MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SYMY NATIONAL AGRARIAN UNIVERSITY

Department of Nutrition Technology

«Approved by»
Head of Department
(F.V.Pertsevoi)
«25» June 2020

EDUCATIONAL PROGRAM

MODERN ADVANCES IN FOOD SCIENCE

Knowledge Area 18 "Manufacturing and Technology"
Specialty: 181 "Food technologies"

2020-2021 academic year

Educational program of subject «**Modern advances in food science**» for postgraduate students by specialty 181 "Food technologies"

Developed by: PhD, Assosiate Professor of Food Technology Department Stepanova T.M.

The educational program is approved at the meeting of the **Department of Nutrition Technology**

Protocol from "25" June 2020 № 16

Head of Department _____ (Pertsevoi F.V.)

Agreed:

Guarantor of the educational program _____ (Ключник О.О.)

Dean of the Faculty of Food Technologies _____ (O.V. Radchuk)

Methodist of the Department of Education Quality,

Licensing and Accreditation _____ (N.M. Baranik)

Registered in the electronic database: date: 28.08. 2020 p.

1. Description of the discipline

<table>
<tr><td rowspan="2">Name of indicators</td><td rowspan="2">Branch of knowledge, direction of training, educational and qualification level</td><td colspan="2">Characteristics of the discipline</td></tr>
<tr><td>full-time education</td><td>full-time education</td></tr>
<tr><td>Amount of credits – 2,5</td><td>Branch of knowledge: <u>18 «Production and technology»</u></td><td colspan="2">Selective</td></tr>
<tr><td>Modules – 2</td><td rowspan="6">Specialty:
181 Food technology</td><td colspan="2">Year of education:</td></tr>
<tr><td>Content modules 2</td><td colspan="2">2020-2021</td></tr>
<tr><td rowspan="5">Total hours – 90/90</td><td colspan="2">Course</td></tr>
<tr><td colspan="2">1</td></tr>
<tr><td colspan="2">Semester</td></tr>
<tr><td colspan="2">1</td></tr>
<tr><td rowspan="8">Weekly hours for full-time study:
classroom – 1,5
independent work – 1,5</td><td rowspan="8">Educational-scientific level: third</td><td colspan="2">Lectures</td></tr>
<tr><td colspan="2">22</td></tr>
<tr><td colspan="2">Practical, seminars</td></tr>
<tr><td colspan="2">22</td></tr>
<tr><td colspan="2">Independent work</td></tr>
<tr><td colspan="2">46</td></tr>
<tr><td colspan="2">Individual tasks –</td></tr>
<tr><td colspan="2">Type of control: exam</td></tr>
</table>

Note.

The ratio of the number of hours of classroom studies to independent work is (%):for full-time education (%): 49/51

1. Purpose and tasks of the discipline

Purpose: expansion and deepening of student's knowledge about the current state and prospects of the nutrition development, scientific substantiation of use the innovative methods of processing raw materials;

acquisition of theoretical and practical skills by students and their implementation during the design of the newest functional recognition products;

ability to diagnose the technologies of culinary production as integral technological systems aimed at improving existing and developing more effective innovative technologies;

ability to determine the peculiarities and dynamics of the transformation of the restaurants formats in accordance with changes in the restaurant business.

Tasks: training of future specialists on important problems of nutrition technologies: improvement of existing and development of innovative food technologies based on the latest achievements of science and technology;

research of regularities of the formation of the range of culinary products, definition of development prospects;

mastering methods for planning the latest product formulations.

As a result of studying the discipline, the postgraduate student must:

Know: theoretical basis for the production of capsule products;

preparation of products in vacuum;

use of low temperatures for preparation of products and other innovative technologies;

schemes of technological processes of preparation of products under new technologies;

methods of modeling the recipes of finished products;

the range of products manufactured using these technologies, the requirements for their quality, the conditions and the timing of its storage and sale.

Be able to: create schemes of technological processes of preparation of products under new technologies;

develop formulations of new products using mathematical modeling methods;

evaluate the quality of finished products, to formulate requirements for the conditions and terms of its storage and sale.

2. Educational program

(Approved by AC of SNAU 28.11.18, Protocol № 3)

Content module 1. Modern food technology.

Topic 1. Introduction. Granular products technology.

The purpose and objectives of the course. Granular products technology.

Topic 2. Technologies of vegetable oil enrichment. The technology of the culinary production of the emulsion type.

Technology of vegetable oils enrichment with carotenoids. The technology of cooking sauces with the use of enriched oils. Using of enriched vegetable oil in cream technology. Technology of semi-finished product from sand dough with carrot fat.

Topic 3. Low temperature methods of raw materials processing.

Use of vacuum packages for the production of semi-finished and finished products. Modes of technological process of semi-finished products and finished products production in vacuum packages. Their advantage and disadvantages of technology, safety.

Content module 2. New technologies for cooking dishes and drinks.

Topic 4. New technologies for cooking dishes.

Technology of finely dispersed powders and pastes for rapid freezing and cryogenic crushing. Ozone use technology to improve the technological properties of wheat baking flour. Method of heat treatment intensification for meat semifinished products. The technology of obtaining high-fat grease powder. Technology of fruits carbonization.

Topic 5. New technologies for cooking drinks.

Features of the development of cocktail preparation technology. Tasks and directions of modern myxology, its disadvantages. Varieties of molecular cocktails.

Topic 6. Technology of products with polyphase dispersed structure (PDS).

Substantiation of successive dispersion of separate phases (air, fat, solid particles). Pickering's mechanism for stabilizing systems with PDS. Models of sterile stabilization the systems with polyphase disperse structure. Ensuring technological stability of food products with PDS. Assortment and technology of stuffed semi-finished products.

4. Structure of the discipline

Names of content modules and topics	**Number of hours**											
	Full-time						external form					
	Total	including					Total	including				
		Lectures	Practical	Laboratory	Individual	Independ-		Lectures	Practical	Laboratory	Individual	Independ-
Content module 1. Modern food technology												
Topic 1. Introduction. Granular products technology.	**10**	**2**	**2**			**6**						
Topic 2. Technologies of vegetable oil enrichment. The technology of the culinary production of the emulsion type.	**16**	**4**	**4**			**8**						
Topic 3. Low temperature methods of raw materials processing	**16**	**4**	**4**			**8**						
Totally content module 1	**42**	**10**	**10**			**22**						

Content module 2. New technologies for cooking dishes and drinks.												
Topic 4. New technologies for cooking dishes.	**16**	**4**	**4**			**8**						
Topic 5. New technologies for cooking drinks.	**16**	**4**	**4**			**8**						
Topic 6. Technology of products with polyphase dispersed structure (PDS).	**16**	**4**	**4**			**8**						
Totally content module 2	**48**	**12**	**12**			**24**						
Totally hours in discipline	**90**	**22**	**22**			**46**						

5. Topics and plan of lectures

№ з/п	Title of theme	Number of hours
1	**Topic 1. Introduction. Granular products technology.** The purpose and objectives of the course. Granular products technology.	2
2	**Topic 2. Technologies of vegetable oil enrichment. The technology of the culinary production of the emulsion type.** Technology of vegetable oils enrichment with carotenoids. The technology of cooking sauces with the use of enriched oils. Using of enriched vegetable oil in cream technology. Technology of semi-finished product from sand dough with carrot fat.	4
3	**Topic 3. Low temperature methods of raw materials processing.** Use of vacuum packages for the production of semi-finished and finished products. Modes of technological process of semi-finished products and finished products production in vacuum packages. Their advantage and disadvantages of technology, safety.	4
4	**Topic 4. New technologies for cooking dishes.** Technology of finely dispersed powders and pastes for rapid freezing and cryogenic crushing. Ozone use technology to improve the technological properties of wheat baking flour.	4
5	**Topic 4. New technologies for cooking dishes (continuation).** Method of heat treatment intensification for meat semifinished products. The technology of obtaining high-fat grease powder. Technology of fruits carbonization.	4
6	**Topic 5. New technologies for cooking drinks.**	4

	Features of the development of cocktail preparation technology. Tasks and directions of modern myxology, its disadvantages. Varieties of molecular cocktails.	
	Totally	**22**

6. Topics of laboratory classes

№	Title of topics	Number hours
1	Study the technology of granular products	2
2	Study of emulsion type production technology	4
3	Study of semi-finished product technology in vacuum packages	4
4	Study of new dishes technologies	4
5	Study of new beverage technologies	4
6	Assessment of the success of learning material	4
	Totally	**22**

7. Self-dependent work

№	Title of topics	Number hours
1	**Topic 1.** Introduction. Granular products technology.	6
2	**Topic 2.** The technology of the emulsion type culinary production.	8
3	**Topic 3.** Low temperature methods of raw materials processing.	8
4	**Topic 4.** New technologies for cooking dishes.	8
5	**Topic 5.** New technologies for cooking drinks.	8
6	**Topic 6.** Technology of products with polyphase dispersed structure (PDS).	8
	Totally	**46**

8. Methods of training

1. Methods of individually differentiated learning:

1.1. Personalized Learning - an individually directed process of displaying graduate student achievement online that provides a flexible learning environment, deploying more resources,

1.2. Differentiated Instructoin – by consulting the applicants as scheduled,

1.3. Inquiry-based Learning – gaining knowledge by formulating your own questions and finding answers to them.

2. Methods of training on the nature and level of independent mental activity of applicants.

2.1. Problematic (problematic-informational)

2.2. Active teaching methods are the use of technical training tools, the use of problematic situations, the use of training and control tests, the use of basic lecture notes.

2.3. Interactive Learning Technologies are the use of multimedia technologies, interactive whiteboards and spreadsheets.

9. Control methods

1. Rating control over a 100-point ECTS rating scale
2. Conducting intermediate control during the semester
3. Multicriteria evaluation of the applicants:
- the level of knowledge demonstrated in laboratory classes;
- activity during the discussion of the issues raised in the class;
- results of laboratory work execution and protection;
- self-study of the topic as a whole or individual issues;
- test results;
- written tasks in the course of control work.
4. Conducting an assessment of the applicant on the results of individual work on the topic received during the presentation and protection of the completed task before the commission.

10. Distribution of points awarded by postgraduate students

<table>
<tr><td colspan="6">Current testing and independent work</td><td rowspan="4">Total for the modules</td><td rowspan="4">Attestation</td><td rowspan="4">Individual work</td><td rowspan="4">The final test - exam</td><td rowspan="4">Total</td></tr>
<tr><td colspan="3">Module 1 – 20 points</td><td colspan="3">Module 2 – 20 points</td></tr>
<tr><td colspan="6">Content modules</td></tr>
<tr><td colspan="3">1</td><td colspan="3">2</td></tr>
<tr><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T5</td><td>T6</td><td rowspan="2">40</td><td rowspan="2">15</td><td rowspan="2">15</td><td rowspan="2">30</td><td rowspan="2">100</td></tr>
<tr><td>12</td><td>12</td><td>11</td><td>12</td><td>12</td><td>11</td></tr>
</table>

11. Scale of assessment: national and ECTS

The amount of points for all types of educational activities	**Rating ECTS**	**Rating on a national scale**	
		for the exam	**for the credit**
90 – 100	**A**	perfectly	enrolled
82-89	**B**	fine	
75-81	**C**		
69-74	**D**	satisfactorily	
60-68	**E**		
35-59	**FX**	unsatisfactory with the possibility of re-examining	is not enrolled with the possibility of re-examining
1-34	**F**	unsatisfactorily with compulsory repeated study of discipline	is not enrolled with repeated study of discipline

11. Individual tasks.

1. Technology of analogue of black granular caviar according to INEOS.

2. Technology of analogue of red granular caviar.
3. Technology of granular products using ionotropic geleut-embossing.
4. Technology of extraction of carotenoids from carrots with vegetable oils.
5. Technology of enrichment of mayonnaise and dressings with vegetable oils colored with carrot carotenoids.
6. Technology of cream enriched with vegetable oil enriched with carrot carotenoids.
7. Technology of sand semi-finished product enriched with carotenoids.
8. Technology of the content of red caviar granules enriched with carotenoids.
9. Technology of semi-finished products in vacuum packages.
10. The use of low-temperature freezing and cryodisperse grinding for the production of food biologically active additives.
11. Prospects for the use of electrostatic phenomena in the production of food products.
12. Technology of bubbles and their use in cooking.
13. Technology of gelatin broth clarification.
14. Technology of powders from liquids with high fat content.
15. Use of carbonization method in new technologies.
16. Modern mixology.
17. Characteristics of QFD-methodology

12. Recommended literature

Basic:

1. Quality Assurance for the Food Industry: A Practical Approach / J. Andres Vasconcellos // New York. CRC Press. 2003. P. 448.

http://www.bookhut.net/wp-content/uploads/2014/05/Quality-Assurance-for-the-Food-Industry-A-Practical-Approach.pdf

2. Food Quality Assurance. Principles and Practices / Inteaz Alli // New York. CRC Press. 2004. P. 154

http://www.thanut-swu.com/images/BOT331/food%20quality%20assurance.pdf

3. Law of Ukraine "On the quality and safety of food products and food raw materials".
4. Law of Ukraine "On Protection of Consumer Rights"
5. DSTU 4161-2003 «Food safety management systems».
6. DSTU ISO 9000-2001 «Quality management systems. Basic Provisions and Dictionary».
7. DSTU ISO 9001-2001 «Quality management systems. Requirements».
8. DSTU ISO 9004-2001 «Quality management systems. Guidelines for improving performance».
9. Law of Ukraine «On the quality and safety of food products and food raw materials».

Additional:

1. Quality Assurance in Seafood Processing: A Practical Guide/ Bonnell**,** A. David // Island Press. 2004. P. 228. https://books.google.com.ua/books?id=4V31BwAAQBAJ&hl=ru
2. Improving the quality and safety of fresh fruits and vegetables. a practical approach manual for trainers / Maya Piñeiro, Luz Berania Díaz Ríos // Food and Agriculture Organization of the United Nations Rome. 2004. P. 110. http://www.fao.org/ag/agn/cdfruits_en/others/docs/manual_completo.pdf