work program (syllabus) of the educational component

**EC 10 Processing methods and technology
scientific information**

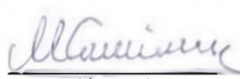
Specialty	181 "Food Technology"
Educational program	Food technology
Level of higher education	Third (educational and scientific)

Developer:



Anna HELIKH Candidate of Technical Sciences,
Associate Professor, Department of Food Technology and
Safety

(sumame, initials) (academic degree and title, position)

Reviewed and approved at the meeting of the Department of Food Technology and Safety (name of department)	protocol dated <u>12.06.2026</u> year <u>Ne 16</u>
	Manager departments  <u>Marina SAMILYK</u> (signature) (last name, initials)

Agreed:

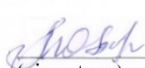
Guarantor of the educational program  Oksana MELNYK
was provided fiil s week (signature) (full name)

Acting Dean of the Faculty where the educational program is implemented was provided by

 Nataliia BOLHOVA
(signature) (full name)

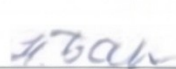
The review of the work program

was provided by

 Ph.D., Assoc. Prof. Oksana MELNYK
(signature) (full name)
 Doctor of Engineering Sciences, Prof. Fedir PERTSEVOY
(signature) (full name)

Methodologist of the Department of Educational Quality,

licensing and accreditation

 (Hryhorii KOPANYCH)
(signature) (full name)

Registered in the electronic database: date: 07.07.2026 year.

Information on reviewing the work program (syllabus):

[illegible]

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name EC	EC 10 Processing methods and technology scientific information		
2.	Faculty/department	Food Technology / Department of Food Technology and Safety		
3.	Status EC	Elective		
4.	Program/Specialty (programs) that include EC for (<i>filled in for mandatory EC</i>)	EP "Food Technologies", 181 Food Technologies		
5.	NRC level	8th level		
6.	Semester and duration of study	4th semester, 15 weeks		
7.	Number of ECTS credits	3		
8.	Total hours and their distribution	Contact work (classes)		Independent work
		Lectures 20	Practical 20	110
9.	Language of instruction	English		
10.	Teacher/Educational Component Coordinator	Ph.D., associate professor Helikh A.O.		
11.1	Contact information	Anna Oleksandrivna Helikh, Associate Professor of the Department of Technology and Safety, 317a, e - mail : anna . helikh @ snau . edu . ua		
11.	General description of the educational component	formation in higher education applicants knowledge, skills and abilities in collecting and processing scientific information.		
12.	Purpose of the educational component	-providing theoretical and practical knowledge to students on the acquisition of methodology and technology of scientific information processing; -determining the main issues and tasks of scientific processing; -providing practical knowledge of mathematical and statistical methods of processing scientific information.		
13.	Prerequisites for studying MC, connection with other educational components of EP	The educational component is the basis for the OP "Food Technologies": MC 6 Organization of preparation of scientific publications and writing of dissertations .		
14.	Keywords	Processing of scientific information, methodology of scientific research, preparation of articles, preparation of patents and results of scientific research		
15.	Academic Integrity Policy	It is not allowed to copy the conclusions of the laboratory work protocols from each other, in such a case the laboratory work will be considered unprotected and will require re-revision. In case of re-revision, the work will not be evaluated for the maximum score .		
16.	Course link	https://cdn.snau.edu.ua/moodle/course/view.php?id=5649		

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

Learning outcomes for EC: After studying the educational component, the student is expected to be able to...	Program learning outcomes that the EC aims to achieve				How is RND assessed?
	1	2	3	12	
<u>DRN 1</u> Demonstrate a deep understanding of key concepts, categories, and principles of scientific research methodology. Ability to structure scientific research, select and justify adequate theoretical and empirical methods, and appropriately format and present the results of scientific research in accordance with modern standards.	X	X	X	X	Oral defense of practical work Multiple-choice final test (modular assessment) Exam
<u>DRN 2</u> Analyze and justify ways to implement the results of scientific research into practical activities or further scientific circulation. Ability to develop criteria and methods for assessing scientific novelty, practical significance, and economic or social effectiveness of research results.	X		X		Oral defense of practical work Multiple-choice final test (modular assessment) Exam
<u>DRN 3.</u> Effectively communicate the results of scientific research in various forms (publications, reports, discussions) for professional and general audiences, adhering to the principles of academic integrity and scientific ethics. Plan and manage scientific research projects, taking into account resource and time constraints.					Oral defense of practical work Multiple-choice final test (modular assessment) Exam
LIST OF COMPETENCES THAT WILL BE IMPROVED/ACQUIRED IN THE PROCESS OF NON-FORMAL EDUCATION					
Design Thinking for Innovation					
General: the presence of an innovative perception of the subject, specified in three types: perception of one's own innovations and innovations or discoveries in general, the ability to see elements of the new in the relatively stable, and the ability to propose a fundamentally new solution to the problem. Professional: possession of a system of theoretical and practical knowledge, a set of skills; experience in demonstrating competence in real situations during scientific research; the ability to creatively solve professional problems, the level of awareness of the technologist of his knowledge, abilities, skills, and capabilities necessary for the qualified implementation of innovative activities.				Form for confirming learning results: A certificate of successful completion of training with the number of hours. The authenticity of the certificate can be verified by using the link on it.	

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be addressed within the topic	Distribution within the overall time budget			Recommended reading ¹
	Classroom work		CRC	
	Luke	Software		
Module 1				
Lecture 1. Scientific research . 1. Specificity of scientific and everyday knowledge 2. Issues of scientific research 3. Choosing a topic and implementing scientific research 4. Evaluation of the effectiveness of scientific research	2			[1, 10,14]
Practical lesson 1 . <i>Creation of a database of scientific literary sources</i>		2		[2, 11,17]
Independent work 1. Procedure for conducting scientific research research. Concept, functions and structure of a research program 2. Sequence and stages of implementation scientific research			10	[1,2, 18]
Lecture 2. Research technology in food industry (part 1) 1. The main stages of scientific research 2. Formulation of the research problem	2			[1, 19]
Practical lesson 2 . <i>Creation of a database of patents for inventions and utility models</i>		2		[2, 13,14]
Independent work 3. Economic justification of the choice scientific topic 4. Search, accumulation and processing scientific information			10	[1,2, 17]
Lecture 3. Research Technology in food industry (Part 2) 3. Working on a scientific research hypothesis 4. Conducting research and forming a scientific theory	2			[1,13]
Practical lesson 3. <i>Evaluating the statistical characteristics of measurements</i>		2		[2, 19]

¹ Specific source from the main or additionally recommended literature

Independent work 1. The essence of the experiment, general requirements for conducting it 2. Classification of experiments			10	[1,2, 16]
Lecture class 4. Levels and methods of scientific research (part 1) 1. Levels of scientific research 2. Methods of theoretical level of scientific research	2			[1, 11]
Practical lesson 4. <i>Patent research report</i>		2		[2, 12]
Independent work 1. Stages of preparing a scientific experiment 2. Classical planning methodology experimental research			10	[1,2, 15]
Lecture class 5. Levels and methods of scientific research (part 2) 1. Methods of empirical and theoretical levels of research 2. Methods of empirical level of scientific research	2			[1, 10,14]
Practical lesson 5. Methods of writing a scientific article		2		[2, 3,4,11,17]
Independent work 1. General characteristics of processes scientific research. Technology of scientific activity 2. Structure of scientific research 3. Reporting results scientific work			10	[1,2, 18]
Total for module 1	10	10	50	

Module 2				
<i>Lecture 6. Design, implementation and evaluation of scientific research results in food industry</i> 1. Types of student research papers and general requirements for their design. 2. Requirements for the structure and design of dissertations and abstracts 3. Features of R&D implementation and preparation of their reporting documentation 4. Approbation of scientific research results	2			[1, 10,14]
<i>Practical lesson 5.</i> Working with scientometric databases: searching for relevant information, analyzing publication activity. Practical mastering of the functionality of bibliography management systems.		2		[2, 11,17]
<i>Independent work:</i> 1. A detailed study of the capabilities of one of the statistical data processing packages for analyzing research results in the food industry. 2. Ethics of using software in scientific research: licensing, code plagiarism.			10	[1,2, 18]
<i>Lecture 7. Fundamentals of scientific fundraising and preparation of project applications.</i> 1. Overview of the main national and international funds (NFDU, Horizon Europe, Erasmus+, etc.) that finance research in food technology. 2. Structure of a typical grant proposal: justification of relevance, goal, objectives, methodology, expected results, budget. 3. Criteria for evaluating project applications. 4. Search for partners and formation of a consortium for scientific projects.	2			[1, 11]
Practical session 7. Developing key components of a grant application.		2		[2, 19]

Independent work 1. Detailed analysis of priority areas of research funding in the field of food technology (using the example of one national and one international fund, e.g., NFDU and Horizon Europe – Cluster 6). 2. Critical analysis of the structure and content of 2-3 Project Summaries of successfully funded projects on topics relevant to the dissertation research.			14	[1,2, 16]
<i>Lecture 8. Commercialization of scientific results: grants, technical documentation and industry recommendations.</i> 1. Fundamentals of scientific fundraising and preparation of grant proposals: overview of key funds (NFDU, Horizon Europe), structure and criteria for evaluating project applications. 2. Methodology for developing recommendations for industry: transforming scientific findings into practical advice for implementation. 3. Development of technical documentation (TU, TI) for new types of food products as a tool for implementing the results of the dissertation. 4. Formulation of author's conclusions for business and intellectual property protection strategy (in addition to patents).	2			[1, 10,14]
Practical session 8. Workshop on developing a grant proposal and draft recommendations for industry.		2		[2, 11,17]
Independent work: 1. A detailed study of one of the software tools for meta-analysis. 2. Critical analysis of a published systematic review or meta-analysis in the field of food technology.			16	[1,2, 18]
<i>Lecture 9. Technologies for preparing and presenting scientific results for testing and defense in food industry.</i> 1. Structure and features of preparing a dissertation abstract. 2. Methodology for preparing scientific reports and presentations for conferences and seminars (use of modern presentation technologies). 3. Technology for preparing a response to the comments of reviewers and opponents. 4. Public defense of the dissertation: procedure, requirements, typical questions.	2			[1, 19]

Practical lesson 9. Development of the structure and key theses of the presentation for the defense of scientific work (based on the materials of the postgraduate student). Modeling answers to typical questions.		2		[2, 5,6,19]
Independent work: 1.Detailed analysis of the tender documentation (Call for proposals) of one current competition (for example, the National Research Foundation of Ukraine or Horizon Europe), which corresponds to the topic of the dissertation research. 2. Study of the regulatory framework and requirements for the development, approval and registration of Technical Specifications (TS) for new types of food products in Ukraine.			16	[1,2, 16]
Lecture 10. Scientific reputation management and promotion of research results in the digital environment. 1. Modern tools for tracking citations and scientific impact (Google Scholar Citations, Scopus Author ID, ResearcherID, ORCID). 2. Using professional social networks for scientists (ResearchGate, Academia.edu) to disseminate results. 3. Principles of Open Access and its role in the dissemination of scientific information. 4. Strategies for increasing the visibility of scientific publications and personal scientific brand.	2			[1, 10,14]
Practical session 10. Creation and optimization of scientist profiles in key scientometric and professional networks. Analysis of tools for visualizing scientific contribution.		2		[2, 11,17]
Independent work: 1. Research the open access policies of leading publishers and foundations in the field of food sciences. 2. Development of an individual strategy for promoting one's own scientific results.			14	
Total for module 2	10	10	60	

Non-formal education (Prometheus)				
Design Thinking for Innovation Course program: The course is divided into five parts: What is design thinking? Preparing the mind for innovation Generating ideas Experimentation Final assignment Analysis tools How to conduct research and draw conclusions How to prioritize Developing recommendations	5			https://prometheus.org.ua/course/course-v1:Prometheus+DTI101+2017_T3
Total	20	20	110	

4. TEACHING AND LEARNING METHODS

[illegible]

DRN 2 Analyze and justify ways to implement the results of scientific research into practical activities or further scientific circulation. Ability to develop criteria and methods for assessing scientific novelty, practical significance, and economic or social effectiveness of research results.	Problem lectures (questions are raised regarding the material covered by the teacher, but the lecturer answers them himself, to focus students' attention on the main point) Presentations (demonstration of information on the topic of lectures)	6	Practical classes (performing tasks according to the methodological instructions) Brainstorming during practical work Individual tasks (independent processing of the information proposed by the teacher)	6 30
DRN 3. Effectively communicate the results of scientific research in various forms (publications, reports, discussions) for professional and general audiences, adhering to the principles of academic integrity and scientific ethics. Plan and manage scientific research projects, taking into account resource and time constraints.	Problem lectures (questions are raised regarding the material covered by the teacher, but the lecturer answers them himself, to focus students' attention on the main point) Presentations (demonstration of information on the topic of lectures)	8	Practical classes (performing tasks according to the methodological instructions) Brainstorming during practical work Individual tasks (independent processing of the information proposed by the teacher)	8 40

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
Module 1 (35 points):			
1	Defense of practical works	5 points / 5%	within 5 days after class
2	Midterm testing (multiple choice test)	30 points / 30%	By week 7
Module 2 (35 points):			
3	Defense of practical works	5 points / 5%	within 5 days after class
4	Midterm testing (multiple choice test)	30 points / 30%	By week 15
5	Exam	30 points / 30%	By week 15
Informal education			
6	Completion of training on Prometheus	5 points / 5%	By week 15

5.1.1. Evaluation criteria

<i>Component</i>	<i>Unsatisfactorily</i>	<i>Satisfactorily</i>	<i>Good</i>	<i>Perfectly</i>
	<i>< 0 points</i>	<i>0.5 points</i>	<i>0.8 ball</i>	<i>1.0 point</i>
Defense of practical works	<i>Task requirements not met</i>	<i>Most requirements are met, but individual components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue</i>	<i>All task requirements met</i>	<i>Fulfilled all the requirements of the task, demonstrated creativity, thoughtfulness, proposed their own solution to the problem</i>
Module 1				
1	Defense of practical works	5 practical assignments, each worth 1 point (subject to completion)		within 5 days after class
2	Midterm testing (multiple choice test) for Module 1	30 test questions, each worth 1 point		By week 7
Module 2				
3	Defense of practical works	5 practical assignments, each worth 1 point (subject to completion)		within 5 days after class
4	Midterm testing (multiple choice test) for Module 2	30 test questions, each worth 1 point		By week 15
5	Exam	30 test questions, each worth 1 point		By week 15
Informal education				
6	Completion of training on Prometheus	Obtaining a certificate and identifying it through a reliable link is rated at 5 points.		By week 15

5.2. Formative assessment:

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

No.	Elements of formative assessment	Date
1	Oral survey after studying all topics, during practical classes	within 5 days after class
2	Feedback in the form of a discussion of the final testing	7, 15 weeks
4	Feedback in the form of a discussion of the VTS of the non-formal education course	after listening to the course, up to week 15

6. LEARNING RESOURCES (LITERATURE)

Recommended reading

Methodical

1. **Gelikh A.O.** Methods and technology of scientific information processing. Course of lectures for postgraduate students of specialty 181 "Food Technologies" of full-time and part-time forms of study // Sumy: SNAU, 2024, 97 p.

2. **Gelikh A.O.** Methods and technology of scientific information processing. Methodological recommendations for laboratory classes for postgraduate students of specialty 181 "Food Technologies" of full-time and part-time forms of study // Sumy: SNAU, 2024, 62 p.

Basic

3. Helikh A.O., Samilyk M.M. Patent for the invention "Pasta based on freshwater mollusks" No. 124558. Application number a 2019 11513. MPK A23L (17/50) (2016.01). Bull. 40, 10.06.2021. P.5.
4. Method for producing isoprotein. Patent for invention (2024) No. 129068. Application number a202202907 dated 08/12/2022.
5. Helikh A.O., Samilyk M.M. Patent for the invention "Method of producing A2 drinking milk" No. 127490. Application number a202006473. A23C3/02, A23L33/19. Bull. 36, 06.09.2023. P.5.
6. Helikh A.O. Patent for a utility model "Method of producing Kraft sauce "Mayonnaise enriched with selenium"" No. 146036. Application number a 2020 06233. MPK A23L (27/60) (2016.01). Bull. 3, 01.20.2022. P.4.
7. Helikh A.O. Patent for a utility model "Method for producing craft sauce "Ketchup enriched with selenium"" No. 146035. Application number a 2020 06239. MPK A23L (27/60) (2016.01). Bull. 3, 01.20.2022. P.4.
8. Helikh A.O. Patent for a utility model "Method of obtaining boiled-frozen meat of Achatina giant" No. 155107. Application number u 2023 02883. MPK A23L (5/10) (2016.01). Bull. 3, 17.01.2024. P.4.
9. Konversky A.E. Fundamentals of methodology and organization of scientific research: a manual for students, cadets, postgraduates and assistants / edited by A.E. Konversky. – K.: Center for Educational Literature, 2023. – 352 p.
10. Korbutyak V.I. Methodology of the system approach and scientific research: a textbook / V.I. Korbutyak. – Rivne: NUVGP, 2023. – 176 p.
11. Kremin V. Education and science in Ukraine - innovative aspects. Strategy. Implementation. Results. – Kyiv: Gramota, 2023. – 488p.
12. Fundamentals of methodology and organization of scientific research: Textbook for students, cadets, postgraduates and assistants / edited by A. E. Konversky. — Kyiv: Center for Educational Literature, 2023. — 352 p.
13. The procedure for passing documents for the defense of dissertations in specialized academic councils of the National University "Lviv Polytechnic": methodological instructions / Yu. Ya. Bobalo, Ya. T. Lutsyk, B. I. Stadnyk, I. O. Shyshkina. – Lviv: Lviv Polytechnic, 2022. – 141 p.
14. Romanchykov V.I. Fundamentals of scientific research: Textbook. - K.: Center for Educational Literature, 2022. - 254 p. 12.
15. For those who pave their way into science: Textbook / M.G. Nakhodkin, A.G. Naumovets, S.M. Ryabchenko. – Kyiv: VPC 'Kyiv University', 2023. -239 p.
16. Fedorchenko Y. On the phenomenon of dissertation and awarding scientific degrees: published 06/23/2022 // Electronic resource: <http://education-ua.org/ua/articles/1207-pro-fenomen-disertatsiji-ta-prisudzhennya-naukovikh-stupenyiv>
17. Filipenko A.S. Fundamentals of Scientific Research: Lecture Notes.- K.: Akademvydav, 2023.- 208 p.
18. Tsekhmistrova G.S. Fundamentals of scientific research: Textbook. - K.: Publishing House "Slovo", 2023. - 240 p.

Information resources

<https://cdn.snau.edu.ua/moodle/course/view.php?id=5649>

