EDUCATIONAL PROGRAM

6B07201 - “Food Technology”

Code and Classification of Educational area: 6B07 Engineering, Processing and Construction Industries

Code and Classification of field of study: 6B072 - Production and Processing Industries

International Standard Education Classification Code: 0720

Qualification: Bachelor of Engineering and Technology in the educational program "6B07201-Food Technology".

Duration of study: 4 years

Nur-Sultan, 2019
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approved by the Faculty Council
report № 9 from “28” 02 2019 year

Dean of Technical Faculty

Nukeshev S.O.

Head of Department «Food technology and processing products»

Kakimov MM
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1 Passport of the educational program
1.1 Objective of the educational program

The objective of the educational program (EP) "Technology of food products" in the direction 6B072 - "Production and processing industries" is to train competitive specialists for food industry and research organizations.

To achieve the above aim of the EP, the following tasks were formulated:

1. Fulfillment of social demand for required specialists
2. Forming skills and competencies in students in the following fields of knowledge: functional food technology; increasing the availability of biologically active substances; enrichment products; fermenting long shelf life products; "clean packaging" products, reducing the level of carcinogens, search for new components, etc.;
3. Formation the image of KATU, as key educational and expert organization in the field of food production among scientific and educational institutions of the republic and Central Asia.

2 General characteristics of the educational program (relevance, features, competitive advantages, uniqueness, stakeholders, etc.)

In one of his addresses to the people of Kazakhstan N.A. Nazarbayev noted: “The high growth rate of the world population sharply aggravates the food problem. For us, this challenge has tremendous opportunities…” This statement sharply accentuates the role of food industry in our time; training of competitive specialists who have successfully mastered modern educational programs is one of the key missions for the Republic of Kazakhstan.

The educational program was developed in accordance with the NQF and professional standards, in accordance with the Dublin descriptors and the European Qualifications Framework, based on the State Compulsory Standard of Higher Education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 (No. 604) and the Standard Curriculum of the specialty in training 6B072 - Production and processing industries.

The uniqueness of the educational program:
- The study program was developed jointly with professors of the University of California Davis (USA) and taking into account recommendations of leading industry experts;
- The scientific experimental platform for the production and processing of agricultural products, created under the State program of industrial and innovative development of Kazakhstan for 2015-2019, is a mirror reflection of the laboratories of UCDavis. The platform consists of 4 experimental production workshops of meat, dairy, bakery products and vegetable oils, the functioning of which is the guarantor of the training of highly qualified specialists. All audiences are equipped with digitalization systems for the educational process, allowing online monitoring of technological processes in workshops.
- Highly qualified faculty. About 70% of faculty members have PhD degrees, are Canditates or Doctors of Sciences.
- Education in multilingual groups and dual technology, i.e. the theoretical part of classes is held in the university classrooms, and practical classes are held in manufacturing enterprises.

- Students have the opportunity to study for a semester in leading universities in Europe, the United States and other countries. An average of 10-15 students annually leave to study and for internships via various programs (International Credit Mobility; LOGO - Landwirtschaft und Oekologisches Gleichgewicht mit Osteuropa; Weihenstephan-Triesdorf, Angers, etc.) to worldsleading universities, such as Angers University (Université d' Angers, France), University of California at Davis (UCDavis, USA), University of applied Sciences Weihenstephan-Trizdorf (Germany), etc.

- opportunity to study in parallel on the VUS-250300 "Catering" military training programm and continue at amaster level in the universities department.

- access to the social package of services and goods at the university, such as accommodation in student dormitories, purchase of goods from social pharmacy and grocery store, meals in canteens, located on the main campus of the university.

The competitive advantages of this educational program are:

- highly qualified and relatively young faculty (about 70% graduated);

- Educational program is well funded and is adequately supplied with material and equipment (the department has 4 operating experimental production workshops);

- Education is conducted in three languages (state, Russian and English);

- Dual training technology is implemented (part of the classes are held in production);

- International credit mobility, external and internal mobility of the MoEare widely implemented.

- a close relationship with employers and graduates of educational programs;

- 100% of students are provided a room in dormitory during the course of study;

- The presence of a military department and a medical center;

- availability of a social pharmacy and a store for students.

The main stakeholders of the program are:

1. Faculty, students, parents, persons equivalent to them and relatives of students;

2. Ministry of Agriculture of the Republic of Kazakhstan - Department of production and processing of livestock products;

3. Ministry of Agriculture of the Republic of Kazakhstan - Department of Crop Production and Processing;

4. Accredited OPS and IL;

5. NPP RK "Atameken" - Committee of the food industry;

6. Food industry Enterprises;

7. Research institutes and research and production centers.
3 Competency model (pattern) of a graduate

3.1 Fields of professional activities
The field of professional activity of a bachelor in EP "Food Technology" are the fields of food industry (dairy, meat, oil and fat, macaroni, confectionery, wine-making and brewing industry, etc.), R&D organizations, enterprises of various forms and types of ownership.

3.2 Types of professional activity
Types of professional activity in the EP "Technology of food products" are:
- the organization of the technological processes; improvement of technological operations and participation in the development of resource-saving technological processes; analysis of technical equipment and production activities of enterprises taking into account the requirements of ecology, labor protection, fire explosion safety and production sanitation;
- organization of work of work collectives, management decisions; analysis of technical and economic indicators of enterprises and marketing activities; food standardization and certification;
- development and design of technological schemes of enterprises of the food industry and public catering enterprises; reconstruction of existing enterprises of the food industry and public catering;
- the study and analysis of scientific and technical information, domestic and foreign experience in the food industry;
- work in the field of education.

3.3 General educational competences
General competences in the following areas:
Understand the content of any information, express thoughts, feelings, opinions in written and oral forms (listening, speaking, reading and writing) in Kazakh / Russian languages.

To possess basic communication skills in a foreign language: to understand, express, interpret concepts, thoughts, feelings, facts and opinions both verbally and in writing (listening, speaking, reading, writing) in the appropriate range of social and cultural contexts.

The ability to use the basics of natural science knowledge and methodology to identify production problems and solve professional problems.

To use modern information technologies for work, leisure and communications; have computer skills to participate in collaborating networks using the Internet in the food industry.

Have basic knowledge in the field of economic, managerial disciplines (sciences); have the ability to engage in self-study, to be able to effectively manage time and information; strive for professional and personal growth.

Possess ethical and legal norms of social behavior that allow for effective and constructive participation in public and work life; develop the ability to prevent and resolve conflicts, find compromises, relate their opinion with the opinion of the team; comply with business ethics.
Have the basic understanding of economics, have a scientific understanding of management, marketing, finance, etc.; know and understand the goals and objectives of state regulation of the economy; plan and manage projects to achieve professional goals.

Know the traditions and culture of the peoples of Kazakhstan; understand the importance of creative expression of ideas; be aware of the attitudes of tolerant personal behavior and the prevention of domestic racism, xenophobia, and extremism; have high spiritual qualities.

3.4 Basic competences
A. Know and understand:
- food technology;
- technical requirements for raw materials, materials and finished products;
- standards and specifications;
- The basics of the organization of production and the methodology for drawing up business plans;
- The basics of labor law;
- occupational health and safety standards;
- Legislative acts, methods and means that ensures healthy and safe working conditions in industrial enterprises.

B. To be able to:
- improve and optimize the existing technological processes on the basis of a systematic approach to the analysis of the quality of raw materials, the technological process and the requirements for the final product;
- to carry out the analysis of technological processes at the enterprises of processing industries;
- competently analyze and evaluate the actions of subordinates, control the moral and psychological climate in the team, maintain the necessary level of labor discipline;

C. To be skilled in:
- the methods and means of theoretical and experimental research of technological processes and the products obtained;
- management decision-making technology;
- models for studying demand and supply management.

D. Acquire practical skills in:
- management of existing technological processes of food production enterprises;
- statistical processing of experimental data for the analysis of technological processes in the production of various types of products;
- in the operation of technological, transport, operational and energy equipment at the enterprises of the industry;
- work on computers and the use of economic and mathematical methods in the performance of technical and economic calculations in the design and management of enterprises;
- use of research methods and instruments for research;
- in the organization of safe working conditions and emergency response.
E. To acquire practical skills:
- in matters of technology of processing industries;
- in the current problems of the industries of processing industries;
- in the choice of rational modes of technological processes of processing industries.

3.5 Professional competencies

Student's professional competencies generated as a result of the development of EP:

General competencies: to understand the nature and social significance of their future profession, to show sustained interest in it; organize your own activities, choose standard methods and ways of performing professional tasks, evaluate their effectiveness and quality; make decisions in standard and non-standard situations and take responsibility for them; search and use of information necessary for the effective performance of professional tasks, professional and personal development; use information and communication technologies in professional activities; work in a team and team, communicate effectively with colleagues, management, consumers; independently determine the tasks of professional and personal development, engage in self-education, consciously plan advanced training; to be guided in the conditions of frequent change of technologies in professional activity.

Professional competencies: the organization of the preparation process and the preparation of semi-finished products for complex culinary products; organization of the process of preparation and preparation of complex cold culinary products; organization of the cooking process and the preparation of complex hot culinary products; organization of the process of preparation and preparation of complex bakery, flour confectionery; organization of the cooking process and the preparation of complex cold and hot desserts; to maintain inventory, weighing and trade-technological equipment in the process of servicing; maintain accounting records in accordance with regulatory requirements; make a certain range of culinary products; make calculations with the consumer, using various forms of calculation; make mixed drinks, including cocktails, by various methods, hot drinks; conduct quality control and safety of finished products;

4 Work experience providers (all types of internships)

The passage of educational, industrial and pre-diploma internships that are part of the EP is mandatory for the student. The total number of credits for practice is 21 credits, in academic hours - 630.

Educational internship is aimed at developing students initial practical professional skills.

As a result of practical training, the student must be able to calculate raw materials; calculate the recipe of the finished product; make technological schemes; determine the degree of compliance with the technology; take samples for laboratory tests; know the location of workshops, outbuildings, the direction of flows of raw materials and finished products; types of equipment used, its technical characteristics and capabilities.
Pre-diploma internship is aimed to develop practical skills in the development of technical and technological maps for catering products; familiarization with the forms of work and study of the activities of a particular enterprise; Acquisition of organizational skills for structural units; development of quality control methods of products; the acquisition of practical experience of the technologist of the enterprise, as well as the preparation for the implementation of final qualifying work in food production enterprises.

The basis of practical training are experimental manufactures of the department, as well as large enterprises, such as: LLP “Rodina”, LLP “Astana Onim”, LLP “Gormolzavod”, LLP “Bakara”, JSC “Concern Tsesna-Astyk”, LLP “Garant”, LLP “Kazakh Research Institute of Agricultural Products Processing”, and others. In total, agreements have been signed with more than 35 enterprises.

5Structure of the educational program

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of cycles and disciplines</th>
<th>Total labor intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>in academic hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in academic credits</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>1</td>
<td>Cycle of general education disciplines (GED)</td>
<td>1680</td>
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</table>

Mandatory component

- Kazakh (Russian) language 1530 51
- Foreign language 300 10
- Philosophy 300 10
- Culturology and psychology 150 5
- Politics and sociology 150 5
- Highhistory of Kazakhstan 150 5
- ICT (English) 150 5
- Physical training 240 8

1) Academic component(list of disciplines according to EP, WC)

- Environmental security AIC 150 5

Component optionally(list of discipline according to EP, WC)

2) Cycle of basic disciplines (BD)( list of discipline according to EP, WC)

1) Academic component

- Mathematics 180 6
- Chemistry 150 5
- Physics 120 4
- Educational practice 30 1
- Microbiology 120 4
- Chemistry and biochemistry of food 150 5
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionally-oriented foreign language</td>
<td>120</td>
<td>4</td>
</tr>
<tr>
<td>Professional Kazakh (Russian) language</td>
<td>90</td>
<td>3</td>
</tr>
<tr>
<td>English (optional)</td>
<td>90</td>
<td>3</td>
</tr>
<tr>
<td>Descriptive geometry and engineering graphics</td>
<td>120</td>
<td>3</td>
</tr>
<tr>
<td>Applied mechanics</td>
<td>150</td>
<td>5</td>
</tr>
<tr>
<td>Automation execution drawing s</td>
<td>150</td>
<td>5</td>
</tr>
<tr>
<td>Standardization, metrology and certification of food industry</td>
<td>180</td>
<td>6</td>
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<tr>
<td>2) Optional component</td>
<td></td>
<td></td>
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<tr>
<td>Processes and equipment for food products / processes and apparatuses processing facilities</td>
<td>180</td>
<td>6</td>
</tr>
<tr>
<td>Equipment production of food / equipment for deep processing of raw biofuel</td>
<td>210</td>
<td>7</td>
</tr>
<tr>
<td>Techno-chemical control, quality assessment and safety of meat and dairy products / Techno-chemical control, quality assessment and safety crop production</td>
<td>270</td>
<td>9</td>
</tr>
<tr>
<td>Theoretical fundamentals of food technology / Grain science and theoretical bases of processing industries / Basic technologies for advanced processing of raw materials and biofuel production</td>
<td>420</td>
<td>14</td>
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<tr>
<td>Food merchandising / Elevator storage, processing and storage of crop products</td>
<td>180</td>
<td>6</td>
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<tr>
<td>Fundamentals research food / Conveying devices and ventilation systems of enterprises for storage and processing of grain</td>
<td>150</td>
<td>5</td>
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<tr>
<td>Physical methods of processing meats and dairy products / Technology of postharvest processing of grain and grain drying</td>
<td>270</td>
<td>9</td>
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<td>3 Cycle of major disciplines (MD) (disciplines list according to EP Working Curriculum)</td>
<td>1800</td>
<td>60</td>
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<tr>
<td>1) Academic component</td>
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<td>Management</td>
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<td>Occupational Health</td>
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<td>3</td>
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<tr>
<td>Enterprise economy and business</td>
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<td>3</td>
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<tr>
<td>industrial practice</td>
<td>540</td>
<td>18</td>
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<tr>
<td>20) component of choice</td>
<td></td>
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<tr>
<td>Designing of the enterprises of food production / Designing of the enterprises for processing of vegetable raw materials and biofuels</td>
<td>240</td>
<td>8</td>
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<tr>
<td>Technology of milk and dairy products / technology of bread and pasta</td>
<td>300</td>
<td>10</td>
</tr>
<tr>
<td>Technology meat and meat products / Technology of</td>
<td>300</td>
<td>10</td>
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<td>---------------------------------------------------------------------------------------</td>
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<tr>
<td>flour, cereals and fodder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology of catering product / Technology of vegetable oils</td>
<td>150</td>
<td>5</td>
</tr>
<tr>
<td>5 Additional types of learning (AL)</td>
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<td>0</td>
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<tr>
<td>1) optional component <em>(military training and other educational activities, determined by the student independently)</em></td>
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<td>0</td>
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<td>5 Final accreditation</td>
<td>360</td>
<td>12</td>
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<td>1) Design and defense of the thesis (project)</td>
<td>360</td>
<td>12</td>
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<td><strong>Total</strong></td>
<td><strong>7200</strong></td>
<td><strong>240</strong></td>
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</table>
Appendix 1. Academic calendar

### Academic calendar for the 2019-2022 academic year

**Code and classification of training areas:** 6B072 - Manufacturing and processing industries

**Academic degree:** Bachelor of Engineering and Technology in the educational program 6B07201 - Food Technology

**Form of study:** Full-time (bachelor 4 years)

<table>
<thead>
<tr>
<th>Course</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
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<td>10</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

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**Th - presentation week**

**●** - theoretical training

**FR** - landmark control

**C** - examination session

**JK** - summer semester

**УТ** - educational practice

**ПР** - internship

**ТР** - technological practice

**УИ** - undergraduate practice

**ЗД** - record for the

**3C** - lettering, Ex

**K** - holidays

**BC** - military training

**Д** - graduation design

**О** - defense of the thesis (project)

### Holidays:

- **August 30 - Constitution Day**
- **July 31 - Kurban Bayram**
- **December 1 - Day of the First President**
- **December 16, 17 - Independence Day**
- **January 1, 2 - New Year**
- **January 7 - Christmas**

### Total weeks:

- theoretical training - 30 weeks
- exam session - 6 weeks
- water holidays - 2 weeks
- summer vacation - 9-13 weeks
- summer semester - 6 weeks
<table>
<thead>
<tr>
<th>№</th>
<th>Модуль/тема</th>
<th>Виды занятий</th>
<th>Контингент</th>
<th>Объем занятий</th>
<th>Семестровые студенты</th>
<th>Вид аудиторной деятельности</th>
<th>Семестры</th>
<th>Баллы</th>
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<tbody>
<tr>
<td>1</td>
<td>Техног.</td>
<td>Лекция</td>
<td>ОСХ</td>
<td>30 ч</td>
<td>3 ч</td>
<td>3 ч</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Матем.</td>
<td>Лекция</td>
<td>ОСХ</td>
<td>30 ч</td>
<td>3 ч</td>
<td>3 ч</td>
<td>3</td>
<td>30</td>
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### Содержание модуля

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- **Электронные ресурсы**: [Ссылка]
- **Перечень литературы**: [Ссылка]

#### 2. Тесты и задания

- **Тест 1**: [Ссылка]
- **Тест 2**: [Ссылка]

#### 3. Дополнительные комментарии

- Учебный план разработан в соответствии с требованием...
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<th>ГД</th>
<th>РУ</th>
<th>КК</th>
<th>КИ</th>
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<th>ФИО</th>
<th>Организация</th>
<th>Специальность</th>
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<th>Ведущий преподаватель</th>
<th>Дисциплина</th>
<th>Тип транзакции</th>
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<td>КК</td>
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<td>ЭК</td>
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<td>ТК</td>
<td>КК</td>
<td>КИ</td>
<td>ЭК</td>
<td>ОК</td>
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<td>ТК</td>
<td>КК</td>
<td>КИ</td>
<td>ЭК</td>
<td>ОК</td>
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<td>Организация</td>
<td>Специальность</td>
<td>Количество часов</td>
<td>Ведущий преподаватель</td>
<td>Дисциплина</td>
<td>Тип транзакции</td>
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</tr>
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</table>

**Белый квадрат:** Белые нули

**Black description:** Black numbers

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**Конец текста:** End of text
<table>
<thead>
<tr>
<th>Код</th>
<th>Название предмета</th>
<th>Учебная аудитория</th>
<th>Группа</th>
<th>Количество аудиторных занятий</th>
<th>Профессор</th>
<th>Место в календаре</th>
<th>Примечание</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>Программирование</td>
<td>КК12 03.03.02</td>
<td></td>
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<tr>
<td>1</td>
<td>Математический анализ</td>
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<td></td>
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<td>12.00</td>
<td>12.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td>КК12 03.03.02</td>
<td></td>
<td>3600</td>
<td>12.00</td>
<td>12.00</td>
<td></td>
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<tr>
<td>3</td>
<td>Математический анализ</td>
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<td>3600</td>
<td>12.00</td>
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<tr>
<td>4</td>
<td>Математическое моделирование</td>
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<td></td>
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<td>5</td>
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<td>6</td>
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<tr>
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<td>1,000.00</td>
<td>2,000.00</td>
<td>2,000.00</td>
<td>2,000.00</td>
<td>2,000.00</td>
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</tr>
<tr>
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<td>888.00</td>
<td>144.00</td>
<td>72.00</td>
<td>291.00</td>
<td>1,164.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>27.00</td>
<td>2,916.00</td>
<td>888.00</td>
<td>144.00</td>
<td>72.00</td>
<td>291.00</td>
<td>1,164.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>13.00</td>
<td>2,136.00</td>
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<td>108.00</td>
<td>54.00</td>
<td>213.00</td>
<td>852.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
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<td>2,368.00</td>
<td>708.00</td>
<td>118.00</td>
<td>59.00</td>
<td>236.00</td>
<td>952.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>7.00</td>
<td>2,916.00</td>
<td>888.00</td>
<td>144.00</td>
<td>72.00</td>
<td>291.00</td>
<td>1,164.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>1.00</td>
<td>2,880.00</td>
<td>864.00</td>
<td>144.00</td>
<td>72.00</td>
<td>288.00</td>
<td>1,152.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>12.00</td>
<td>2,368.00</td>
<td>708.00</td>
<td>118.00</td>
<td>59.00</td>
<td>236.00</td>
<td>952.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
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<td>2,916.00</td>
<td>888.00</td>
<td>144.00</td>
<td>72.00</td>
<td>291.00</td>
<td>1,164.00</td>
</tr>
<tr>
<td>Number of credits in GES</td>
<td>1.00</td>
<td>2,880.00</td>
<td>864.00</td>
<td>144.00</td>
<td>72.00</td>
<td>288.00</td>
<td>1,152.00</td>
</tr>
</tbody>
</table>
## Appendix 3 Description of discipline of obligatory and academic components

<table>
<thead>
<tr>
<th>507301011. Basic information about the discipline</th>
<th>Kazakh</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>10</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Theoretical and practical skills corresponding to the basic levels of A1, A2</td>
</tr>
<tr>
<td>4. Post-requisites:</td>
<td>Professional Kazakh</td>
</tr>
<tr>
<td>5. Competencies:</td>
<td>A Study of the linguistic system of the Kazakh language and its ways through cultural and intercultural activities, improving language skills language learners on the basis of texts on everyday, socialization nym topics formation of lexical and grammatical skills</td>
</tr>
<tr>
<td>6. Course developers</td>
<td>Chair of Kazakh and Russian languages</td>
</tr>
</tbody>
</table>

### Name of the discipline

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Russian</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>10</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>School course of the Russian language and literature</td>
</tr>
<tr>
<td>4. Post-requisites:</td>
<td>Professional Russian</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Have basic communication skills in Kazakh / Russian languages: understand, express, interpret concepts, thoughts, feelings, facts and opinions both verbally</td>
</tr>
</tbody>
</table>
and in writing (listening, speaking, reading, writing) in the relevant range of social and cultural contexts. Competently execute business documentation and conduct business correspondence. Have an idea about working with scientific text.

6. Author of the course

Department of Kazakh and Russian languages

7. Basic literature

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

8. The content of the discipline

|                                                                                           |

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Foreign language</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>10</td>
</tr>
<tr>
<td>3. Pre-requisites:</td>
<td>Foreign language school course</td>
</tr>
<tr>
<td>4. Post-requisites:</td>
<td>Professionally oriented foreign language, English language (optional)</td>
</tr>
<tr>
<td>5 Competences:</td>
<td>According to the results of mastering the program, the student has the following competencies: 1) systematizes the conceptual foundations of understanding the communicative intentions of a partner, authors of texts at this level; 2) compares and selects the forms and types of speech / communication corresponding to the communicative intention with a logical construction adequate to the type of speech; 3) adequately express their own communicative intentions with the correct selection and appropriate use of the appropriate language means, taking into account their compliance with the socio-cultural norms of the language being studied; 4) classifies the levels of use of real facts, references to authoritative opinion;</td>
</tr>
</tbody>
</table>
verbal behavior is communicative and cognitively justified;
5) reveals the patterns of development of a foreign language, paying attention
to the study of stylistic originality;
6) owns the techniques of linguistic description and analysis of causes and
effects of events in texts of a scientific and social nature;
7) express possible solutions of modern problems in a foreign language based
on the use of reasoned information;
8) use evidence language material with reasoned language means sufficient for
this level, promptly and independently correct mistakes made with 75% error-
free statements;
9) owns the strategy and tactics of building a communicative act, correctly
intonationally forms the speech, based on lexical sufficiency within the
framework of speech topics and grammatical correctness.

<table>
<thead>
<tr>
<th>6. Author of the course</th>
<th>Department of Foreign Languages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3. ArlineBurgmeier, Lawrence J. Zwier, Bruce Rubin, Kent Richmond. Inside</td>
</tr>
<tr>
<td></td>
<td>University Press. - 2010.</td>
</tr>
<tr>
<td></td>
<td>5. British National Corpus: <a href="http://www.natcorp.ox.ac.uk">http://www.natcorp.ox.ac.uk</a></td>
</tr>
</tbody>
</table>

8. Content of the discipline
Level A1-B1 (semester)
11 Greeting.
2. My family.
3. My home.
4. Food
5. Purchase.
6. Man and his health.
7. Sport in human life.
8. Leisure
9. Native country and SIA.
10. Daily routine
11. World map.
12 Protecting the environment.
14. Famous universities of the world.
15. Modern study and modern gadgets.
Level A1-B1 (2 semester)
1. Family in modern society.
2. Family budget.
3. Types of housing.
4. Modern design.
5. Recreation organization
6. Travel, travel agency
7. Spiritual revival.
8. State and political structure.
9. State and political structure.
11. The education system in Kazakhstan.
12. The education system in SIA.
13. Future profession.
15. Demand for the chosen profession.

**Level A2-B1 (1 semester)**
1. I and my family.
2. Modern young family.
3. Relationships between representatives of different generations.
4. My home is my fortress
5. Man and his health
7. Leisure and hobbies
8. *Native country and SIA*
9. Native country and country / countries of the studied language, geographical location, climate, weather, capital
10. Sights of cities of Kazakhstan and the country of the studied language.
11. Customs and Traditions.
12 Traditions and customs of the country of the language being studied
13 Cultural and national holidays
15. Future profession.

**Level A2-B1 (1 semester)**
1. *Family in modern society*
2. Young family budget and main expenditure items
3. Housing construction; housing types
4. Modern design; architecture; home improvement; interior decoration;
5. Active, passive rest; Tourism
6. Leisure and Recreation
7. Cultural and historical background of the national symbols of countries
8. Political organization, economic sectors
9. National, state, professional and other holidays
10. Historical significance of these holidays
11. Education system in Kazakhstan and SIA
12. University choice, specialty, enrollment standards, education trajectory, individual curriculum
13. Future profession, professional competence
14. Advantages and disadvantages of various professions
15. Demand for selected professions on the labor market

**Level B1-B2 (1 Semester)**
1. Family in modern society.
2. The budget of a young family.
3. Types of housing (urban, rural house, apartment).
4. Modern design.
5. Vacation planning.
6. Tourism; rest and recovery; entertainment.
7. Spiritual Revival (Ruhanizakyru)
8. Cultural and historical background of the national symbols of the Republic of Kazakhstan and SIA.
9. Government, legal institutions of the Republic of Kazakhstan and SIS.
10. Sectors of economy of RK and SIA.
12. Holidays of the country of the studied language.
13. Nauryz - the holiday of the birth of spring!
15. SIA: Festive rituals, cultural projects. Traditions and customs.
2 Semester)
2. Environmental problems.
3. Scientific and technical progress.
4. Scientific and technical progress.
5. World media.
6. Advertising.
7. Art, music, literature of the Republic of Kazakhstan and the country of the studied language.
8. Outstanding cultural figures of the country of the language being studied.
10. The education system in the country of the language being studied.
11. Choosing a university.
12. Professional competence.
13. Advantages and disadvantages of the chosen profession.
14. The demand for the chosen profession in the labor market.
15. Wage.

### 11. Basic information about the discipline:

<table>
<thead>
<tr>
<th><strong>name</strong></th>
<th>Philosophy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2. Number of credits</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>3. Prerequisites:</strong></td>
<td>Sociology, political science, cultural studies, psychology, Modern history of Kazakhstan.</td>
</tr>
<tr>
<td><strong>4. Post requisites:</strong></td>
<td>History and philosophy of science, philosophy of modern society.</td>
</tr>
<tr>
<td><strong>5. Competences:</strong></td>
<td>Formation of openness of consciousness, understanding of one's own national code and national self-consciousness, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education.</td>
</tr>
<tr>
<td><strong>6. Author of the course</strong></td>
<td>Department of Philosophy</td>
</tr>
</tbody>
</table>

### 11. Basic information about the discipline:

<table>
<thead>
<tr>
<th><strong>Name of the discipline</strong></th>
<th>Culturology and psychology</th>
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</thead>
<tbody>
<tr>
<td><strong>2. Number of credits</strong></td>
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<tr>
<td><strong>3. Prerequisites:</strong></td>
<td>Basic school knowledge</td>
</tr>
<tr>
<td><strong>4. Post requisites:</strong></td>
<td>Philosophy, Philosophy</td>
</tr>
</tbody>
</table>
5. **Competences:**
Developed as the basis for cultural identity, the ability to analyze and assess cultural situations based on an understanding of the nature of cultural processes, the specifics of cultural objects, the role of cultural values in intercultural communication.
Increasing the general psychological culture, mastering the knowledge of the socio-psychological patterns of individual behavior in interpersonal communication necessary for the modernization of consciousness in accordance with the challenges of time in the context of the program of the Spiritual Revival of Kazakhstan, the Leader of the Nation Nazarbayev.

6. **Author of the course**
Department of Philosophy

7. **Basic literature**
1. S. Dzhakupov "Introduction to general psychology." - A.: Kazak University, 2014

8. **Content of the discipline:** The morphology of culture. The language of culture. Culture of nomads of Kazakhstan. Cultural heritage of the Turks. The formation of the Kazakh culture. Personality in the context of the formation of national consciousness in psychology. Interpersonal communication as a factor in the development of a harmonious personality of Kazakhstan. Technology effective interpersonal communication as the basis for the modernization of public consciousness.

11. **Basic information about the discipline:**

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Political science and sociology</th>
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</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>4</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Basic school knowledge</td>
</tr>
<tr>
<td>4. Post-requisites:</td>
<td>Philosophy, history and philosophy of science</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Formation of the ability of a critical understanding of the system of interpersonal relations in society, awareness the nature of society, the system of its groups, institutions. Formation of the socio-humanitarian outlook as the basis for the modernization of public consciousness through knowledge of the laws and laws of world politics and modern political processes, as well as the formation of national and civic identity.</td>
</tr>
<tr>
<td>6. Author of the course</td>
<td>Department of Philosophy</td>
</tr>
<tr>
<td>8. Content of the discipline:</td>
<td>Sociology in understanding the social world. Introduction to the</td>
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</tbody>
</table>

11. Basic information about the discipline:

<table>
<thead>
<tr>
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<th>Modern history of Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>5</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>School basic knowledge</td>
</tr>
<tr>
<td>4. Postrequisites:</td>
<td>Culturology, political science, philosophy, sociology</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>know the prerequisites for the formation of the statehood of modern Kazakhstan at the source of world and Eurasian historical processes; be able to critically analyze historical events, based on retrospective, comparative-historical and other scientific methods, have the skills to compare them with the world development of mankind; master the skills of analyzing the activities of historical personalities of modern Kazakhstan, complex historical processes and phenomena; fully take into account the priorities of a kind of Kazakhstan development, its features, etc.</td>
</tr>
<tr>
<td>6. Author of the course</td>
<td>Department of History of Kazakhstan</td>
</tr>
<tr>
<td>8. The content of the discipline: Features and specific historical processes, the formation of the patriotic spirit of the students. The study of the specifics of the subject and methods of historical culture. Discipline The history of modern Kazakhstan is based on theoretical and methodological concepts. To clarify the chronological framework for the independence of Kazakhstan, priority is given to national ideas and movements.</td>
<td></td>
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</table>

1. Basic information about the discipline:

<table>
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<tr>
<th>Name of the discipline</th>
<th>Information and communication technologies</th>
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</thead>
<tbody>
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<td>2. Number of credits</td>
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<tr>
<td>3. Prerequisites:</td>
<td>Mathematics, Physics</td>
</tr>
<tr>
<td>4. Postrequisites:</td>
<td>Designing food production enterprises / Designing enterprises processing vegetable raw materials and producing biofuels</td>
</tr>
<tr>
<td>5. Competences: As a result of studying students in this discipline will be able to:</td>
<td>- design and create simple websites; - to process vector and raster images; - create multimedia presentations; - use different social platforms for communication;</td>
</tr>
</tbody>
</table>
6. Author of the course
Department of Information and Communication Technologies

7. Basic literature


<table>
<thead>
<tr>
<th>Name of Discipline</th>
<th>Physical education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of credits</td>
<td>8</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Biology, Anatomy, Human Physiology, Hygiene, Medical Control, Valeology, Pedagogy, Psychology</td>
</tr>
<tr>
<td>Postrequisites</td>
<td>The program of the Physical Culture course develops skills and abilities in the field of physical culture of students, forms the need for a healthy lifestyle, preservation and strengthening of health, improves the level of physical fitness for the realization of their abilities in the course of daily activities</td>
</tr>
<tr>
<td>Competence</td>
<td>Provision sufficient level of physical readiness of future specialists, a high level of efficiency; development of professionally significant physical and psychomotor abilities; possess methods and means of physical culture to increase the body's adaptation reserves and promote health; possess knowledge and skills of a healthy lifestyle, ways to preserve and promote health and use them to preserve health</td>
</tr>
<tr>
<td>The author of the course is</td>
<td>Shkurkov A.S., Satbayev E.K.</td>
</tr>
</tbody>
</table>
| Basic literature   | 1. V.I. Ilyinich. Physical education student. Moscow, 2001  
| Content of the discipline | Formation of a positive attitude, interest and need for physical education and sports. Improving the physical health of students on the basis of increasing the arsenal of motor abilities, professional-applied and methodical readiness. Preparation and participation in mass sports and recreational events and competitions in sports, providing for the wide involvement of students in active physical education. Comprehensive use of physical culture and sports as a general |
physical training. Increase the level of physical and functional status. Preventive use of physical culture for health purposes. The acquisition by students of additional, necessary knowledge of the basics of psychological, pedagogical, medical and biological control according to the method and organization of independent exercise and "lifelong" sports.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Environmental safety in the agricultural sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of credits</td>
<td>5</td>
</tr>
</tbody>
</table>

Prerequisites: School course of geography, ecology

Post requisites: Labor protection

5. Competences:

As a result of studying the discipline, students should have general information about the classification of natural resources. To be able to assess the natural resource potential of the territory and certain types of natural resources; Know the main sources of environmental pollution, the composition of pollutants and their quantitative assessment of the activities of agricultural enterprises; Master the methods of assessment and calculation of the quality standard of the main environmental pollutants;

Get acquainted with the methods of cleaning gas and dust emissions from enterprises of the agro-industrial complex. Know the modern methods of environmental protection.

Explore the latest methods of greening production for the rational use of natural resources. To put into practice the main directions of environmental control and monitoring of environmental pollution.

6. Author of the course

7. Basic literature


8. Content of discipline: Formation of knowledge in the field of technological impacts of agro-industrial enterprises on the environment. Ideas about the main sources of pollution, the composition of pollutants and their quantification. Determination of the degree of anthropogenic pollution of the environment Determination of environmental quality at different environmental levels. The study of methods of environmental monitoring and monitoring of environmental pollution. The study of the main directions of greening and optimization of agro-industrial resource consumption.
<table>
<thead>
<tr>
<th>1. Basic information about the discipline:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the discipline</td>
<td>Mathematics</td>
</tr>
<tr>
<td>2. Number of credits</td>
<td>6</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>School course, Mathematics</td>
</tr>
<tr>
<td>4. Postrequisites:</td>
<td>Equipment for food production, Equipment for deep processing of raw materials and production of biofuels, Processes and apparatuses for food, Processes and devices processing industries</td>
</tr>
<tr>
<td>5. Competence:</td>
<td>Develop an understanding of the physical phenomena occurring, the ability to be used in the practice of scientific research about physical concepts and mathematical processes at ode, on ways and methods of their description, the basic principles, laws and theories of classical and modern physics and mathematics. Possession of techniques and methods for solving specific problems from various fields of physics and mathematics.</td>
</tr>
<tr>
<td>6. Author of the course</td>
<td>-</td>
</tr>
<tr>
<td>8. The content of the discipline</td>
<td>Methods of Mathematics, about its role in the development of other sciences. The use of mathematical methods. Basic definitions, theorems, rules, mathematical methods and practical application. Practical skills in solving problems on all topics covered by the program.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1. Basic information about the discipline:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the discipline</td>
<td>Chemistry</td>
</tr>
<tr>
<td>2. Number of credits</td>
<td>5</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>School course Chemistry</td>
</tr>
<tr>
<td>4. Postrequisites:</td>
<td>Theoretical basis of food technology</td>
</tr>
</tbody>
</table>
| 5. Competences: | The task of studying chemistry is to accumulate a specific amount of knowledge on the discipline and forming this basis of logical “chemical” thinking, which provides the future specialist with a free orientation in the information flow and the ability to solve problems related to knowledge of chemistry.  
The knowledge gained in chemistry helps the future specialist of the agricultural sector to solve problems of increasing crop yields, which are related to the study of the composition of the soil, the definition of macro- and microelements in them.  
After the chemical experiments performed, the student should further generalize the results obtained, draw a conclusion from the obtained data. |
| 6. Author of the course | - |
| 8. Contents of the discipline: | Basic methods and principles of chemistry, physical and chemical research methods, basic laws and limits of their applicability. The application of theoretical knowledge to solve specific chemical problems and situations. Analysis of the results of chemical processes. Conducting chemical experience, working with chemical devices and reagents. |
### 1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>name</th>
<th>Physics</th>
</tr>
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</table>

### 2. Number of credits

<table>
<thead>
<tr>
<th>credits</th>
<th>4</th>
</tr>
</thead>
</table>

### 3. Prerequisites:

Physics school course

### 4. Postrequisites:

Equipment for food production, Equipment for deep processing of raw materials and biofuel production, Processes and apparatuses for food, Processes and apparatuses for processing productions

### 5. Competences:

As a result of mastering the discipline, the student must know the basic physical phenomena and laws; basic physical quantities and constants, their definition. To be able to apply physical and mathematical methods to solve practical problems. Possess the concepts, laws and theories of the foundations of modern physics, methods of physical research, own methods of solving applied problems from various fields of physics.

### 6. Author of the course

- 

### 7. Basic literature


### 8. Content of the discipline

The application of theoretical knowledge to solve specific physical problems and situations. Analysis of the results of a physical experiment. Simulation of physical situations using a computer. Conducting a physical experiment, working with measuring devices. Calculation and processing of the data. Basic physical theories and principles, physical research methods, the basic laws and limits of their applicability.

### 1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>name</th>
<th>Microbiology</th>
</tr>
</thead>
</table>

### 2. Number of credits

<table>
<thead>
<tr>
<th>credits</th>
<th>4</th>
</tr>
</thead>
</table>

### 3. Prerequisites:

Chemistry

### 4. Postrequisites:

Biochemistry of esophagus products, Technochemical control, appraisal and safety food products, Technochemical control of agrochemicals

### 5. Competence:

Know the nature and diversity of microbiological processes in food production; advances in food technology.

Use in practice the skills and abilities in the operation of the main microbiological instruments and equipment of food production, own the technology of food production.

The ability to analyze, evaluate and form conclusions based on research by integrating knowledge of the fundamental or applied areas of food microbiology.

### 6. Author of the course

- 

### 7. Basic literature

3. Black JG and Black LG-Microbiology: John Wiley & Sons Singapore
8. **Content of the discipline** Basic information about the place of prokaryotes among living organisms, about the morphology, physiology and genetics of microorganisms, as well as about the metabolism in the microbial cell. General characteristics of viruses. The use of microorganisms and their metabolites in the food industry. The influence of external factors on microorganisms. Conversion of nitrogen compounds by microorganisms. The concept of infection and immunity.

| 1. Basic information about the discipline: |  |
| name | Chemistry and biochemistry of food products |
| 2. Number of credits | 5 |
| 3. Prerequisites: | Chemistry |
| 4. Postrequisites: Technochemical | Fundamentals of technologies for deep processing of raw materials and biofuel production, control, quality assessment and food safety, Techno-chemical control grain processing enterprises. |
| 5. Competence: | Fundamental Chemistry and Biochemistry sections to the extent necessary for an understanding of the basic laws of biotechnological, physico-chemical and biochemical processes to development of technologies catering from vegetable and animal raw materials: general structure patterns into the cells of microorganisms, animals and plants its functioning at the molecular and above molecular levels; features of the chemical composition of a living organism; main metabolic and energy pathways; The role of proteins, lipids, carbohydrates, vitamins, enzymes in the metabolism and nutrition of humans and animals; general concepts and approaches adopted in biochemistry; biochemistry methods for quality control and food certification; the role of biochemical processes during storage and processing of food raw materials; the role of biochemistry in the improvement of technological processes in the food industry and the creation of new rational schemes and principles for the processing of raw materials. Applying food raw materials and food systems in accordance with the balanced diet according to the content of proteins, carbohydrates, lipids, vitamins, minerals and water; Apply biochemical methods to assess food raw materials; manage the processes of changing the chemical composition in order to obtain the desired properties of food systems; optimize the chemical composition of traditional and new food systems on the basis of a systematic approach to the development of food products; apply functional foods and modern food products. Professionally use organizational skills and conduct experimental research in standard and changing situations in future professional activities. Interpret information to make judgments about the biochemical phenomena of a living organism, taking into account social and scientific considerations; -use the methods of modern biochemical science, the ability to apply |
the obtained theoretical knowledge in professional activities. To substantiate the importance of food biochemistry for increasing plant productivity, improving the quality of agricultural products, industries processing vegetable raw materials; To make an independent search, analysis and evaluation of the research, the ability to be creative in professional activities, the ability to continue training in this field according to educational programs. In the independent use of modern developments in the production of food products;

6. Author of the course -

7. Basic literature

1. Ospanova S.G. Food biochemistry: study guide /, SG Ospanov - Astana 2004

8. Content of the discipline

Chemistry and biochemistry is one of the fundamental disciplines in the preparation of bachelor of food production. The goals and objectives of the discipline: the formation of the bachelor system, knowledge, skills and abilities in biochemistry, the acquisition of basic knowledge of technological processes; mastering the importance of a complex of knowledge about chemical nature and the transformation of substances in the body, preserving the quality and safety of food products necessary to meet human needs; Mastering the methods of analyzing the quality of raw materials, semi-finished products and the safety of finished products aimed at reducing the risk of the appearance of low-quality food products in the sphere of circulation.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>name</th>
<th>Professionally-oriented foreign language</th>
</tr>
</thead>
</table>

2. Number of credits

4

3. Prerequisites:

School course English, English

4. Post requisites:

English language (optional)

5. Competences:

Acquisition of the theoretical foundations of technology knowledge food products.
Learn the basics of cooking food using a special terminology in English.
Acquisition of skills for understanding special topics and the ability to discuss topical issues in English.
Analyze the results obtained in practice thanks to the acquired theoretical knowledge of the subject in English.

6. Author of the course

-

7. Basic literature


8. Content of the discipline

Theory of verbal communication, phonetic, spelling, lexical, grammatical norms of a professionally-oriented foreign language. Introductory, search, study and viewing reading. The sequence of presentation of thoughts, reasoning, translation of texts in the
1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>name</th>
<th>Professional Kazakh (Russian) language</th>
</tr>
</thead>
</table>

2. Number of credits

| credits | 3 |

3. Prerequisites:

| Kazakh (Russian) |

4. Post requisites:

- 

5. Competences:

- A. Acquisition of theoretical principles of knowledge in the field of food technology.
- B. Learning the basics of cooking food using special terminology in the Kazakh (Russian) language. Acquisition of skills for understanding special topics and the ability to discuss thematic issues in Kazakh (Russian).
- C. Analyze the results obtained in practice thanks to the acquired theoretical knowledge of the subject in the Kazakh (Russian) language.

6. Author of the course

- 

7. Basic literature


8. The content of the discipline

Norms of the Kazakh language on the profile of the specialty. Sense-structural features of texts of various functional styles. Communication skills and speech skills when reading texts in the specialty. Monologue and dialogic speech. Characteristics of the correctness of speech and the system of norms of professional language. Analysis of own speech errors.

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1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>name</th>
<th>English (optional)</th>
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</table>

2. Number of credits

| credits | 3 |

3. Prerequisites:

| School course English, English |

4. Post requisites:

| Professionally-oriented foreign language |

5. Competences:

General scientific terminology and terminological sublanguage of the corresponding specialty in a foreign language - the basics of business correspondence in the framework of international cooperation;
To read, translate original literature on the chosen specialty with the subsequent analysis, interpretation and evaluation of the extracted information - to participate in professional discussions, scientific debates, debates, round-table discussions, - to give a presentation of scientific research (at seminars, conferences, symposia, forums)
- to listen and understand public speaking with direct and mediated communication (lectures, reports, television and Internet programs);
Oral communication in the specialty in the form of monologue, dialogue / polylogue (report, message, discussion, debate, debate, round table discussions),
- preparation of written forms of presentation of information material in the specialty message, poster report, abstract); lexicographic sources in a foreign language (traditional and on-line); - extract the necessary information from academic texts. - to understand the main idea of academic texts and specialty texts. - use of modern approaches to the study of the foreign language (national corpus of foreign languages).
6. Author of the course

Foreign language department

7. Basic literature


8. Content of the discipline

The content of the module is focused on continuing to learn a foreign language, improving the base created at the previous level, and is thus closely related to the discipline "Foreign Language" and aims to acquire future specialists in the language for professional and academic purposes at the initial level, that will allow to operate the scientific and conceptual apparatus of the specialty, to expand the scientific and information base, to master the skills of interpretation of information, argumentation, persuasion, academic second language. The main goal of teaching a foreign language to this module is to systematically deepen communicative competence within the framework of international standards of foreign language education based on further developing the skills and abilities of active language proficiency in the professional activities of a future specialist.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Descriptive geometry and engineering graphics</th>
</tr>
</thead>
</table>

2. Number of credits

3

3. Prerequisites:

School course of subjects of drawing, mathematics

4. Postrequisites:

Automation of the execution of drawings

5. Competences:

Ability to use the solution of various positional, metric and combined tasks on the complex drawing and in the visual image.

Acquisition of practical skills of work and reading, implementation of drawings in the specialty.

When studying a course, a student should know:

- methods for obtaining images of elements of space on a plane or surface;

- methods for solving spatial problems using images;

- the requirement of standards ESKD, USTD and other systems related to the implementation of the drawings.

6. Author of the course

- 

7. Basic literature

8. **Content of the discipline.** Teaching the future bachelor with the theoretical and practical basics of descriptive geometry and engineering graphics, the ability to solve spatial geometric engineering problems of a flat image of objects.

<table>
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<tr>
<th>1. Basic information about the discipline:</th>
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<tbody>
<tr>
<td><strong>Name of the discipline</strong></td>
<td>Applied mechanics</td>
</tr>
<tr>
<td><strong>2. Number of credits</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>3. Prerequisites:</strong></td>
<td>School course in physics, mathematics</td>
</tr>
<tr>
<td><strong>4. Postrequisites:</strong></td>
<td>Technological machines and equipment of processing industries</td>
</tr>
<tr>
<td><strong>5. Competences:</strong></td>
<td>Ability to use basic concepts and laws of mechanics, principles, arising from these laws to study the movement of the elements of machines, mechanisms, production equipment. Master the methods of calculating the equilibrium of mechanical systems, determining the kinematic characteristics and dynamic analysis of the motion of mechanical systems; on strength, rigidity and stability of typical structural elements working in tension and compression, shear, torsion, bending. The ability to use reference material necessary for carrying out engineering calculations. Have the skills to select the optimal size and shape of cross-sections of structural elements that provide the required reliability, safety and efficiency; and also graphic design of the results of calculation and design.</td>
</tr>
<tr>
<td><strong>6. Author of the course</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>8. Content of the discipline:</strong></td>
<td>Any device is designed on the basis of careful calculations and methods that are required to meet all accepted standards. The serviceability of the equipment and its durability depends on a properly designed structure, which requires in-depth technical knowledge. In this course, they study the theory of applied mechanics and master the skills of computational-experimental work. The program provides for solving problems of static and kinetics of a mechanical system, the choice of material, analysis and calculation of such equipment performance criteria as strength, rigidity and stability, calculation of mechanical gears and connections.</td>
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<tr>
<th>1. Basic information about the discipline:</th>
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</thead>
<tbody>
<tr>
<td><strong>Name of the discipline</strong></td>
<td>Automating the execution of drawings</td>
</tr>
<tr>
<td><strong>2. Number of credits</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>3. Prerequisites:</strong></td>
<td>Descriptive geometry and engineering graphics, Information and</td>
</tr>
</tbody>
</table>
### 4. Postrequisites:
Equipment for food production, Equipment for deep processing of raw materials and biofuel production, Design food production enterprises, Designing enterprises for processing vegetable raw materials and biofuel production.

### 5. Competences:
Know the elements of descriptive geometry and engineering graphics, the basics of automation theory, drawing execution, know the capabilities and applications of the KOMPAS -3D system, theoretical fundamentals and applied value of computer graphics, ways of displaying spatial forms on a plane, the capabilities of computing drawings.

To be able to use the knowledge and concepts of computer graphics, determine the geometric shape of the parts according to their images, understand the principle of operation of the structure shown in the drawing, build images of simple objects, carry out and read technical product drawings, develop methodological and regulatory documents, technical documentation, apply principles and techniques work with the computer graphics application program - KOMPAS -3D.

Possess the skills to solve practical problems of displaying graphical information (geometric modeling problems) using specialized software tools, skills in using the KOMPAS -3D program for creating drawings, illustrations in coursework and graduation design.

### 6. Author of the course
-

### 7. Basic literature

### 8. The content of the discipline.
The theoretical knowledge to application of create graphic images, display information, work basics in modern graphic tools of interactive computer graphics (creating 2D images in Compass). To determine the geometric shape of the parts from their images, the basis for solving problems of geometric modeling of graphical information in interactive graphic packages.

### 1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Standardization, metrology and certification of food industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>3</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Microbiology, Food Chemistry and Biochemistry</td>
</tr>
<tr>
<td>4. Postrequisites:</td>
<td>Technochemical control, quality assessment and safety of meat and dairy products</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Understanding of the main provisions of the state system for ensuring the uniformity of measurements. Mastering the basic scientific and methodological knowledge in the field of theoretical metrology. The ability to put into practice in various fields of activity knowledge in the field of technical measurements; mastering the methods of analysis and quality control of food during operation, repair of products. Formation of knowledge about the basic principles and provisions of certification in the Republic of Kazakhstan, the scope of certification, schemes</td>
</tr>
</tbody>
</table>
and systems of conformity assessment, the rules and procedures for confirming the conformity of products and services, scientific and technical support of certification, rules and procedures for confirming the conformity of quality systems.

<table>
<thead>
<tr>
<th>6. Course author</th>
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</table>

**8. The content of the discipline** Standardization, metrology and certification are inextricably linked, so studying them in one course gives students a more complete picture of the capabilities of each of these activities and their combination to compose a market economy in Kazakhstan.

### Appendix 4 Description of the disciplines of choice

<table>
<thead>
<tr>
<th>1. Basic information about the discipline:</th>
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<tbody>
<tr>
<td><strong>Name of the discipline</strong></td>
</tr>
<tr>
<td><strong>2. Number of credits</strong></td>
</tr>
<tr>
<td><strong>3. Prerequisites:</strong></td>
</tr>
<tr>
<td><strong>4. Postrequisites:</strong></td>
</tr>
</tbody>
</table>
| **5. Competences:** | To know the theory of the meat and dairy products.  
In the case of the implementation of the process, it should be noted.  
The structure of the apparatus of the apparatus, |
| **6. Author of the course** | - |


<table>
<thead>
<tr>
<th>1. Basic information about the discipline:</th>
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<tbody>
<tr>
<td><strong>Name of the</strong></td>
</tr>
<tr>
<td>discipline</td>
</tr>
<tr>
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</tr>
<tr>
<td>2. Number of credits</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
</tr>
<tr>
<td>4. Post requisites:</td>
</tr>
<tr>
<td>5. Competences:</td>
</tr>
<tr>
<td>6. Course author</td>
</tr>
<tr>
<td>8. The content of the discipline.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1. Basic information about the discipline:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Name of the discipline</td>
<td>Food Production Equipment</td>
</tr>
<tr>
<td>2. Number of credits</td>
<td>7</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Mathematics, Physics, Descriptive Geometry and Engineering Graphics, Applied Mechanics</td>
</tr>
<tr>
<td>4. Post requisites:</td>
<td>Processes and apparatuses of food products, Design of enterprises of food production</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Know the technological goals, theoretical foundations and engineering tasks of the main processes in the storage and processing of grain; purpose, scope, classification, principle of operation, structural device, technological characteristics, criteria for the selection of modern technological equipment; main scientific and technical problems and trends in the</td>
</tr>
</tbody>
</table>
development of technological equipment; basics of the theory of processes and methods for calculating process equipment; features of operation and maintenance of process equipment; basic safety regulations and environmental protection during the operation of technological equipment.

To be able to design technological equipment that meets the highest requirements; confirm with engineering calculations that the equipment conforms to the conditions of the technological process and the requirements of production; ensure technical operation and efficient use of process equipment; Have the skills to analyze the conditions and regulate the mode of operation of the process equipment; conduct research on the operation of equipment in order to optimize its modes of operation.

6. Course author

7. Basic literature


8. The content of the discipline


1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Equipment for deep processing of raw materials and biofuel production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>7</td>
</tr>
<tr>
<td>3. Prerequisites</td>
<td>Processes and devices of processing industries, Applied mechanics</td>
</tr>
<tr>
<td>4. Post requisites</td>
<td>Lifting and transporting equipment and ventilation systems of enterprises for storage and processing of grain, Designing enterprises for the processing of vegetable raw materials and the production of biofuels</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Students must know the classification, the main types, types, design features and the principle of operation of the equipment for the deep processing of plant materials and biofuels production. Students should be able to independently learn the structures, basic elements, principle of operation, advantages and disadvantages of equipment for the deep processing of vegetable raw materials and the production of biofuels for rational use of them in technological production schemes; Students should have the skills of rational use of equipment for the deep processing of plant materials and the production of biofuels in technological usage.</td>
</tr>
</tbody>
</table>
schemes in compliance with the requirements of technology.

6. Course author
Bekbaev K.S.

7. Basic literature

8. The content of the discipline. The study of classifications, structures, basic elements, the principle of operation of equipment for the deep processing of vegetable raw materials and the production of biofuels, as well as their rational use in technological schemes for processing products.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Technochemical control, quality assessment and safety of meat and dairy products</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>9</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Technology of meat and meat products, Physical methods of processing meat and dairy products, Technology of milk and dairy products, Food commodity research, Theoretical fundamentals of food technology.</td>
</tr>
<tr>
<td>4. Post requisites:</td>
<td>Designing food production enterprises, Diploma project (work).</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Know the technical requirements for agricultural products; quality and safety indicators of agricultural raw materials and products of its processing; main factors affecting the quality of agricultural products. To be able to apply regulatory and technical documents to assess the compliance of raw materials and products with their quality and safety requirements; perform the necessary types of analyzes; create practical conditions for compliance with the requirements of regulatory documentation for raw materials and products of its processing. Master the main methods of quality control of raw materials, materials and processed products at all stages of the technological process; methods of improving existing technological processes based on the analysis of the quality of raw materials and requirements for final products, skills for drawing up basic production control schemes.</td>
</tr>
<tr>
<td>6. Course author</td>
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</table>


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<thead>
<tr>
<th>1. Basic information about the discipline:</th>
</tr>
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<tbody>
<tr>
<td><strong>Name of the discipline</strong></td>
</tr>
<tr>
<td><strong>2. Number of credits</strong></td>
</tr>
<tr>
<td><strong>3. Prerequisites:</strong></td>
</tr>
<tr>
<td><strong>4. Post requisites:</strong></td>
</tr>
<tr>
<td><strong>5. Competences:</strong></td>
</tr>
<tr>
<td><strong>6. Course author</strong></td>
</tr>
</tbody>
</table>
8. The content of the discipline. Formation of graduates ability to methods of researching the quality of raw materials, semi-finished products, finished products and technological processes that will allow the bachelor to work successfully in his chosen field of activity, broaden his horizons, improve his professional skills and abilities, which will help to increase his competitiveness in the labor market.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Theoretical basis of food technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of credits</td>
<td>14</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Chemistry and biochemistry of food products, Microbiology.</td>
</tr>
<tr>
<td>4. Post requisites:</td>
<td>Technology of milk and dairy products, Technology of meat and meat products, as well as when writing a thesis project (work)</td>
</tr>
<tr>
<td>5. Competences:</td>
<td>Know the main food and biologically active substances of food raw materials and products, their properties and importance in nutrition, the classification of food raw materials, its properties, the technology of processing raw materials of animal and vegetable origin, physical and chemical processes occurring in food products during their processing. To be able to determine the quality of incoming raw materials; use regulatory and technical documentation; draw up technological schemes for the production of meat and dairy products; identify the constituent elements of food. Have the skills of students should acquire the necessary competence skills in more fully mastering the achievements of science, practice, technology of production of meat products, be able to work in a team and put forward their positions during the discussion of special topics; be able to analyze your knowledge and ability to self-education and self-development.</td>
</tr>
<tr>
<td>6. Course author</td>
<td>Baitukenova, SB, Zhakupova .N.</td>
</tr>
<tr>
<td>8. The content of the discipline. Introduction General information about nutrition. Metabolism. The main food and biologically active substances. Characteristics, structure and properties, the value of nutrition, the need and characteristics of absorption by the body of the consumer. The main quality characteristics, food, biological and energy value. The concept of quality, quality indicators. Organoleptic, physico-chemical indicators of food quality. Food Safety Indicators. Quality control. Rationing quality. Basics of technological processes.</td>
<td></td>
</tr>
</tbody>
</table>
Separation of heterogeneous systems. Thermal processes. Mass transfer processes. The main chemical transformations in the process of technological processing. Dispersed and colloidal systems.
The main chemical transformations in the process of technological processing. Factors affecting the rate of chemical reactions. The essence of individual chemical processes and their role in the food industry.

Biochemical basis of food production technology. Factors affecting the rate of biochemical processes. Structure, properties of enzymes and their classification. Sources of enzymes and the concept of enzyme preparations. The role of enzymes in the production and storage of food.
The role of microorganisms in food technology. The main groups of microorganisms used in the food industry. Types of energy metabolism in microorganisms. Factors regulating the metabolism of microorganisms. Industrial infection and disinfection


The theoretical basis for the storage of raw materials. Features of raw materials of animal and vegetable origin as storage facilities. Conditions, methods, storage modes. The processes occurring in food raw materials and products during cold processing. Ways and modes of refrigeration processing.


Fundamentals of food technology.

Fundamentals of technology of meat and fish products. Classification of meat and fish products. The main technological schemes for the production of meat and fish products. The main technological schemes for the production of meat products. The main technological schemes for the production of fish products.

The basics of food technology products and special purposes. Classification of food products. The main technological schemes of food production. Stages of the technological cycle and the principles of production of culinary and confectionery products. Cooking methods. Processes that form the quality of the finished product. Technological processes of culinary processing of raw materials, the preparation of semi-finished and finished products. Requirements for quality, rules for design and release, conditions and periods for storage and sale of culinary confectionery products.

Fundamentals of technology canned food and food concentrates. Classification of canned food and food concentrates. The main technological schemes of canning and food concentrates production. General technological methods used in the canning of fruits and vegetables. The main ways of influencing the microvluery of food products. Containers for canned The quality of canned fruits and vegetables. Types of marriage canned in sealed containers. The use of waste canning production.

General technology and processing of vegetable oils.
Characteristics of oilseeds.

Classification of vegetable oils and oil and fat products. The main technological schemes for the production of vegetable oils and oil and fat products. Margarine technology.

General technology of bread, pasta and confectionery.

General technology of sugar. Classification and assortment, nutritional value, quality indicators of sugar. General technological schemes for the production of granulated sugar, refined sugar, molasses, glucose-fructose syrups:

General technology of juicy vegetable raw materials. General principles of preserving juicy vegetable raw materials, bios, anabiosis, coenoanabiosis, abiosis. Characteristics of raw materials as a storage and processing facility, variety and growing conditions.

The chemical composition of the raw materials, the physical properties of the raw materials, the physiological characteristics of the raw materials.

Storage of juicy vegetable raw materials, as a method of canning

The general technology of food products: tea, coffee, tea and coffee drinks.

Classification and assortment, nutritional value, quality indicators of foodstuff products. General technological schemes for the production of tea and coffee.

The general technology of fermentation industries. Classification and range, nutritional value, quality indicators of malt. General technological schemes for the production of drinking water and soft drinks. General technological schemes for the production of beer and kvass. General technological schemes for the production of ethyl alcohol and alcoholic beverages. General technological schemes for the production of grape wines.

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<td>4. Post requisites:</td>
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<td>5. Competences:</td>
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compare, formulate conclusions on the quality of the received grain, choose the methods of post-harvest grain processing, choose the necessary modes of storage of grain masses acquire practical skills and experience of their further use in the grain, flour, bakery, confectionery and fermentation industries.

6. Course author
Yermekbayev Seitkamal Baimuratovich

7. Basic literature
5. Yermekbayev S.B. Ән жарнек ақынын бойынша зерткенанық практикум - KazATU, Astana, 2015.- 277 beta
7. Ermekbayev S.B. Құрылыс өндірісінің технологиясы (Оқұқ құрамы) - Astana: S.Seifullin Atyndagy CATU, 2016.-105 beta
8.Shkaluly Қ., Yermekbayev S.B. Біртұтас, шаңан астық оңдеу ұйымды оқу (Оқұқ құрамы) - Astana: S.Seifullin otyndanы ATU, 2016.-259 beta

8. The content of the discipline. The discipline "Grain science and the theoretical foundations of processing industries" It provides for students to acquire theoretical knowledge, practical skills and general information about grains, oilseeds and legumes, their morphological and anatomical structure, about those crops used in grain processing enterprises necessary in preparing bachelor in the areas of "Technology of food products". Besides studying the theoretical foundations of the following industries: technology of grain, flour, cereals, animal feed; production of bread, pasta and confectionery, preparation of confectionery products of various groups of sweets, marmalade, dragee, sugar production technology; starch and powder production technologies; fermentation technology; technologies for the production of alcoholic beverages.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Fundamentals of technologies for the deep processing of raw materials and biofuel production</th>
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<td>2. Number of credits</td>
<td>14</td>
</tr>
<tr>
<td>3. Prerequisites:</td>
<td>Processes and devices of processing industries, Equipment for deep processing of raw materials and production of biofuels</td>
</tr>
<tr>
<td>4. Post requisites:</td>
<td>Designing plants for the processing of vegetable raw materials and biofuel production</td>
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</table>
| 5. Competences:        | Students should know the main technological methods, features and principles of technologies for the deep processing of raw materials and biofuels for the subsequent application of competencies in the study of post requisites of disciplines.
Students should be able to draw up technological schemes, equipment layout and carry out calculations taking into account the features of production technologies for deep processing of raw materials and biofuels.
Students should have the skills to independently draw up technological schemes and rational organization of production, to develop recommendations for
improving the profitability of products for the deep processing of vegetable raw materials and the production of biofuels.

### 6. Course author
Bekbaev K.S.

### 7. Basic literature

### 8. Content of the discipline
Studying the classification, structures, basic elements, the principle of operation of equipment for the deep processing of vegetable raw materials and the production of biofuels, as well as their rational use in the processing flow diagram.

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<th>1. Basic information about the discipline:</th>
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<tr>
<td><strong>Name of the discipline</strong></td>
<td>Food Product Merchandise</td>
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<tr>
<td><strong>2. Number of credits</strong></td>
<td>6</td>
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<tr>
<td><strong>3. Prerequisites:</strong></td>
<td>Chemistry and biochemistry of food products, Microbiology.</td>
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<tr>
<td><strong>4. Post requisites:</strong></td>
<td>Physical methods of processing meat and dairy products, Technology of meat and meat products, Technology of milk and dairy products.</td>
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<tr>
<td><strong>5. Competences:</strong></td>
<td>Formation of students’ knowledge about the state of the modern market of food products, their quality and nutritional value, features of production and storage, and is aimed at developing a specialist in deep logical thinking and practical skills in conducting food quality assessment. The main directions, problems of development and the formation of the food market; subject, tasks, functions and methods of merchandising; chemical composition and nutritional value of food; classification and assortment of the main groups of food products; conditions and modes of storage, transportation and sale of various groups of food products; Factors that form the quality of food products and indicators that characterize it; requirements of regulatory and technical documentation for various types of food products; the procedure for the acceptance of food products; types of defects and deterioration of food products, as well as their causes; Use special and periodical literature; to assess the quality of food products using organoleptic and physico-chemical methods; analyze and give an opinion on the quality of food products in accordance with the requirements of state</td>
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</table>
standards; establish the type of damage and the cause of its occurrence, take measures to eliminate or prevent possible damage; to be guided in the accompanying documentation; provide the necessary conditions for the storage, sale, transportation of food products.

In a more complete mastery of the achievements of science, practice, merchandising of food products, research methods and be able to independently assess the raw materials and finished products; knowledge in the field of modern industry and current problems of food commodity merchandising.

6. Course author

7. Basic literature


8. The content of the discipline. The course consists of two sections. The first section outlines the theoretical foundations of merchandising. The main provisions, terms and definitions in this field of knowledge are given. The chemical composition, the nutritional value of food products, the factors determining them, the classification and coding of goods, assortment policy, product information are considered. Outlines the quality of goods and basic methods for determining quality indicators, examination of goods. In the 2nd section, consumer properties of individual groups of food products and raw materials, features of their formation and evaluation are considered.

1. Basic information about the discipline:

Name of the discipline
Elevator-warehousing and storage of crop production

2. Number of credits
6

3. Prerequisites:
Physics, Mathematics, Applied Mechanics, Descriptive Geometry and Engineering Graphics, Technology of post-harvest processing of grain and grain drying.

4. Post requisites:
Lifting and transporting equipment and ventilation systems for grain storage and processing enterprises, Designing enterprises for processing vegetable raw materials and producing biofuels.

5. Competences:
Knowledge:
- designs of granaries, technological equipment of grain-receiving enterprises;
- organization and conduct of post-harvest processing of crop production;
- basics of technological operations at all stages of the storage process;
- ice and operation of granaries, drying and cleaning towers.

- correctly evaluate the physico-chemical and technological advantages of crop production;
- develop technological methods for the organization and conduct of post-harvest processing;
- apply the storage modes of crop production;
- evaluate the effectiveness of the equipment at all stages of the process.

Making a judgment and possession of a certain opinion in the field of elevator storage, storage technology of crop production.

6. Course author
Tarabayev B.K., Ph.D., Art. teacher.

7. Basic literature

8. The content of the discipline. Classification of granaries and requirements for them, mechanics of bulk materials, site for construction, master plan for grain-receiving enterprises, post-harvest processing of crop products, grain warehouses and mechanized work towers, elevators, operational calculation of the elevator, technological features of modern elevators, shops and factories seed processing, warehouses for the storage of grain by-products, the operation of elevators and grain-receiving enterprises.

1. Basic information about the discipline:

<table>
<thead>
<tr>
<th>Name of the discipline</th>
<th>Fundamentals of Food Research</th>
</tr>
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</table>

2. Number of credits
5

3. Prerequisites:
Standardization, Metrology and Certification of Meat and Dairy Products, Food Commodity Research, Theoretical Foundations of Food Technology.

4. Post requisites:
Techno-chemical control, quality assessment and safety of meat and dairy products. Design of food production enterprises, are used to conduct research projects (term papers, course projects, graduation projects, theses, research reports, etc.).

5. Competences:
The quality of raw materials used in food production technologies; device technological equipment; chemical processes occurring in the processing of raw materials and the production of finished products.
Work with scientific, technical and reference books; use the latest scientific
advances to carry out research on issues facing the industry. Information on new developments in the field of food technology; technologies for the production of raw materials and finished food products; issues of technological processes modeling; research skills in food technology.

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<th>6. Course author</th>
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8. **The content of the discipline:** General information about science and research. Epistemological basis of scientific research. Organization of scientific research. Processing of scientific information, theoretical studies. Experimental studies. Experimental factor mathematical models. Plans for experiments and their properties, processing the results of the experiment. Registration of the results of scientific work and ways to inform the scientific community.

| 1. Basic information about the discipline: | Lifting and transporting equipment and ventilation systems for grain storage and processing enterprises |
|------------------------------------------|-------------------------------------------------------------------------------------------------
| 2. Number of credits | 5 |
| 3. Prerequisites: | Equipment for deep processing of raw materials and biofuel production, Grain science and theoretical foundations of processing industries, Fundamentals of technologies for the deep processing of raw materials and biofuel production |
| 4. Post prerequisites: | Designing enterprises for processing vegetable raw materials and biofuel production, labor protection, course and diploma design, production technology and pre-graduation practice, |
| 5. Competences: | Know the theoretical foundations of ventilation, pneumatic transport and lifting-transport installations with the basics of theories, calculation and design.  
Understand the design, device, principle of operation and the main technical characteristics of ventilation, pneumatic and hoisting-and-transport installations.  
To be able to sketch out the design and construction of machines, mechanisms, components and equipment of ventilation, pneumatic and hoisting-and-transport installations.  
To master the methods of performing calculations related to the design, testing and operation of ventilation, pneumatic and hoisting-and-transport installations. |
| 6. Course author | - |

8. **The content of the discipline.**

**Introduction:**
The role of lifting and transporting devices and pneumatic conveyors in the development of industry and agriculture. Application area. Classification and modes of operation, advantages and disadvantages of lifting and transporting devices and pneumatic conveyors.


Automobile, railway unloaders and loaders.


Ventilation and aspiration systems. Principles of design of ventilation and aspiration systems. Calculation of equipment for ventilation. Fundamentals of calculation and design of the supply and exhaust ventilation system.

Ventilation and pneumatic conveying installations of elevators and grain processing enterprises. Classification of equipment pnevmotransportnyh installations. Blowing machines. Detailed classification of equipment and devices of pneumatic transport installations with indication of the main types and brands of equipment used in the food industry. Blowing machines: types, principle of operation, advantages and disadvantages, basic parameters, methods of regulation.

The basic principles of the design of installations for pneumatic transport. Constructive solutions for pneumatic conveying systems. Intrashop systems of pneumatic transport of materials and wood waste. Interdepartmental pneumatic conveying systems for materials and wood waste. The main equipment and air ducts for pneumatic transport systems. Constructive solutions for pneumatic transport systems.
conveying systems
Pickups. Feeding devices: types, principle of operation, advantages and disadvantages, basic parameters, methods of regulation.
The organization of complex mechanization of transporting and loading and unloading operations of a grain processing enterprise.

1. Basic information about the discipline:

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<tr>
<th>Name of the discipline</th>
<th>Physical processing methods of meat and dairy products</th>
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2. Number of credits

9

3. Prerequisites:
The theoretical basis of food technology, food production equipment.

4. Post requisites:

5. Competences:
Knows the areas of application of progressive physical methods and engineering rheology methods in food production technology; information of both theoretical and economic nature, substantiating technical solutions and the main methods of their calculation, safety and labor protection features.
It is able to determine the electrophysical, structural-mechanical, optical, acoustic characteristics of food products and establish a qualitative and quantitative relationship between them; make engineering calculations of processes and working bodies and select the appropriate equipment.
He has skills in technological and biochemical studies for the qualitative assessment of product properties.

6. Course author

-

7. Basic literature

4. This is an інімдерін ұлт-ретті қызметкер-химиялық және ұируемдәрдың негізгі: E 88 Оку құраллы / Б.К. Асенова, Ребезов MB, Амirkhanов K.Zh., Нургазеева A.N., Бакирова L.S. - Almaty, 2013. 130 b.

### 1. Basic information about the discipline:

<table>
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<tr>
<th>Name of the discipline</th>
<th>Technology of post-harvest processing of grain and grain drying</th>
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### 2. Number of credits

9

### 3. Prerequisites:

- Grain science and theoretical foundations of processing industries,
- Fundamentals of technologies for the deep processing of raw materials and the production of biofuels.

### 4. Post requisites:

- Designing enterprises for processing vegetable raw materials and biofuel production,
- Elevator-storage facilities and storage of crop products,
- Lifting-transport devices and ventilation systems of enterprises for storage and processing of grain,
- Technology of flour, cereals and animal feed.

### 5. Competences:

**Knowledge:**
- Basics of storing and drying grain;
- Organization and conduct of post-harvest grain processing at grain-receiving enterprises;
- Correctness of the technological operations at all stages of the process of storage and drying of grain;
- Technological, transport and weighing equipment used in elevators;
- Ice and work of elevators, drying and cleaning towers, mechanized grain stores and grain drying units;
- Cleaning technologies, active ventilation of the grain mass;
- Physiological processes occurring in the grain during storage and drying;
- Methods of substantiation of the regimes of drying of grain of various crops and calculations of drying installations.

**Skill:**
- Correctly evaluate the physico-chemical and technological advantages of grain and finished products;
- Develop technological methods for organizing and conducting post-harvest processing and drying of grain;
- Serve the modes of storage and drying of grain and products of its processing for the preservation of quality;
- Evaluate the effectiveness of the equipment at all stages of the technological process of processing and drying;
- The means of control and management of the technological process of storing and drying grain;
- Calculate the grain dryers and the necessary equipment of elevators;
- Correctly use the basics of production management in the field of storage and drying of grain.

### 6. Course author

Tarabayev B.K., Ph.D., Art. teacher.

### 7. Basic literature

5. The system of machines for the storage and processing of grain // under the general editorship of D.A. Shaimerdenova, V.V. RemleAstana, KazNIIPSHP, 2013. - 395 p.
7. Tarabayev B.K. Technological basis of recirculating drying of...
8. **The content of the discipline.** Grain like storage facility; characteristic of grain masses; the main operations with grain and seeds performed at the granaries; grain as a commodity and object of consumption; weighing equipment, weighing procedure and operation of scales; grain cleaning technology; grain drying and aeration installations; mine and chamber zernosushilki; recycling grain dryers; mobile grain dryers; continuous technological lines of granaries; features of technological lines for processing grain of various crops; equipment of environmental protection and fire and explosion safety.

1. **Basic information about the discipline:**

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<th>Name of the discipline</th>
<th>Management</th>
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2. **Number of credits**

3. **Prerequisites:**

4. **Post requisites:**

   Enterprise economics and entrepreneurship.

5. **Competences:**

   As a result of studying this discipline, undergraduates should:

   To know: the latest trends in the development of management in the current conditions; relationship "organization-external environment"; designing adaptive organizations in the face of change and innovation; the dynamics of organizational behavior, changes in the nature of leadership in modern conditions; modern approaches to motivation, identification of types of teams in organizations.

   be able to: analyze the relationship of the organization with a changeable external environment; implement highly efficient planning in a rapidly changing environment; distinguish between modern command and network structures; recognize the characteristics of effective leaders; develop integrated quality management concepts.

   possess skills: effective crisis management; ensuring the interaction of corporate culture and the external environment; developing three levels of organizational strategy; the use of models and methods to facilitate effective decision making in modern organizations; management of multicultural teams, application of modern approaches to motivation, implementation of communications in crisis situations, control and integrated quality management.

6. **Course author**

   Nukesheva A.Zh., Southpayev S.E., Balkibaeva A.M.

7. **Basic literature**


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<td>5. Competences:</td>
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8. The content of the discipline is the training of highly qualified specialists with deep theoretical and necessary practical knowledge and skills in the field of RT. Fostering in students a sense of responsibility for protecting the personal health of employees that graduates of the Kazakh Agrotechnical University will have to work with. From Seyfullin. Development of civil activity in this state important for the Republic of Kazakhstan business.
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<td>8. Content of the discipline.</td>
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<td>5. Competences:</td>
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8. The content of the discipline. Food industry design. Designing objects of food industry enterprises and enterprises of low meat and milk processing capacity. Feasibility studies for the construction or reconstruction of enterprises of the meat industry, the selection and justification of technical schemes, grocery calculation, calculation and selection of technological equipment, the layout of workshops and industrial buildings.
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<td><strong>8. The content of the discipline.</strong></td>
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<td><strong>4. Post requisites:</strong></td>
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5. Competences:

Know:
- general and special microbiology, the organization of sanitary and hygienic control of the production of milk and dairy products;
- biochemical and physico-chemical processes that occur during storage and milk processing;
- characteristics of the main and additional raw materials, auxiliary materials;
- technology and organization of production of milk and dairy products;
- method of technological calculations;
- technological machines, devices and production lines of food production;
- rational technological modes of operation of the equipment;
- organization of techno-chemical production control;
- quality indicators of the main raw materials, semi-finished products, finished products and methods for their determination;
- methods and criteria for assessing the nutritional value, safety of raw materials and food products;
- causes of marriage and defects in manufactured products

Be able to:
- determine the morphological, cultural, biochemical properties of various groups of microorganisms;
- conduct microbiological studies of milk and dairy products and evaluate the results obtained;
- determine the chemical composition and properties of milk and dairy products in the process of their production;
- select the necessary raw materials, equipment, parameters for a given process for reference materials;
- to carry out technological calculations for the production of milk and dairy products;
- to carry out the control of technological processes at all stages of production;
- conduct tests to determine organoleptic, physicochemical quality indicators of raw materials, semi-finished products, finished products;
- use the results of the control of raw materials, technological process, finished products to optimize the production of milk and dairy products.

Have skills:
- works with the main technological equipment of the dairy industry;
- development of technological schemes and formulation of dairy products;
- solving basic scientific and technical problems and prospects for the development of the production of milk and dairy products.

6. Course author

Zhakupova G.N., Baitukenova S.B.

7. Basic literature

8. The content of the discipline.
Microbiology of milk and dairy products:
- general microbiology: morphology and physiology of microorganisms; the influence of the external environment on the development of microorganisms; the spread of microorganisms in nature; the role of microorganisms in the transformation of substances in nature; special microbiology: microorganisms used in the production of dairy products; causative agents of spoilage (defects) of milk and dairy products; basics of industrial hygiene and sanitation at dairy enterprises; microbiology of raw, drinking milk, ferments, microbiology of dairy products, butter, cheese, canned milk and ice cream, raw dairy raw materials.
- Biochemistry of milk and dairy products: milk components, chemical, physical and technological properties of milk; changes in the chemical composition and properties of milk under the influence of various factors; biochemical and physico-chemical changes in the constituent parts of milk during storage and processing, in the production of fermented milk products and ice cream, cheese, butter, canned milk and whole milk replacer (milk replacer); biochemical basis of the production of children's dairy products; physical and chemical processes of production of casein, milk protein products and milk sugar.
- Technology and organization of production of milk and dairy products: classification of dairy products; specific raw materials and materials for the dairy industry; organization of preparatory work; the concept of dairy cattle breeding, obtaining high-quality milk, separation and normalization of milk; homogenization of raw milk; membrane methods of separation and concentration of milk raw materials; technology and organization of production of whole milk products: drinking milk and drinking cream (milk and cream with fillers); starter and bacterial preparations, liquid dietary dairy products, sour cream, curd and curd products, ice cream; technology of butter, cheese, canned milk, baby milk products, skimmed milk products, buttermilk and whey; the main directions in the development of the production technology of milk and dairy products; new product development; technological calculations in the production of milk and dairy products; current regulatory documents; technological process design; resource and energy saving technologies of milk and dairy products.

1. Basic information about the discipline:

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<th>Name of the discipline</th>
<th>Technology of bread and pasta</th>
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<th>2. Number of credits</th>
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<tr>
<th>3. Prerequisites:</th>
<th>Grain science and theoretical foundations of processing industries, technology of post-harvest processing of grain and grain drying, technology of flour, cereals and animal feed</th>
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<tr>
<th>4. Post requisites:</th>
<th>Designing plants for the processing of vegetable raw materials and biofuel production</th>
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<tr>
<th>5. Competences:</th>
<th>know: - methods of theoretical and experimental research in the field of chemistry of bread, confectionery and pasta, the technology of their production and processing using computational tools technology; - optimal and rational technological modes of operation of the equipment; - methods for analyzing the processes of storage of raw materials, production and processing of products in order to ascertain promising technological solutions for the construction, reconstruction or technical re-equipment of the industry; be able to: - improve and optimize existing technological processes based on a systematic approach to the analysis of the quality of raw materials, technological process and requirements for the final product; - carry out analysis of technological processes based on the use of a data bank</th>
</tr>
</thead>
</table>

of the development trends of these processes;
- to carry out technological design using
CAD, providing effective design developments that meet the requirements of
the future development of the industry;
- develop technological processes characterized by the absence of harmful
substances discharged into the environment, improvement of the air and water
purification system from harmful impurities, the use of automatic monitoring
of environmental conditions;
- develop measures to prevent the occurrence of defects and defective
products;
- develop monthly production programs and replacements
daily routine tasks for production sites and analyze them performance.

own:
- management methods of existing technological processes
the production of bread, pastry and pasta, ensuring the production of products
that meet the requirements of standards;
- statistical methods for processing experimental data
for the analysis of technological processes in the production of bread, pastry
and pasta;
- progressive methods of operating technological equipment for the storage of
raw materials, the production of bread, confectionery and pasta;
- economic-mathematical methods and computers when performing economic
calculations in the management process;

have experience:
- carrying out standard tests to determine the physico-chemical indicators of
the properties of raw materials, bread, confectionery and pasta and products;
- assess the operational capabilities of the process equipment;
- implementation of technical control, development of technological
documentation for compliance with technological discipline in the current
production.
- organization of production and effective work of the staff based on modern
management methods.

6. Course
author

7. Basic
literature
   -414c.
2. Puchkova L.I. Polandova RD, Matveeva I.V. Technology of bread,
   -559c.
3. Puchkova L.I. Laboratory workshop on the technology of bakery
   -SPb .: GIORD, 2004.-264s
4. Kalachev M.V. Small businesses for the production of bakery and pasta. -M
5. Kazennova N.K. Schneider DV, Tsyganova TB Formation of the quality of
   pasta. - M .: DeLi print, 2009. - 100s.
7. Medvedev G.M. Technology of macaroni production. Bread technology
   confectionery and pasta: Uch. For universities: 3h; H 111 -SPb .: GIORD,

8. The content of the discipline. Technologies of bread, flour confectionery and pasta: theoretical
knowledge in the field of technology of baking, confectionery and pasta production; analysis of modern technologies and evaluation of their effectiveness; chemical composition, organoleptic and physico-chemical properties of raw materials and its baking quality; modern methods of finished product quality; ways to improve the quality and nutritional value of products; range of bread and pasta, their nutritional value; technological processes of obtaining bakery and pasta products; features of the technological process of cooking various types of confectionery; interchangeability of different types of raw materials and replacement rules; accounting and analysis of the consumption of raw materials and packaging materials.

1. Basic information about the discipline:

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<tr>
<th>Name of the discipline</th>
<th>Technology of meat and meat products</th>
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<tr>
<td>2. Number of credits</td>
<td>10</td>
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<tr>
<td>3. Prerequisites:</td>
<td>Chemistry, Microbiology, Food Chemistry and Biochemistry, Food Production Equipment, Theoretical Foundations of Food Technology, Physical Methods of Processing Meat and Dairy Products.</td>
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<tr>
<td>4. Post requisites:</td>
<td>Designing food production enterprises, Diploma project (work).</td>
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<tr>
<td>5. Competences:</td>
<td>Know: - methods for analyzing the properties, composition and nutritional value of meat and meat products; - methods of theoretical and experimental research in the field of production technology and processing of meat and meat products using computer technology; - optimal and rational technological modes of operation of the equipment; - Methods for analyzing the processes of storage of raw materials, production and processing in order to ascertain promising technological solutions during the construction, reconstruction or technical re-equipment of industry enterprises; be able to: - to improve and optimize the existing technological processes on the basis of a systematic approach to the analysis of the quality of raw materials, technological process and requirements for the final product; - carry out analysis of technological processes based on the use of a data bank of the development trends of these processes; - to carry out technological design using CAD, ensuring the receipt of effective design developments that meet the requirements of the future development of the industry; - to develop technological and technical tasks for new construction, expansion, reconstruction and technical re-equipment of the enterprise with the receipt of a given range of products, justification of the technological scheme of production, traffic, space-planning decisions, evaluation of technical solutions in terms of technical and economic indicators, the level of unification and standardization, the level of mechanization and automation of production and labor protection; - develop monthly production programs and shift-daily plan tasks for production sites and analyze their implementation; own: - methods for the implementation of technical and microbiological quality control of raw materials and finished products; - management methods of existing technological processes of meat processing, ensuring the production of products that meet the requirements of standards;</td>
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</table>
- statistical processing of experimental data for the analysis of technological processes in the production of various types of meat and meat products;
- economic-mathematical methods and computers when performing economic calculations in the management process;

have experience:
- organization of production and effective work of the staff based on modern management methods;
- implementation of technical control, development of technological documentation for compliance with technological discipline in the current production conditions and understanding; demonstrate knowledge of technological methods of processing raw meat and semi-finished products; the main characteristics of raw materials and finished products; methods of cooling and freezing meat products;
- apply the acquired knowledge of acceptance and sampling methods to control the quality of meat products.

### 6. Course author

### 7. Basic literature

### 8. Content of the discipline. Improvement of knowledge and professional competence of future specialists, as well as expanding the horizons about the technology of meat and meat products, technology of production of semi-finished products, management of existing technological processes, development of techniques of economic calculations in the design of enterprises.

### 1. Basic information about the discipline:

<table>
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<tr>
<th>Name of the discipline</th>
<th>Technology of flour, cereals and animal feed</th>
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<tbody>
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<td>2. Number of credits</td>
<td>10</td>
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</table>

| 3. Prerequisites:       | Equipment for deep processing of raw materials and biofuel production, Grain science and theoretical foundations of processing industries, Fundamentals of technologies for the deep processing of raw materials and biofuels production, Elevator-storage facilities and storage of plant products, |
| 4. Post requisites:     | Techno-chemical control of grain processing enterprises, Designing enterprises for the processing of vegetable raw materials and biofuel production, Diploma project (work). |
| 5. Competences:         | As a result of studying this course, students should: Know: the types and characteristics of raw materials for the production of flour, cereals and animal feed; features of the compilation of grinding batches of grain in the production of flour and cereals; principles of construction of |
technological schemes of preparing raw materials for the production of flour, cereals and animal feed; principles of construction of grinding mills and peeling plants for groats mills; rules for receiving, processing and storage of raw materials feed mills; principles of construction of feed lines production lines; the quality characteristics of the finished products of the milling, cereals and feed mills. Be able to: the ability to use in the practice of the basic technological properties of grain of various crops in the production of flour, cereals and all types of raw materials in the production of animal feed: Consider the following properties of grain: moisture, nature, glassiness, quantity and quality of gluten, the content of various impurities, structural and mechanical properties, flour milling and baking properties, etc. Be able to set the GTO modes of grain, grinding modes and proizivanie grinding products, modes of dry and wet grain processing, peeling modes, f'curing, steaming, etc.

Have skills: the acquisition of practical skills in the production of various types of animal feed; acquiring practical skills in the processing of grain into cereals; the acquisition of practical skills in the processing of grain into flour. The ability to compare, formulate conclusions, build their own arguments, to express their position on the management of technological processes of production of animal feed, flour and cereals.

6. Course author
-Ermekbayev Seitkamal Baimuratovich

7. Basic literature
1. Ermekbayev S.B. Ән жарне зharma teklarasy boyynsha zerkhanalyк practicum - KazATU, Astana, 2015.- 277 beta
3. Ermekbayev S.B. Zharma өндірісінің tekhnolasy (Oқu rali) - Astana: S.Seifullin Atyndagy KATU, 2016.-105 beta
4. Shkaluly Қ., Yermekbayev S.B. Бірұтас, шахын астык өңдеу рымдары (оқу құрау) - Astana: S.Seifullin otyndahy ATU, 2016.-259 beta
5. Ermekbayev, S. B., Kakimov, M.M. Maily daқыldardi өңдеу зәне сактау technologsy (Oқu rali) - Astana: S.Seifullin ATyndagy KATU, 2017.– 113 beta

8. The content of the discipline. The purpose of teaching the discipline "Technology of flour, cereals and animal feed" provides students with the acquisition of theoretical knowledge and practical skills on the technology of processing of grain into flour, cereals and animal feed. When studying the discipline, special attention should be paid to the principles and methods of flour technology, cereals and mixed feeds, theoretical positions on which the engineering variants of technological operations of cleaning processes, preparation and grinding of grain and flaking of cereal crops are based, which can be used in their subsequent work. Modes of cleaning and preparation of grain for processing. The requirements of milling and cereal plants to raw materials. Rules for the organization and conduct of technological processes in mills, cereals and feed mills. To study traditional and non-traditional types of raw materials for the production of animal feed, the rules for their reception, placement and storage. Technological lines of feed mills. Classic and other schemes for the production of animal feed

1. Basic information about the discipline:
Name of the | Technology products catering
<table>
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<th>6. Course author</th>
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</table>
5. Ivanov L.I. "Spices, Spices, Condiments" - Smolensk: Rusich, 2000  

1. Basic information about the discipline:

<table>
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<tr>
<th>Name of the discipline</th>
<th>Technology of vegetable oils</th>
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2. Number of credits

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3. Prerequisites:

| Equipment for deep processing of raw materials and biofuel production, Processes and equipment of processing industries, Grain science and theoretical foundations of processing industries, Fundamentals of technologies for deep processing of raw materials and biofuel production |

4. Post requisites:

| Techno-chemical control of grain processing enterprises, Design of enterprises for the processing of vegetable raw materials and biofuel production, technology of flour, cereals and animal feed |

5. Competences:

| Features of oilseeds and oilseed raw materials as a storage and processing facility; - the main modes of storage of oilseeds and oilseed raw materials and factors affecting their efficiency; - the main factors affecting the quality of oilseed and oilseed raw materials during storage, the main ways to reduce losses and improve the quality of crop production in agriculture: Choose the most rational storage regimes for oilseeds and oilseeds, taking into account its quality and purpose; - determine the possible purpose of oilseed and oilseed raw materials for the most rational use and sale; to conduct quantitative and qualitative accounting of oilseeds and oilseeds in storage; - make a plan for product placement during storage; - to evaluate the effectiveness of the technology of post-harvest processing and storage of oilseeds and oilseeds raw materials, to determine the unit costs for the processing and storage of products; - assess the effectiveness of the main process equipment; Special merchandising, technical and technological terminology in the production of vegetable oil; - the main methods of evaluating the effectiveness of the main process equipment, - modern methods for assessing the quality of oilseeds and oilseeds and vegetable oil |

6. Course author

| - |
7. **Basic literature**


8. **The content of the discipline** is the formation of ideas, knowledge, skills in the field of production of vegetable oil from crop production (oilseeds) for the most rational use of grown products, taking into account its quality, reducing product losses during storage and processing (production of vegetable oil), increasing the efficiency of storage and processing, expanding the range of products.