MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
Sumy National Agrarian University
Department of Engineering Technology of food production

"APPROVED"

Head of Department

_____ **L.H. Rozhkova**

"22" June 2020

WORKING PROGRAM TRAINING COURSE

Engineering innovation

Industry knowledge 18 "Production and Technology"

Specialty 181 "Food Technology"

2020-2021 school year

The work program on discipline engineering innovations 181 "Food Technology"

Developers, Ph.D., associate professor SM Sabadash ( )
name, initials signature

Work Program endorsed by the Department ITHV

Minutes from the "22" June 2020 № 14

Head of Department (Radchuk O.)
(signature) (surname and initials)

Approved:

Agreed:

Guarantor of the educational program (Melnyk O. Y.)
Dean of the Faculty (Radchuk O. V.)
licensing and accreditation (N. M. Baranik)
Registered in the electronic database: date: 24 09 2020

Description of discipline

<table>
<tr><td rowspan="2">Name of indicators</td><td rowspan="2">Industry knowledge and direction of training, education level</td><td>Characteristics of discipline</td></tr>
<tr><td>full-time education</td></tr>
<tr><td rowspan="2">Credits - 3</td><td>Field of knowledge:
<u>18 "Production and Technology"</u></td><td rowspan="2">Special (training</td></tr>
<tr><td>Specialty Food technology 181</td></tr>
<tr><td>Modules - 2</td><td rowspan="8"></td><td>Year of training:</td></tr>
<tr><td>Content module - 2</td><td>2020-2021</td></tr>
<tr><td rowspan="3">Individual the research objectives: - No</td><td>Course</td></tr>
<tr><td>2</td></tr>
<tr><td>Semester</td></tr>
<tr><td rowspan="2">Total hours - 120</td><td>4</td></tr>
<tr><td>Lectures</td></tr>
<tr><td rowspan="8">A weekly hours for full-time:
classroom - 1.5
self-learning - 1.5</td><td rowspan="8">Educational and scientific level:
third</td><td>44</td></tr>
<tr><td>Practical, seminar</td></tr>
<tr><td>44</td></tr>
<tr><td>Independent work</td></tr>
<tr><td>32</td></tr>
<tr><td>One problem: -</td></tr>
<tr><td>Type of control:
differentiated test</td></tr>
</table>

Note.

The ratio of hours of classes to work independently is (%): 73.3 / 26.7

2. The purpose and objectives of discipline

purpose of Teaching discipline "Innovative engineering institutions restaurant industry" is to train highly - skilled professionals who have mastered the theoretical and practical knowledge and skills of professional activity and able to continue to yourself to deepen and expand their use in practice.

The main objectivethe discipline "Innovative engineering facilities restaurant business" - to provide students with the necessary knowledge related to the appointment, selection, deployment, operation, maintenance of process equipment for the implementation of the process in a mini-production of food products in institutions restaurant industry. Also, students form a system of knowledge that are necessary for specialist introduction of new technology, complex mechanical processes.

As required educational and professional program students must:

Know:

The main flow diagrams, process equipment, rules of operation and maintenance, mobility mini production process parameters, ways of improving the quality of products using advanced technology of food production;

Basic safety, sanitation mini-mills;

The main technical and economic indicators of mini-plant compared to full-scale production; raw material supply and marketing.

Be able:

To carry out the selection process equipment for mini-enterprises under the technological scheme;

To carry out work on the installation and connection of technological equipment to the network;

Perform commissioning process equipment mini-productions;

Perform engineering calculations machines use control devices.

3. Discipline Program approved by the Academic Council Official "__" _____ 20__ year report №_

Content module manufacturing equipment 1.Harakteristika stream lines mechanized food production enterprises Mini workshops. Equipment minibakeries.;

Theme 1. Introduction. Feature Feature innovative engineering process equipment streamed mechanized lines vyrobnytstv.Klasyfikatsiya food enterprises technological machinery structure tsyklu.Klasyfikatsiya work process machines

function. The structure and composition of the product lines. Types of gear used in industrial machines. Rationale material for the manufacture of process machines. The main characteristic features streaming mechanized technology

Theme 2. Equipment for a mini-bakeries

Innovations in technology design ZRH. Classification bakery businesses. Apparatus- technological diagrams baker of low power equipment placement on the plan. The basic process equipment minibakeries using lines L4 and A2-CRF-HPO.Budova, working principle and the rules of safe operation liniy.Tistorozkatni, tistopodilni and tistoformovochni machine.

Bakeries furnace and auxiliary equipment. The structure, operating principle, the rules of operation.

Theme 3. Equipment for a mini-plants for the production of sausages

Innovations in Technical ZRH classification meat processing plants. Apparatus- technological diagrams of enterprise sausage small capacity. Equipment for medium and fine crushing of raw meat (Gyroscopes, Cutters, Shpigorezka). The structure, working principle and the rules of safe operation. Equipment for the crushing of "clear material (kolloyidni mill emulsytatory, blenders). Equipment for the formation of sausage products - syringe. Equipment and technology of liquid smoke. The structure, operating principle, the rules of operation.

Theme 4. Equipment for a mini-plants for the production of semi-finished products.

Optimizing processes in ZRH.Aparaturno-January production flowsheet semi equipment that it uses. The structure, working principle and the rules of safe operation. Technological calculations of production flow lines napivfabrykativ.Obladnannya production lines for the production of ravioli. Machinery production lines for the production of empanadas, stuffed pies, potato chypsiv.Budova, the principle of the regulations,

Theme 5. Equipment for a mini-plants for the production of dairy products.

Optimizing labor resursiv.Obladnannya for reception, cooling and storage of milk .. Equipment for separation and purification of milk. The structure, working principle and the rules of safe operation of equipment production lines for the production of milk produktiv..Liniyi for the production of dairy products (cheese, yogurt, sour cream). The structure, working principle and the rules of safe operation.

. Equipment product lines Mini workshops for production of butter by whipping. Equipment for the production of dairy drinks (cheese tubs, open and closed cooling cheese). The structure, operating principle, the rules of operation.

Content module 2Obladnannya Mini workshops for production of beer and processed fruit and vegetable products.

Theme 6. Equipment mini plants for the production of beer.

Methods for determining the costs of work and their optimization. Computer-hardware circuits microbreweries. Equipment for the crushing of malt and barley neosolodzhenoho. The structure, working principle and the rules of safe operation of production lines for the production of beer. Equipment zatornosuslovarochnoho separation and filtration microbreweries. Equipment for the separation of fermentation, and maturation dobrodzhuvannya beer. Refrigeration equipment production lines breweries mini-factories.

Minikompleksiv equipment production lines for the production of soft drinks (fruit drinks, fruit juices). The structure, operating principle, the rules of operation.

Theme 7. Equipment mini-plants for processing of fruits and vegetables

The main ways of optimizing the number of workers to standards and employee. Equipment minikompleksa automated line for processing tomatoes and cucumbers. Equipment minikompleksa automated line for drying fruits and vegetables. The structure, working principle and the rules of safe operation of production lines for processing and drying fruits and vegetables. Machinery production lines for the production of tomato paste, fruit and vegetable mash. Machinery production lines for canning peas. The structure, operating principle, the rules of operation.

Description of discipline

Names of content modules and topics	Number of hours											
	DEnna form						Part-time					
	All	including					All	including				
		Lectures	Practical	Lab. of	One	Himself. work		Lectures	Practical	Lab. of	One	Himself. work
Module 1: Introduction. Characteristics of innovative engineering												
Semantic module 1. Introduction. Characteristics of innovative engineering												
Theme 1. Introduction. Characteristics of innovative engineering	12	4	4			4						

Theme 2. Innovations in technology design ZRH	20	8	8			4						
Theme 3. Innovations in Technical ZRH	24	10	8			6						
Together for the content modules 1	56	22	20			14						
Module 2. Methods and organization performance quality control.												
Semantic module 2. Methodology, organization and sensory quality control.												
Theme 4. Optimizing processes in ZRH	14	6	4			4						
Theme 5. Optimization of workforce	18	6	8			4						
Theme 6. Methods for determining the costs of work and their optimization.	16	4	8			4						
Theme 7. The main ways of optimizing the number of workers to standards and employee.	16	6	4			6						
Together for the content modules 2	64	22	24			18						
Total hours on discipline	**120**	**44**	**44**			**32**						

5. Themes and lectures plan

number / p	topic	Number hours
1	Theme 1. Introduction. Characteristics of innovative engineering	4
2	Theme 2. Innovation in technology design ZRH	8
3	3. Subject to technical innovation ZRH	10
4	Theme 4. Optimizing processes in ZRH	6
5	Topic 5. Optimization of workforce	6
6	Topic 6. Methods for determining the costs of work and their optimization.	4

7	Theme 7. The main ways of optimizing the number of workers to standards and employee.	6
	Together	**44**

6. Topics laboratory classes

number / p	topic	Number hours
1	Introducing the classification process equipment product lines Mini workshops for food production. The study of the structure of production lines Mini workshops for food production.	2
2	The study of the structure, operation principles, rules of operation of equipment for sifting flour. Prosiyuvalni sieve. Classification, purpose, structure, work principle. The method of calculation grids.	2
3	The study of the structure, operation principles, rules of operation for kneading equipment. Engineering and technical calculations kneading machines. The study of the structure, operation principles, operation rules tistorozkatnyh, tistopodilnyh Doughes formative and machines.	2

4	The study of the structure, operation principles, rules of equipment operation Mini workshops for middle crushing myasnoyi materials. Gyroscopes. Engineering and technical calculations Volchkov. The study of the structure, operation principles, rules of equipment operation Mini workshops for crushing lard. Engineering and technical calculations shpyhorizok.	2
5	The study of the structure, operation principles, operation rules sobladnannya Mini workshops for fine grinding of raw materials. Cutters, emulsytatory, colloid mills. Engineering and technical calculations Cutters,	2
6	The study of the structure, operation principles, rules of operation equipment for mixing Mini workshops of "clear material. Engineering and technical calculations mixers.	2
7	The study of the structure, operation principles, rules of equipment operation Mini	2

	workshops for forming sausages. Syringes. Engineering and technical calculations syringes.	
8	The study of the structure, operation principles, rules of equipment operation Mini workshops for production of semi-finished products. Making meatballs and ravioli. Engineering and technical calculations kotletoformovochnyh machines.	2
9	The study of the structure, operation principles and rules of operation of the equipment for forming dumplings	**2**
10	The study of the structure, operation principles, rules of operation of equipment for storing milk Mini workshops.	**2**
11	The study of the structure, operation principles, operation rules Pasteurizating cooling equipment.	**2**
12	The study of the structure, operation principles, operation rules, technical specifications separators. .	**2**
thirteen	The study of the	**2**

	structure, operation principles, operation rules solododrobylnoho equipment production lines brewing mini-factories. .	
14	The study of the structure, operation principles, operation rules mash-wort and filtering equipment production lines brewing mini-factories.	**2**
15	The study of the structure, operation principles, rules of operation of equipment for processing tomatoes Mini workshops .. The study of the structure, operation principles, rules of operation of equipment automated line for preserving fruits and vegetables (horoschku green)	**2**
16	The study of the structure, operation principles, rules of operation of equipment for the baking products. Classification and designation.	**2**
17	The study of the structure, operation principles, rules of operation of auxiliary equipment minibakeries.	**2**

	Engineering and technical calculations.	
18	The study of the structure, operation principles, rules of equipment operation Mini workshops for baking and sausage products myasnyh	2
19	The study of the structure, operation principles, rules of equipment operation Mini workshops for smoked sausage and of "clear products. Engineering and technical calculations smoking chambers and smoke generator.	2
20	The study of the structure, operation principles and rules of operation of equipment in production lines Mini workshops for production of vegetable cutlets.	2
21	The study of the structure, operation principles, rules of equipment operation Mini workshops for production of cottage cheese.	2
22	The study of the structure, operation principles, rules of operation, hardware specifications Mini workshops for production of dairy drinks	2

	All	**44**

7. Independent work

number / p	topic	Number hours
1	Subject 1. Information technology equipment lines streaming mechanized enterprises food industry	4
2	The study of the structure, operation principles, operation rules shake machines. Classification and designation. Study Methodology of engineering and technological calculations shake machines	4
3	The study of the structure, operation principles, rules of equipment operation Mini workshops for fine grinding of raw meat. Emulsytatory, colloid mills, blenders. Study Methodology of engineering and technological calculations emulsytatoriv, colloid mills. The study of the structure, operation principles, equipment shops operating rules for the production of liquid smoke.	4
4	The study of the structure, operation principles, rules of operation of the equipment for forming January semis. Study Methodology of engineering and technological calculations kotletoformovochnyh machines ..	4
5	The study of the structure, operation principles, rules of operation for cooling plants Mini workshops cottage cheese. The study of the structure, operation principles, rules of operation of equipment for packaging cheese dairy.	4
6	The study of the structure, operation principles, rules of operation of equipment for refrigeration compartment in technological lines of brewing mini-factories.	4
7	The study of the structure, operation principles, rules of operation of equipment automated line for preserving fruits and vegetables (tomatoes)	4
8	The study of the structure, operation principles, rules of operation of equipment automated line for drying fruits and vegetables.	4
	All	**32**

8. **teaching methods**

1. Methods of learning source of knowledge:

1.1. Verbal: Work with book, summarizing, making tables, graphs, summaries of support, etc.).

1.2. Visual: demonstration, observation.
1.3. Practical: practical work.

2. Methods of studying the nature of logic knowledge.

2.1. Analytical

3. Methods of studying the nature and level of independent intellectual activity of students.

3.1. Problem (problem-information)

4. Active learning methods - use of technology learning, problem situations, the use of training and control tests using reference lectures.

5. Interactive learning technologies - the use of multimedia technology, interactive whiteboard and spreadsheets.

9. **control methods**

1. Rating control a 100-point scale assessment ECTS
2. Implementation of the interim control during the semester
3. Polikryterialnaya adverse assessment of students:
- the level of knowledge demonstrated in laboratory studies;
- activity when discussing issues submitted to classes;
- results of performance and protection of laboratory work;
- independent processing threads in general or specific issues;
- test results;
- writing assignments during the tests.

10. Distribution of points receiving students

on dyf.zalik

Routine testing and independent work							**However, for modules and CDC**	**Certification**	**Sum**
Content Module 1 - 35 points			**Content module 2 - 35 points**						
T1	T2	T3	T4	T5	T6	T7	85 (70 + 15)	15	100
15	10	10	10	5	10	10			

Grading scale: national and ECTS

Total points for all the educational activities	**Assessment ECTS**	**Evaluation of national scale**	
		for examination, course project (work), practice	**for scoring**
90 - 100	**AND**	perfectly	Accepted
82-89	**IN**	fine	
75-81	**WITH**		
69-74	**D**	satisfactorily	
60-68	**IS**		
35-59	**FX**	unsatisfactorily with	not reckoned with the

		possibility of re-drafting	possibility of re-drafting
1-34	**F**	unsatisfactorily with the mandatory repeated study of discipline	not reckoned with the obligatory re-learning courses

11. Individual tasks

Theme 1.

1. Develop the equipment and technological scheme of production of bakery products for small capacity shop (mini-bakeries). Explain the purpose, structure and principle of operation of basic process equipment.

2. Perform the calculation of the technical parameters (efficiency and power of the drive motor) of the kneading machine. The initial date is specified by the project supervisor.

Theme 2.

1. Develop the equipment and technological scheme of production of bakery products for mini-bakeries. Explain the purpose, structure and principle of operation of basic process equipment.

2. Perform the calculation of the technical parameters (performance and power of the drive motor) of the flour sieve. The initial date is specified by the project supervisor.

Theme 3.

1. Develop an equipment and technological scheme of production of cooked sausages in a shop with low capacity of 1000 kg for the shift. Explain purpose, structure and operating principle of basic technological equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 4.

1. Develop the equipment and technological scheme of production of chopped semi-finished products in the shop of small capacity with a capacity of 800 kg for the shift. Explain the purpose, structure and principle of operation of basic process equipment.

2. Perform calculation of the technical parameters (productivity and power of the drive motor) of the machine the forms meat bolls. The initial date is specified by the project supervisor.

Theme 5 .

1. Develop the equipment and technological scheme of production of smoked sausage products in the shop with small capacity of 1000 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 6 .

1. Develop the equipment and technological scheme of bread production in the shop of low power . Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform the calculation of the technical parameters (performance and power of the drive motor) of the lard chopping machine. The initial date is specified by the project supervisor.

Theme 7 .

1. Develop the equipment and technological scheme of production of hard cheese in the shop of small capacity with a capacity of 800 kg. for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform the calculation of the technical parameters (performance and power of the drive motor) of the **cutter**. The initial date is specified by the project supervisor.

Theme 8 .

1. Develop the equipment and technological scheme of production of drinking milk in the shop with small capacity of 1000 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform the calculation of the technical parameters (performance and power of the drive motor) of the homogenizer . The initial date is specified by the project supervisor.

Theme 9 .

1. Develop the equipment and technological scheme of milk powder production . Explain purpose, structure and basic principle of the process equipment.

2. Perform the calculation of the technical parameters (performance and power of the drive motor) of the separator . The initial date is specified by the project supervisor.

Theme 10 .

1. Develop an equipment and technological scheme for the production of dumplings in a small capacity shop with a capacity of 1000 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 11 .

1. Develop an equipment and technological scheme for the production of cooked sausages in a small capacity shop with a capacity of 500 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 12 .

1. Develop an equipment and technological scheme for the production of cooked sausages in a small capacity shop with a capacity of 2000 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 13 .

1. Develop an equipment and technological scheme for the production of cooked sausages in a small capacity shop with a capacity of 100 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

Theme 14 .

1. Develop an equipment and technological scheme of production of cooked sausages in a shop with low capacity with a capacity of 1500 kg for the shift. Explain the purpose , structure and principle of operation of basic process equipment.

2. Perform calculation of technical parameters (performance and power of the drive motor) of the mincing machine. The initial date is specified by the project supervisor.

11. Suggested Reading

Basic

1. VA Domaretskyy, PL Shiyan, MN Kalakura, LF RomanenkoL.M.Homichak etc .. "General technology of food production" Kyiv University "Ukraine", 2010, -814 with..

VF 2.Dotsenko Equipment sector institutions restrannoho / VF Dotsenko, VA Hubenya - Kyiv: Condor -Vydavnytstvo, 2016. -636 p.

3.V.F.Petko, OI. Haponyuk, EV Petka, AV Ulyanytskyy "Technological Equipment for bakery, pasta and confectionery" Kyiv, 2007 - 432 p.

4.Yeresko GA Technological equipment dairy production / Yeresko GA, Shynkaryk MM Voroschuk VJ, Kyiv, the company "Inox" 2007, -338 p.

5.O. V. Gvozdev, F. Yu Yalpachyk, YL Rogach, DM Kyurcheva "Production equipment for the processing of animal products" Amounts "Environment" 2004, -420 p.

6.O. Datsyshyn AV, AV Gvozdev, F. Yu Yalpachyk, YP Rogach "Mechanization processing and storage of fruits and vegetables" Kyiv, "META" 2003, -288 p.

7.Deynychenko GV Efimov VA, GM Postnov Equipment catering .: Handbook. In 3 4. Kharkov, SE Version "World of Technics and Technology", 2002. - 256 p.

8.H. I. Podpryatov, LF SkaletskaA. M. Senkov, VS Hylevych "Storage and processing of plant products" Kyiv "META" 2002, -496 p.

Support

1.M.Y. Bots, VD Elhyna, AN Golovanov "mehanycheskoe and thermal equipment trade enterprises and the Public POWER" M., ACADEMA, - 2003, -230 p.

2.M. Goncharov, A. Sazonov, VI pusher "Its bakery" Kharkov, "facts" -2002, -258 p.

3.Tyhomyrov V.H.Tehnolohyya and Organization Brewery and soft /V.H production. Tikhomirov - M .; Publishing "Colossus", 2007 - 461 p.

4. Equipment Mohylnыy M. enterprises the Public Power., Thermal equipment. Textbook. High society for students posobye Textbook. /M.P.Mohylnыy wound, T.V.Kalashnova, A.Yu.Balasanyan; Ed. M.P.Mohylnoho, - 2 nd ed., Erased. -M .; Publishing Center "Academy", 2005.-192 with.

5.Shalыhyna AM General Technology of milk and milk products. Textbook. for Universities / A.M.Shalыhyna, V.M.Kalynyna, M., Publishing "Kolos", 2007, -200 p.

6. Kalynyna VM Tehnicheskoe and Equipment of Labor Protection in the Public Power. / Tutorial dlyaSSUZov, Mastery, -2004, -432 p.

Information resources

1.Professyonalnoe promыshlennoe pyschevoe equipment for otelno and restaurant business.
maresto.com.ua

2. Thermal equipment for restaurants and public establishments
Meals are available orgoborud.com.ua> ua / Teplove-obladnannya.html

3.Oborudovanye for restaurant, cafe, bar, fast food, stolovыh. Equipment for the Public enterprises pytanyya.orest.ua

4. Refrigeration Equipment for catering.
Equipment for pizzerias. Pizza on firewood. diana-west.com.ua