

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

Syllabus of educational component

BK 9 INNOVATIVE FOOD INGREDIENTS
selective

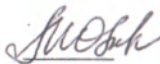
Implemented within the educational program Food technology

In specialty 181 - Food Technology

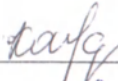
Educational degree Bachelor

Sumy – 2024

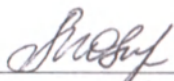
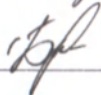
Developer:  **Stepanova T.M., PhD, Associate Professor**

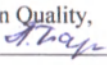
Considered and approved at the meeting of the Department of Technology of Nutrition	Protocol 19 by 31.05.2024
	Head of the Department <u></u>

Approved:

Guarantor of the educational program  **Koshel O.Yu.**

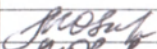
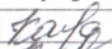
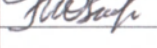
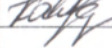
Dean of the faculty  **Bolhova N.V.**

A review of the work program (attached) is provided: 
 **S. Bokovets**

Methodist of the Department of Education Quality, Licensing and Accreditation  **(Tajis Bakanik)**

Registered in the electronic database: date: 15.07. 2024.

Information about 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 Protocol of the meeting of the department	Head of Department	Guarantor of the educational program
2023-2024	2	№ 25 from 26.05.2023		
2024-2025	3	№ 19 from 31.05.2024		

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name of educational component	BK 9 Innovative food ingredients							
2.	Faculty/Department	Food Technology /Technology of Nutrition							
3.	Status of EP	Selective							
4.	EK can be offered for (filled for selective EK.)	181 Food Technology							
5.	Level NQF	6 level							
6.	Semester and duration of study	1st semester, 1-15 week							
7.	Credits ECTS	5							
8.	The total volume of hours and their distribution	Contact work (classes)						Independent work	
		Lecture		Practise/Seminars		Lab			
		Full-time	External	Full-time	External	Full-time	External	Full-time	External
		30	8	-		44	10	76	132
9.	Language of education	English							
10.	Teacher / Coordinator of the educational component	Stepanova T.M.							
12.	Contacts	<p>Name: Stepanova Tetiana Position: Associate Professor of Department of Technology of Nutrition Working place: office 314 of Mechanization Building E-mail: tetiana.stepanova@snau.edu.ua Phone: +380997113679 Consultation time: Monday from 13-00 to 14-00</p>							
13.	General description of the educational component	<p>The educational component includes sections on the current state and prospects for the development of the food industry in the aspects of scientific substantiation of the use of innovative food ingredients. The content of the discipline is adapted to the specialty. The subject of this course is a set of knowledge of food ingredients and their use in the design of innovative food foods. Attention is emphasized on the main types of modern food raw materials in order to effectively introduce it in the creation of innovative food.</p>							
13.	The aim of education component	<p>Provide sufficient theoretical and practical level of students' knowledge of the use of technological solutions aimed at preserving and improving the nutritional value of finished products, reducing its cost and introducing waste-free technologies.</p>							

14.	Prerequisites for studying EK, connection with other educational components of EP	<p>1. The educational component is based on knowledge of food technology (knowledge of the features of production of dishes and culinary products by means of restaurant enterprises), standardization, certification and management of food quality and services of the restaurant industry (knowledge of basic regulatory documents governing the activity of restaurant enterprises).</p> <p>2. The educational component is the basis for studying EC innovative technologies in industry enterprises</p>
15.	The policy of academic integrity	<p>Adherence to academic integrity for higher education seekers involves: independent performance of educational tasks, tasks of current and final control of learning outcomes; references to sources of information in the case of the use of ideas, statements, information; compliance with copyright law; providing reliable information about the results of their own educational or scientific activities.</p> <p>Violations of academic integrity in the study of this course are: academic plagiarism, academic fraud (copying, deception, publishing someone's work for their own), the use of electronic devices during the final control of knowledge</p> <p>For violation of academic integrity, students may be held subject to the following academic liability:</p> <p>Academic plagiarism - grade 0, re-completion of the task.</p> <p>Academic fraud - cancellation of points; re-assessment re-performance of non-independently performed work;</p> <p>Use of electronic devices during the final control of knowledge - removal from work, grade 0, re-passing the final control</p>
16	Course link in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=5052

2. EDUCATIONAL COMPONENT LEARNING RESULTS AND THEIR CONNECTION WITH PROGRAMMATIC LEARNING OUTCOMES

Learning results for EC: After studying the educational component, the student will be able to...	Program learning outcomes that are directed to EC (indicate the number according to the number given in EP)				As the LOE is estimated
	PRE 1	PRE 6	PRE 7	PRE 11	
LOE 1. Know the foundation of designing food composition with the use of modern food ingredients by developing and improving food production technology	+	+			Multiple selection and compliance tests, solving situational problems
LOE 2. Have the skills to use innovative food ingredients through the introduction of modern technologies of semi-finished and finished products		+	+		Multiple selection and compliance tests, solving situational problems
LOE 3. Develop and improve food production technologies by applying technological solutions aimed at preserving and increasing the nutritional value of finished products, reducing production costs and implementing waste-free technologies.				+	Multiple selection and compliance tests, solving situational problems
LOE 4. Independently acquire modern knowledge and effectively establish communication when performing team tasks			+		Presentation with a report, differential test

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

Topic. List of issues to be addressed within the topic	Distribution within the general budget of time			Recommended literature ¹
	Class work		Indep work	
	Lc	Lab		
	Full /Ext	Full /Ext	Full /Ext	
Topic 1. Ingredient components of food products The purpose of the discipline. Macronutrients: proteins, fats, carbohydrates. Micronutrients: vitamins, minerals. Phytonutrients: carotenoids, flavonoids. Sweeteners.	6/2	4/2	12/22	1, 2, 3, 4
Topic 2. Legal regulation of the use of food ingredients Food ingredients classification. Hygienic rationing of food ingredients. Documents regulating the use of food ingredients during the production and sale of food products	2/0	4/0	12/22	2,4,5,6
Topic 3. Functional food ingredients The concept of functional food ingredients. Classification and properties of functional foods. Scientific principles of creating functional foods. The main stages of development of functional foods.	8/2	12/2	14/22	2,4,5,6,11
Topic 4. Technological food additives. Preservatives. Antioxidants. Emulsifiers. Consistency regulators. Acidity regulators.	4/2	8/2	12/22	1, 2,6, 8,10
Topic 5. Physiological ingredients of natural origin. Substances with barrier protection functions. Lipotropic compounds. Antiatherosclerotic substances.	6/2	8/2	12/22	1,2,3,5,6, 9
Topic 6. Use of food ingredients. The use of food ingredients of plant origin. The use of food ingredients of animal origin.	4/0	8/2	14/22	1,2,4,5,7,10,11
Total	30/8	22/2	76/132	

4. TEACHING AND LEARNING METHODS

LOE	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 perform independently)	Number of hours
LOE 1. Know the foundation of designing food composition with the use of modern food ingredients by developing and improving food production technology	<i>Explanatory-reproductive methods:</i> lecture, story-explanation, aimed at highlighting the value-oriented content of educational material (in the context of professional tasks) Use of the MOODLE, ZOOM platform during the mixed form of training.	38	work with textbooks, manuals, materials of the Internet; , illustration, demonstration, performance of independent works, etc.	38
LOE 2. Have the skills to use innovative food	<i>Partial search methods:</i> problem-dialogue,	37	independent search of educational information	37

¹Specific source from the main or additional recommended literature

ingredients through the introduction of modern technologies of semi-finished and finished products	modeling, case method, etc. Use of the MOODLE, ZOOM platform during the mixed form of training.			
LOE 3. Develop and improve food production technologies by applying technological solutions aimed at preserving and increasing the nutritional value of finished products, reducing production costs and implementing waste-free technologies.	<i>Partial search methods:</i> problem-dialogue, modeling, case method, etc Use of the MOODLE, ZOOM platform during the mixed form of training.	38	Literature review and regulatory documentation on the topic, on the Moodle platform	38
LOE 4. Independently acquire modern knowledge and effectively establish communication when performing team tasks	<i>Problematic - discussions</i> and debates on the studied material. <i>Lecture-press conference.</i> Use of the MOODLE, ZOOM platform during the mixed form of training	37	Literature review and regulatory documentation on the topic, on the Moodle platform	37

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1. Diagnostic evaluation (indicated if necessary)

5.2. Summative assessment

5.2.1 To assess the expected learning outcomes provided

1.	Interview	10 points /10%	Up to 15 weeks
2.	Presentation with a report	15 points /15%	Up to 15 weeks
3.	Multiple selection and compliance tests	15 points /15%	Up to 10 weeks
4.	Differential test (tests of multiple choice)	30 points /30%	Credit week

5.2.2 Evaluation criteria

Component	Unsatisfactorily	Satisfactorily	Good	Excellent
Interview	<3 points	3-5	6-8 points	9-10 points
	Task requirements don't met	Most requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All requirements of the task are fulfilled...	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Solving of situational tasks	<3 points	3-5	6-8 points	9-10 points
	Task requirements don't met	Most requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All requirements of the task are fulfilled, the situational task is solved completely, the report is made	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered
Presentation with a report	<3 points	3-5	6-8 points	9-10 points
	Task requirements don't met	The presentation is prepared, but the report is vague, not logical	All the requirements of the task are met,	All requirements of the task are fulfilled, creativity, thoughtfulness

			the report and presentation meet the requirements	is shown, own solution is offered
Protocols of laboratory training	<5 points	5-10	11-15	16-20
	Task requirements don't met	Most of the requirements are met, but there are minor violations of the methods	The task is done correctly	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution is offered
Multiple choice tests	<2 points	2-9	10-13	14-15
	Less than 3 correct answers	3-7 correct answers	8-9 correct answers	All correct answers

Formative assessment:

No	Elements of formative assessment	Date
1.	Written survey after studying the topics with feedback from the teacher	15 minutes at the end of the lesson at the end of the study of the topic
2.	Oral feedback from the teacher while working on situational tasks during classes	next lesson after learning a new topic
3.	Oral feedback from the teacher and students after the presentation with the report	10-15 weeks
4.	Express survey with peer review by students	before the each laboratory trainings
5.	Final test control with feedback from the teacher	at the end of each topic

6. EDUCATIONAL RESOURCES (LITERATURE)

6.1. Main sources

1. Food additives and human health. (2020). In *Bentham Science Publishers eBooks*. doi.org/10.2174/97898114461391200101
2. Natural additives in foods. (2023). In *Springer eBooks*. doi.org/10.1007/978-3-031-17346-2
3. Handbook of Nutrition and Diet (2019). 816. <https://www.routledge.com/Handbook-of-Nutrition-and-Diet/esai/p/book/9780367398279>
4. Preedy, V.R. (2011). Handbook of Behavior, Food and Nutrition. 2094. <https://doi.org/10.1007/978-0-387-92271-3>
5. Sizer F. (2019). Nutrition: Concepts and Controversies. 880.
6. Thompson J. (2019). The Science of Nutrition. 976. <https://docplayer.net/36251400-The-science-of-nutrition.html>

6.2 Additive sources

7. Microbes for natural food additives. (2022). doi.org/10.1007/978-981-19-5711-6
8. Natural food additives. (2022). In *IntechOpen eBooks*. doi.org/10.5772/intechopen.91548
9. Kebede M, Admassu S. Application of antioxidants in food processing industry: Options to improve the extraction yields and market value of natural products. *Advances in Food Technology and Nutritional Science Open Journal*. 2019;5(2):38-49. DOI: 10.17140/AFTNSOJ-5-155
10. Stepanova T.M. (2023) The Prospect of Using Non-Traditional Raw Materials for Fillings as a Component of Culinary Brands of Sumy Region. *TESS Res Econ Bus*. 2(1): 113
11. Shang, F., Kryzhyska, T., Liu, Y., Duan, Z., Danylenko, S., Stepanova, T. & Koshel, O. (2022). Effects of Different Natural Food Coloring Additions on the Quality of Chicken Sausage. *Journal of Chemistry and Technologies*, 30(2), 265–274. doi.org/10.15421/jchemtech.v30i2.244538

Software

Software (to support distance learning (Moodle), online survey (Kahoot, LearningApp), etc

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