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

Syllabus of the educational component

MC 8 Innovative technologies in enterprises of the industry
(optional)

Implemented within the educational program **EP "Food Technology"**
(name)

by specialty 181 Food Technology
(code, name)

at **the second (master's)** level of higher education

Sumy - 2024

Developer: **Melnik O, Ph.D., head of Technologies of Nutrition Department, Associate Professor**

Considered, approved at the meeting of Technologies of Nutrition Department (name of the department)	protocol from 31.05.24 № 19
	(signature) **Oksana Melnyk** (surname, initials)

Agreed:

Guarantor of the educational program (signature) Fedir Pertsevoy (full name)

Dean of the faculty where the educational program is implemented (signature) Nataliia Bolhova (full name)

A review of the work program (attached) is provided: (signature) Nataliia Bolhova

Olena KOSHEL

Methodist of the Department of Education Quality, licensing and accreditation (signature) (Nagile Bakaeva) (full name)

Registered in the electronic database, date: 27.06. 2024.

Informationon reviewing the work program(syllabus):

Academic year in which changes are made	The number of the appendix to the work program with a description of the changes	The changes have been reviewed and approved		
		Date and number of the minutes of the meeting of the department	Head of Department	Guarantor of the educational program

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name EC	Innovative technologies in enterprises of the industry		
2.	Faculty / department	Food technology/Technologies of nutrition		
3.	Status EC	Obligatory		
4.	Program / Specialty (programs), the component of which is EC for	EP "Food Technology", 181 Food Technology		
5.	NRC level	7 level		
6.	Semester and duration of study	1-2 semester 30 weeks		
7.	Number of ECTS credits	10		
8.	The total number of hours and their distribution	Contact work (classes)		Individual work
		Lectures	Laboratory	
		4	34	262
9.	Language of instruction	English		
10.	Teacher /Coordinator of the educational component	Ph.D., Associate Professor Oksana Melnyk		
11.	Contact Information	oksana.melnyk@snau.edu.ua oxana7@i.ua		
12.	General description of the educational component	Training of future specialists who are acquainted with the following important problems and issues of food technologies: innovative technologies and their use in food enterprises and restaurants; main directions and methodical approaches to designing innovative food products and diets; improvement and development of innovative food technologies on the basis of the latest achievements of science and technology; study of patterns of formation of the range of food and culinary products, determination of development prospects; mastering knowledge of the scientific principles of food rations, taking into account the introduction of innovative food technologies.		
13.	The purpose of the educational component	Expansion and deepening of students 'knowledge of the current state and prospects of nutrition, scientific substantiation of the use of innovative methods of raw material processing, students' mastery of theoretical and practical skills and their implementation during the design of the latest food and culinary products; the ability to diagnose food technologies as integrated technological systems aimed at improving existing and developing more effective innovative technologies; ability to determine the features and dynamics of transformation of innovative food enterprises and restaurants in accordance with today's requirements.		
14.	Prerequisites for studying EC, the relationship with other educational components of EP	The educational component is related to other educational components "Scientific research work", "Food Quality Management", "Innovative Engineering"		

15.	The policy of academic integrity	For violation of the rules of academic integrity, the student will be held liable for such a form as: - re-taking the exam. - it is not allowed to copy the conclusions of the protocols of laboratory works from each other, in this case the laboratory works will be considered unprotected and need to be revised. In case of repeated refinement, the work will not be evaluated for the maximum score; -when writing the final tests it is not allowed to write off students from each other and use gadgets, if this happens, then the reduction of points is provided.
16.	Course link in Moodle system	https://cdn.snau.edu.ua/moodle/course/view.php?id=3695

2. LEARNING RESULTS FOR THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH THE SOFTWARE LEARNING RESULTS

Learning outcomes of the discipline	Program learning outcomes									How is the learning outcome of the discipline assessed
	2	4	6	8	9	10	11	13	15	
1. Knowledge of the current state and prospects for the development of nutrition science; innovative methods of processing raw materials; the newest functional food products.						+				*Assessment of knowledge by checking the elaboration of the reference syllabus of lectures and laboratory classes* *Exam* *Computer testing*
2.Knowledge for optimization in the development of scientific and technical projects, application of the basic principles of obtaining innovative food products from various types of raw materials, taking into account the social and economic efficiency of scientific development.		+				+		+		
3. Knowledge of zero-waste technologies and new ways of canning and storing food products, organizing the work of enterprises in accordance with the requirements of life safety, resource conservation and environmental safety.									+	
4.The ability to demonstrate initiative and ingenuity during the development and implementation of technical and technological innovations,	+			+	+					

to present the results of one's activities, to present the results of one's research in the form of scientific reports, articles, theses of scientific conferences.										
5. The ability to diagnose the technologies of food and culinary products as integral technological systems aimed at improving existing and developing more effective innovative technologies, managing the quality and safety of food products. The ability to design the composition of food products, develop and implement innovative technological solutions, technologies for the production, storage and canning of semi-finished products and finished products.			+				+			

3. CONTENT OF THE EDUCATIONAL COMPONENT (PROGRAM OF THE COURSE)

Subject. List of issues to be addressed within the topic	Distribution within the general budget of time			Recommended Books
	Classroom work		Individual work	
	LC	Lab		
Autumn semester				
Topic 1. Introduction. Subject and tasks. Innovations in the food industry. Plan 1. Tasks of the discipline, its content. 2. Innovations in the food industry..	-	-	25	[6, 8, 15]
Topic 2. Breakthrough innovations in the food industry of the future. Plan 1. Bioinformatics and food design. 2. Alternative sources of protein.. 3. Technology of canning and extending the shelf life of food.	1	-	25	[6, 8]
Topic 3. Technological innovations in the food industry. Plan				

1. Development and implementation of raw material storage technologies. 2. The use of resource-saving technologies, which are characterized by the most useful yield of finished products and a minimum of waste. 3. Improvement of containers, packaging and methods of transportation.	1	4	25	[12, 15]
Topic 4. Innovative food ingredients. Plan 1. General classification and characteristics of food ingredients. 2. Dietary fiber, their characteristics and properties. 3. Algae and products of their processing. 4. BASs	-	-	25	[2, 4, 5]
Topic 5. Innovations in restaurants. Plan 1. The most common innovations in the restaurant industry. 2. Fashion in the names of dishes. Presentation of dishes and the concept of the institution: domestic and foreign experience. 3. Innovative approaches to creating menus. 4. Molecular cuisine.	-	4	22	[3, 8, 9, 11]
Topic 6. Modern foundations of nutrigenomics. Plan 1. Modern scientific views on human needs for essential and non-essential nutrients. 2. Energy value of food.	-	-	20	[13, 14]
Topic 7. Modern aspects of nutrition and scientific-practical and methodological approaches to the design of functional foods Plan. 1. The external environment, food quality and public health. 2. Scientific-practical and methodological approaches to the design of functional foods.	-	4	20	[18, 19]
Topic 8. The concept of functional nutrition. Plan 1. Classification and characterization of food products for functional purposes. 2. The concept of functional nutrition. Characteristics of functional foods.	-	4	20	[4, 18, 19]
	2	16	182	
Spring semester				
Topic 9. Innovative technologies and quality of functional foods (1). Plan 1. Innovative technologies of restaurant products. 2. Technology of cold appetizers, dishes and culinary products using dietary supplements, creative trends and molecular technologies. 3. Technology of sauces and soups (including eintopf) with the use of dietary supplements, creative trends and molecular technologies.	1	-	20	[20, 21]
Topic 10. Innovative technologies and quality of functional foods (2). Plan 1. Technology of meat dishes, meat products and poultry with the use of innovative technologies.				

2. Technology of milk dishes and dairy products with the use of innovative ingredients, technologies of processing and storage of dairy products. 3. Substantiation of conditions and sale of finished products; requirements for the quality of finished products.	1	6	20	[20, 21]
Topic 11. Innovative technologies and quality of functional foods (3). Plan 1. Technology of desserts and drinks with the use of dietary supplements, non-traditional raw materials, creative trends and molecular technologies. 2. Justification of conditions and sales of finished products; requirements for the quality of finished products.	-	6	20	[20, 21]
Topic 12. Innovative technologies and quality of functional foods (4). Plan 1. Technology of flour and flour confectionery products with the use of dietary supplements, extrusion and low-temperature technologies. 2. Justification of conditions and sales of finished products; requirements for the quality of finished products.	-	6	20	[20, 21]
	2	**18**	**80**	
Total	**4**	**34**	**262**	

4. METHODS OF TEACHING AND LEARNING

Learning outcomes of the discipline	**Teaching methods** (work to be done by the teacher during classes, consultations)	**Number of hours**	**Teaching methods** (what types of educational activities the student must performing dependently)	Number of hours
1. Knowledge of the current state and prospects for the development of nutrition science; innovative methods of processing raw materials; the newest functional food products.	Lecture (teaching lecture material, conversation, demonstration of graphic material)	10	Acquaintance with lecture material, registration of the basic synopsis of lectures. Presentation of decisions and preparation of abstracts, reports with visual support	50
2.Knowledge for optimization in the development of scientific and technical projects, application of the basic principles of obtaining innovative food products from various types of raw materials, taking into account	Lecture (teaching lecture material, conversation, demonstration of graphic material)	10	Acquaintance with lecture material, registration of the basic synopsis of lectures. Presentation of decisions and preparation of abstracts, reports with visual support	50

the social and economic efficiency of scientific development.				
3. Knowledge of zero-waste technologies and new ways of canning and storing food products, organizing the work of enterprises in accordance with the requirements of life safety, resource conservation and environmental safety.	Laboratory lesson (consideration of technological situations with the provision of recommendations for solving technological problems of production)	10	Presentation of the results of laboratory classes, preparation of reports	50
4.The ability to demonstrate initiative and ingenuity during the development and implementation of technical and technological innovations, to present the results of one's activities, to present the results of one's research in the form of scientific reports, articles, theses of scientific conferences.	Lecture (teaching lecture material, conversation, demonstration of graphic material)	4	Presentation of the results of laboratory classes, preparation of reports	50
5. The ability to diagnose the technologies of food and culinary products as integral technological systems aimed at improving existing and developing more effective innovative technologies, managing the quality and safety of food products. The ability to design the composition of food products, develop and implement innovative technological solutions, technologies for the production, storage and canning of semi-finished products and finished products.	Lecture (teaching lecture material, conversation, demonstration of graphic material)	4	Acquaintance with lecture material, registration of the basic synopsis of lectures. Presentation of decisions and preparation of abstracts, reports with visual support	62

5. EVALUATIONBY EDUCATIONAL COMPONENT

5.1. Summative assessment

5.1.1. To assess the expected learning outcomes provided

№	Methods of summative evaluation	Points / Weight in the overall score	Date of compilation
	Autumn semester		
	Module 1 (50 points)		
1.	Intermediate testing	25 points /25%	By the end of the 7th week
2.	Performance and protection of laboratory work	25 points /25%	Follow 1-7 week
	Module 2 (50 points)		
4.	Intermediate testing	25 points /25%	By the end of the 14th week
5.	Performance and protection of laboratory work	25 points /25%	Follow 8-14 week
	Spring semester		
	Module 1 (25 points)		
	Intermediate testing	10 points / 10%	By the end of the 8th week
	Performance and protection of laboratory work	15 points / 15%	During the lesson
	Module 2 (45 points)		
	Intermediate testing	10 points / 10%	Until the end of the 14th week
	Performance and protection of laboratory work	15 points / 15%	During the lesson
	Presentation of the task on the given topic	20 points / 20%	Until the end of the 14th week
	The exam is a written answer to the question on the ticket	30 points / 30%	Until the end of the 16th week

5.1.2. Evaluation criteria

Component	*Unsatisfactorily*	*Satisfactorily*	*Okay*	*Perfectly*
Written test on theoretical material	*<15 points*	*16-19 points*	*20-24 points*	*25 points*
	The test includes 10, 20, 25 questions, each of which is worth 1 point			
Execution and protection of laboratory works	*<12 points*	*12-15 points*	*15-18 points*	*20 points*
	Task requirements not met	Answers to all questions are given, but some components of the answers are missing or insufficiently disclosed, there is no analysis of other approaches to the question	The answers to all questions are given	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Written test on theoretical material	*<5 points*	*6-7 points*	*8-9 points*	*10 points*
	The test includes 10, 20, 25 questions, each of which is worth 1 point			
Execution and protection of laboratory works	*<10 points*	*11-12 points*	*13-14 points*	*15 points*
	Task requirements not met	Answers to all questions are given, but some components of the answers are missing or	The answers to all questions are given	Answers to all questions are given, creativity, thoughtfulness is shown, own solution of a problem is

		insufficiently disclosed, there is no analysis of other approaches to the question		offered
Completion of the task according to the given topic	*<10 points*	*11-15 points*	*16-19 points*	*20 points*
	Task requirements not met	Answers to all questions are given; but some components of the answers are missing or insufficiently disclosed, there is no analysis of other approaches to the question	The answers to all questions are given	Answers to all questions are given, creativity, thoughtfulness is shown, own solution of a problem is offered
Exam - a written answer to the ticket	*<20 points*	*21-24 points*	*25-28 points*	*29-30 points*
	Task requirements not met	Answers to all questions are given, but some components of the answers are missing or insufficiently disclosed, there is no analysis of other approaches to the question	The answers to all questions are given	Answers to all questions are given, creativity, thoughtfulness is shown, own solution of a problem is offered

5.2. Evaluation criteria

To assess current progress in learning and understanding areas for further improvement

№	Elements of formative assessment	Date
	Autumn semester	
1	*Written knowledge control after studying topics 1-7*	*7 week*
2	*Written knowledge control after studying topics 8-15*	*14 week*
3	*Oral interview during each laboratory lesson* *Feedback in the form of written protocols of laboratory works (4 pieces)*	*For 1-14 weeks*
4	*Feedback from the teacher in preparation for certification*	*8 week*
5	*Feedback from the teacher while working on the abstract*	*14 week*
	Spring semester	
1	*Written knowledge control after studying topics 1-7*	*7 week*
2	*Written knowledge control after studying topics 8-15*	*14 week*
3	*Oral interview during each laboratory lesson* *Feedback in the form of written protocols of laboratory works (4 pieces)*	*For 1-14 weeks*
4	*Feedback from the teacher in preparation for certification*	*8 week*
5	*Feedback from the teacher while working on the abstract*	*14 week*

6. EDUCATIONAL RESOURCES (literature)

Basic

1. Developing Technologies in Food Science: Status, Applications, and Challenges / Murlidhar Meghwal, Megh R. Goyal // Waretown. Apple Academic Press Inc. 2017. P. 421.

2. Engineering Properties of Foods / M. A. Rao, Syed S. H. Rizvi, Ashim K. Datta, Jasim Ahmed // New York. CRC Press. 2022. P. 769.

3. Food Quality Assurance. Principles and Practices / Inteaz Alli // New York. CRC Press. 2023. P. 154 http://www.thanutswu.com/images/BOT331/food%20quality%20assurance.pdf

4.Law of Ukraine "On the quality and safety of food products and food raw materials".

5.Law of Ukraine "On Protection of Consumer Rights"

6.DSTU 4161-2003 «Food safety management systems».

7.DSTU ISO 9000-2001 «Quality management systems. Basic Provisions and Dictionary».

8.DSTU ISO 9001-2001 «Quality management systems. Requirements».

9.DSTU ISO 9004-2001 « Quality management systems. Guidelines for improving performance».

10.Law of Ukraine «On the quality and safety of food products and food raw materials».

Additional

11. Scientific and practical aspects of pectin and pectin produts / I. Krapivnytska, V. Ladyka, M. Ianchyk, S. Omelchenko, O. Melnyk, F. Pertsevyi. – Kharkiv : Dissa+, 2022. – 228p.

12. Інноваційні технології в підприємствах галузі : Лабораторний практикум для студентів 1 курсу спеціальності 181 «Харчові технології» денної та заочної форм навчання, освітній ступень «Магістр» / уклад. О.Ю. Мельник, О.Ю. Кошель, С.П. Боковець, - Суми: Сумський національний аграрний університет, 2022р. – с. 44.

13. Методологія наукових досліджень : навчальний посібник для студентів і аспірантів спеціальності 181 «Харчові технології» / Ладика В. І., Шильман Л. З., Перцевой Ф. В. та ін. / за заг. редакцією Ладики В. І. – Херсон : ОЛДІ-ПЛЮС, 2021. – 22213.

14. O. Melnyk. The use of milk thistle seed flour in the composition of yeast dough for cheese pastr. / O. Melnyk, T. Marenkova, O. Koshel // Grain Products and Mixed Fodder's, 22(3), Fodder's, Vol.22, I.3 (87) / 2022, 40-45. https://doi.org/10.15673/gpmf.v22i3.2460

15. Сучасні досягнення харчової науки : навчальний посібник для студентів і аспірантів спеціальності 181 «Харчові технології» : У 2-х ч. Ч. 2 / Ладика В. І.,

Шильман Л. З., Перцевой Ф. В. та ін. / за заг. редакцією Ладики В. І. – Херсон : Олді+, 2022. – 352 с.

16. Мельник О. Ю., Мазуренко І. К., Степанова Т. М., Кошель О. Ю., Сабадаш С. М. Особливості технології нового батончика желейного. Науковий вісник ТДАТУ, 13, том 1, с. 23 https://drive.google.com/file/d/1BP8_dGxlYmreGbtKyr_GneOn98Fjq_XJ/view

17. Chunli DENG, Oksana MELNYK, Yanghe LUO. Substitution of wheat flour with modified potato starch affects texture properties of dough and the quality of fresh noodles. Food Science and Technology (Campinas), 2023, 43, e128222. https://doi.org/10.1590/fst.128222

18. Статистичний збірник "Наукова та інноваційна діяльність в Україні" у 2016 році [текст] / Відповідальний за випуск О.О. Кармазіна. — К.: Державна служба статистики України, 2017. — 141 с.

19. Середа О. Г. Новий вид функціональної сировини з підвищеним вмістом білку для бісквітних виробів / О.Г. Середа, О.Ю. Мельник // Технічні науки та технології, (2(28), 102–110. https://doi.org/10.25140/2411-5363-2022-2(28)-102-110

20. Functional drink technology with chia seeds / Wang Haiyan, Melnyk Oksana, Li Bo // Зернові продукти і комбікорми, Vol.21, I.1(81)/ 2021 – с. 20-30
DOI: 10.15673/gpmf.v21i1.2093