

Ministry of agriculture of the Republic of Kazakhstan
Kazakh agro technical university named after S.Seyfullin

Considered at the meeting of
the Academic Council of
the university
Protocol №15 from 30.05.2019.

APPROVED
The chairman of the Board of
“Kazakh Agro Technical University
named after S.Seyfullin”
_____ A.K.Kurishbayev
« _____ » _____ 2019.

EDUCATIONAL PROGRAM
«Mechanical engineering»

Code and classification of the field of education:

6B07 Engineering, manufacturing and construction industries

Code and classification of training areas:

6B071 Engineering and engineering work

Code in the International Standard Classification of Education:

0710

Qualification: **bachelor of technical sciences in the educational program**
"Mechanical engineering"

Duration of study: 4 years

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Educational program «Mechanical engineering»

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1 Passport of the educational program

1.1 The aim of the educational program: providing industries with qualified personnel that meet the modern needs of society, science and technology in the field of mechanical engineering;

Objectives of the educational program:

- integration into the international educational space through the harmonization of educational programs of higher technical education with the educational programs of leading foreign technical universities;

- providing social and humanitarian education on the basis of knowledge of the laws of the socio-economic development of society, the modern history of Kazakhstan, information and communication technologies, the state language, foreign and Russian languages, as a means of interethnic communication.

- providing basic knowledge of the natural sciences and physical and mathematical disciplines on which the theory and technology of metallurgical processes for the production of ferrous and non-ferrous metals and alloys are based;

- development of professional knowledge in the field of computer-aided design of machines and technological processes in mechanical engineering;

- familiarization with the technologies and equipment of enterprises in the period of various types of practices;

- acquisition of skills and abilities of laboratory research, technological calculations, equipment selection and design using modern computer technologies and programs.

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

Relevance of EP. The President's Address to the People of Kazakhstan "New Development Opportunities in the Conditions of the Fourth Industrial Revolution" states that industrialization should become more innovative, using all the advantages of the new technological order 4.0.

For further development of the industry, taking into account the instructions of the President, the Union of Mechanical Engineers of Kazakhstan has developed a draft Comprehensive Plan for the Development of Mechanical Engineering of Kazakhstan for 2019-2030. Within the framework of this plan, in order to ensure the competitiveness of the domestic industry, a high-quality system of personnel training and retraining is necessary.

The study program was developed jointly with professors of the University of California, Davis (USA) and, taking into account the recommendations of leading experts in the field of industrial engineering, in accordance with the NRC and professional standards, agreed with the Dublin descriptors and the European Qualifications Framework, based on the SES approved RK dated October 31, 2018 (No. 604).

Competitive advantages of OP. A professional infrastructure (educational resources) was created on the basis of KATU, which is necessary for the implementation of EP:

- on the recommendation of leading scientists of the University of California at Davis (USA), the Agroengineering Platform was created, which includes the "Production and Experimental Metalworking and Welding Shop" and the "Design Bureau";

- Kazakhstan-Belarus Training and Production Center;
- Pavilion Kazakh-Chinese Center for Agricultural Mechanization;
- Laboratory "Robotics, Mechatronics and 3D Printing";
- Laboratory of Materials Science and TCM;
- Laboratory "Installation and operation of technological machines";
- Training workshops.

The presence of a modern material and technical base and a qualified faculty allows not only to gain good knowledge, but also to engage in scientific research for the purpose of intellectual growth and further admission to the master's and doctoral studies at the department.

Students of this SP can simultaneously undergo military training at the military department of the university, which is an attractive proposition especially for the male half. Students acquire military occupational specialty in three areas: VUS-261001 "Application of automobile units of units and formations of general arms", VUS-021000 "Combat use of general units, units and connections", VUS-590200 "Topographic works".

The uniqueness of the EP: is determined by the competencies that a bachelor will have if he has completed an education in this program:

- implementation on the basis of mutually beneficial strategic partnership with employers and all interested parties of an agreed spectrum of levels and forms of continuing professional education, providing for each student the possibility of forming an individual educational trajectory taking into account further professional, career and personal growth.

- improving the efficiency and effectiveness of research, fuller use of the scientific potential of the university to improve the quality of training, implementation of the principle of training through research at all stages of training;

- training of personnel with the necessary competencies and innovative thinking.

- introduction of new educational technologies and principles of organization of the educational process, ensuring the effective implementation of innovative models of continuous education and problem-oriented learning, including the use of modern information and communication technologies.

- monitoring of employment and career growth of graduates.

The main stakeholders of the OP are:

1. PTS, students, parents, persons equal to them and relatives of students;
2. Department of Technical and Innovative Development MIID RK;
3. Ministry of Agriculture of the Republic of Kazakhstan;

4. The Committee for Mechanical Engineering and Metalworking NPP RK "Atameken";

5. Machine-building enterprises of any profile;

6. Design organizations of machine building direction.

Graduates of the EP can perform the duties of a designer, technologist, mechanic, production manager, etc. in mechanical and mechanical repair enterprises. Also, graduates of EP in professional activities will be ready to solve various problems: technical and detailed design of units and parts of machines, typical technological processes of their manufacture; testing of machines and their elements for reliability; technical design of various automatic control systems based on standard solutions, testing of automation equipment; analysis of the reliability and durability of the designed machines; production management at the level of production sites, technological support of existing production, etc.

Graduates of EP have the opportunity to continue their studies in the magistracy in the educational program 7M071 - "Mechanical Engineering".

3 Competency model (portrait) of the graduate

3.1 Professional activities:

- technological machines and equipment; power equipment; running equipment; work equipment; drive systems;
- motion control systems; operator life support systems; general housing to accommodate all parts of the machine;
- construction and maintenance materials;
- equipment for the manufacture, testing and disposal of technological machines;
- equipment for maintenance and repair of technological machines;
- instrumentation for the manufacture and operation of machines;
- equipment for automation of working processes of machines;
- equipment for the design of machines.

3.2 Types of professional activity:

- agro-industrial complexes;
- research and production associations, scientific design and design organizations;
- repair, engineering plants, agricultural repair enterprises.

3.3 General educational competencies

Possession of basic knowledge in the field of natural science (social, humanitarian, economic) disciplines that contribute to the formation of a highly educated personality with a broad outlook and culture of thinking;

- skills in handling modern technology, the ability to use information technology in the field of professional activity;
- possession of the skills of acquiring new knowledge necessary for daily professional activities and continuing education in the master's program;

- knowledge of one of the foreign languages at a level not lower than the spoken;

Possession of basic knowledge in the field of general theoretical disciplines that contribute to the formation of the foundations of the scientific worldview, the development of logical thinking, the ability to analyze physical processes, abilities and readiness to participate in the development of modern theoretical and experimental research methods.

3.4 Base competencies

- readiness to use fundamental general engineering knowledge;
- readiness to critically comprehend the accumulated experience, change, if necessary, the profile of their professional activities;
- readiness to combine theory and practice to solve engineering problems;
- the ability to apply in practice the principles of rational use of natural resources and environmental protection;
- ability to use regulatory legal documents in their professional activities;
- willingness to choose measuring instruments in accordance with the required accuracy and operating conditions;
- ability to follow metrological norms and rules, comply with the requirements of national and international professional standards.
- the ability to use the basic laws of natural sciences in their professional activities, apply the methods of mathematical analysis and modeling, theoretical and experimental research;
- the ability to apply ways of rational use of raw materials, energy and other types of resources in mechanical engineering.

3.5 Professional competencies

- have an idea of the modern production technology of parts, components and assemblies;
- able to check the technical condition and residual resource of technological equipment, organize preventive inspection and maintenance of equipment;
- is able to take part in the work on the calculation and design of parts and components of machine-building structures in accordance with the technical specifications and the use of standard design automation tools.
- ability to systematically study scientific and technical information, domestic and foreign experience on the relevant training profile;
- ability to provide modeling of technical objects and technological processes using standard packages and computer-aided design tools, to conduct experiments according to specified methods with processing and analysis of results;
- the ability to participate in the preparation of scientific reports on the assignment and in the implementation of research and development results in the field of engineering.

4 Base of professional practice (educational, industrial, pre-diploma)

The educational program "Mechanical Engineering" includes the following types of practices: educational, industrial, undergraduate.

A group of enterprises and private firms. It also extends to agricultural production enterprises, agricultural repair enterprises, etc.

The bases of production practices are: Gomselmash OJSC (Gomel, Belarus), Minsk Tractor Works OJSC (Minsk, Belarus), KazNIIIMESH LLP (Almaty), Eurasia Group Kazakhstan LLP (Eurasia). Astana), “Spare Railway” LLP (Astana); Kazakhstan Agro Innovation Corporation LLP (Kokshetau), Schuchinsky Boiler Mechanical Plant LLP (Schuchinsk), KAMAZ Engineering JSC (Kokshetau), Lokomotiv Krasstyru Zauyty JSC (Astana), Astana Technological Center LLP (Astana), Ust-Kamenogorsk Condenser Plant LLP (Ust- Kamenogorsk), Lenger Machine-Building Plant LLP (Lenger), Ekibastuz Cooking Plant LLP (Ekibastuz),

5 The structure of the educational program

№	The name of the cycles and disciplines	Total complexity	
		In academic hours	In academic credits
1	2	3	4
1	The cycle of general education (ООД)	1680	56
1)	Compulsory components	1530	51
	Modern History of Kazakhstan	150	5
	Philosophy	150	5
	Foreign language	300	10
	Kazakh (Russian) language	300	10
	Information and communication technology (in English)	150	5
	The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	240	8
	Physical education	240	8
2)	University Component (Basics of Economics and Law)	150	5
	Component of choice	-	-
2	Cycle of basic disciplines (БД)	3360	112
1)	University component	1680	56
	Mathematics	270	9
	Physics	210	7
	Descriptive Geometry and Engineering Graphics	180	6
	Engineering Mechanics (Static, Dynamics)	120	4
	Material mechanics	120	4
	Automation of drawings	120	4
	Automated design of mechanisms	150	5
	Fundamentals of design	150	5
	CNC system (Fundamentals of Mechatronics)	150	5
	Materials in engineering design	150	5
	Educational practice	60	2
2)	Component of choice	1680	56
	Physical and colloidal chemistry	120	4
	Basics of technology of processing industries	120	4
	Electrical engineering and electronics basics	150	5
	Automated electric drive	150	5
	Process automation and control systems	270	9
	Thermal and refrigeration equipment for	150	5

	food production		
	Lifting and transport installations of food production	150	5
	Machines and apparatus for processing animal products	150	5
	Designing of the enterprises of technical service	150	5
	Machines and equipment for processing of crop products.	150	5
	Fundamentals of patenting and professional creativity	120	4
3	Cycle of major disciplines (И/Д)	1800	60
1)	University component	1800	60
	Heat engineering and thermodynamics basics	120	4
	Industrial Controllers	150	5
	Pneumatic and hydraulic drives	180	6
	Manufacturing processes (TMC+KTOII)	150	5
	Measuring systems (B3CTИ)	150	5
	Failure Analysis and Machine Repair	150	5
	Installation, testing and operation of technological machines	150	5
	Engineering economics	120	4
	Occupational Safety and Health	120	4
	Internship	510	17
2)	Component of choice	-	-
		-	-
4	Additional types of study (ДВО)	-	-
1)	Component of choice (<i>military training and other types of learning activities determined by the student independently</i>)	-	-
5	Final attestation	360	12
1)	Writing and submitting a thesis (project) or preparing and passing a comprehensive exam	360	12
	Total	7200	240

50	Проф	ПД	ВК		Преддипломная практика	2		60			60												2				
52					Написание и защита дипломной работы (проекта)	12		360			240												12				
					Итого									18	21	21	20	20	20	20	20	20	20				
					Общеобразовательные дисциплины (ООД)	56		1680	130	30	560	0	192	768	0	9	21	12	2	6	1	0	5	0	0	0	0
					Обязательный компонент (ООД/ОК)	51		1530	110	30	530	0	172	688	0	9	21	12	2	6	1	0	0	0	0	0	0
					Компонент по выбору (ООД/ВК)	5		150	20	0	30	0	20	80	0	0	0	0	0	0	0	0	5	0	0	0	0
					Базовые дисциплины (БД)	112		3360	390	310	460	0	440	1760	0	9	0	9	18	14	14	20	10	5	0	10	3
					Компонент по выбору (БД/КВ)	57		1710	230	150	190	0	228	912	0	0	0	4	8	5	6	11	5	5	0	10	3
					Вузовский компонент (БД/ВК)	55		1650	160	160	270	0	212	848	0	9	0	5	10	9	8	9	5	0	0	0	0
					Профилирующие дисциплины (ПД)	60		1800	160	60	760	0	164	656	0	0	0	0	0	0	5	0	5	15	20	10	5
					Компонент по выбору (ПД/КВ)	0																					
					Вузовский компонент (ПД/ВК)	60		1800	160	60	760	0	164	656	0	0	0	0	0	0	5	0	5	15	20	10	5
					Итого по учебному плану	240		7200	680	400	2020	0	796	3184	0	18	21	21	20	20	20	20	20	20	20	20	20

Appendix 3 Description of the disciplines of compulsory and university components

1. Basic information about the discipline:

1. Basic information about the discipline:	
Name of the discipline	Modern history of Kazakhstan (ГЭ)
2. Number of credits	5
3. Prerequisites:	School basic knowledge
4. Postrequisites:	cultural studies, political science, philosophy, sociology
5. Competencies:	Demonstrate knowledge of the main periods of the formation of an independent Kazakhstan statehood; to relate the phenomena and events of the historical past with the general paradigm of the world-historical development of human society through critical analysis; master the techniques of historical description and analysis of the causes and consequences of the events of modern history of Kazakhstan; to propose a possible solution to contemporary problems based on an analysis of the historical past and reasoned information; analyze the security and importance of the modern Kazakh model of development; identify the practical potential of intercultural dialogue and respect for spiritual heritage; to substantiate the fundamental role of historical knowledge in the formation of Kazakhstan's identity and patriotism; form their own citizenship on the priorities of mutual understanding, tolerance and democratic values of modern society.
6. Author of course	Department of History of Kazakhstan
7. General literature	1. Современная история Казахстана . Учебник для студентов неисторических спец. (бакалавриата) высш. учеб. заведений / Б. Г. Аяган [и др.]. ; ред. Б. Г. Аяган ; Ин-т истории гос-ва М-ва образования и науки РК. – Алматы: Раритет, 2010, 2. Аминов Т.М. Современная история Казахстана. Учебное пособие. Алматы., 2017 г.

	<p>3. Назарбаев Н.А. Эра независимости.- Алматы: ҚАЗАқпарат, 2017.</p> <p>4. Нуртазина Р.А. Национальная безопасность Республики Казахстан: учеб.пособие.- Алматы: Бастау, 2014</p> <p>5. Ертлесова Ж. Реформы 90-х: интервью с ключевыми участниками событий. - Алматы, Атамұра. - 2016.</p>
8. Content of the discipline	<p>Introduction to the discipline; Kazakhstan on the way to Independence; stages of formation of the national state; Civil and political confrontation; Implementation of the Soviet model of state construction; Contradictions and consequences of Soviet reforms in Kazakhstan in the second half of the twentieth century; The policy of "perestroika" in Kazakhstan; Kazakhstan model of economic development; Social modernization is the basis of the well-being of society; Ethno-demographic processes and the strengthening of interethnic harmony; Socio-political development prospects and spiritual modernization; The policy of forming a new historical consciousness of the people of the Great Steppe; Kazakhstan is a state recognized by the modern world; N.A.Nazarbayev - a person in history; Formation of a united nation of the future.</p>
Name of the discipline	Philosophy
2. Number of credits	5
3. Prerequisites:	Sociology, political science, cultural studies, psychology, modern history of Kazakhstan.
4. Postrequisites:	History and philosophy of science, philosophy of modern society.
5. Competencies:	Formation of openness of consciousness, understanding of our own national code and national identity, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education.
6. Author of course	Department of Philosophy
7. General literature	<p>1. Петрова В.Ф., Хасанов М.Ш. «Философия». – Алматы: Эверо, 2014.</p> <p>2. Бертран Р. «История западной философии» – М.: Издатель Litres, 2018. – 1195 с.</p>

	3. Kenny A.«New History of Western Philosophy». Volume 1-4. – Oxford University Press, 2006 - 2010. (КЭННИ Эй. «Нью хистори оф Вестерн философи». Волум 1-4 – Оксфорд юниверсити пресс, 2006-2010)
8. Content of the discipline	The emergence and development of philosophy. Basics of philosophical understanding of the world. Consciousness, soul and language. Being. Ontology and metaphysics. Human philosophy and value world. “Magilik Yel” and “Ruhani Zagyrу” are the philosophy of the new Kazakhstan.
Name of the discipline	Foreign language
2. Number of credits	10
3. Prerequisites:	Foreign language school course
4. Postrequisites:	Professionally-oriented foreign language
5. Competencies:	According to the results of mastering the program, the student, depending on the level of training, at the time of completion of the course, the student reaches the level B1- (IELTS 4.0-5.0) or B2- (IELTS5.5-6.0)
6. Author of course	Department of Foreign Language
7. General literature	1. Julie Lachance ((July 21, 2015). Practice Makes Perfect Premium: Basic English. McGraw-Hill Education; 2 edition 2. Chris Lele. (March 20, 2018) The Vocabulary Builder Workbook: Simple Lessons and Activities to Teach Yourself. Zephyros Press; Workbook edition 3. Deborah Capras (01 Jan 2015). Small Talk : B1+. HarperCollins Publishers 4. Mark Hancock (27 Apr 2017). English Pronunciation in Use Intermediate Book with Answers and Downloadable Audio. CAMBRIDGE UNIVERSITY PRESS 5. Katie Foufouti (28 Dec 2017). Oxford Skills World: Level 4: Reading with Writing Student Book / Workbook. Oxford University Press

	<p>6. Herbert Puchta, Jeff Stranks, Peter Lewis-Jones (31 Oct 2015). Think (SB+audio, WB+audio, TB, Tests – levels 1, 2, 3, 4). CAMBRIDGE UNIVERSITY PRESS</p> <p>7. British National Corpus: http://www.natcorp.ox.ac.uk</p> <p>8. The Corpus of Contemporary American English (COCA): http://www.americancorpus.</p>
8. Content of the discipline	<p>The course program is designed for the volume of teaching - 300 hours, of which: 90 hours - for auditory work and 180 hours - for independent work. The course ends with a comprehensive exam. The course is designed for 2 semesters.</p>
Name of the discipline	Kazakh (Russian) language
2. Number of credits	10
3. Prerequisites:	School course of Russian language and literature
4. Postrequisites:	Professional Russian
5. Competencies:	<p>Possess basic communication skills in Kazakh / Russian: understand, express, interpret concepts, thoughts, feelings, facts and opinions both verbally 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.</p>
6. Author of course	Department of Kazakh and Russian languages
7. General literature	<p>1. Русский язык: учебное пособие для студентов казахских отделений университетов (бакалавриат) / под ред. К.К. Ахмедьярова, К.К. Жаркынбековой. – Алматы: Қазақ университеті, 2008.</p> <p>2. Мухамадиев Х.С. Пособие по научному стилю речи. Русский язык. – Алматы: Казак университеты, 2009.</p> <p>3. Федосюк М.Ю., Ладыженская Т.А., Михайлова О.А., Николина Н.А. Русский язык для студентов-нефилологов: учебное пособие. – М., 2000. – 256 с.</p>

8. Content of the discipline	<p>Language and its main functions. Speech: types and forms of speech.</p> <p>Functional-semantic types of speech. Functional speech styles. General characteristics of functional speech styles.</p> <p>The general concept of the scientific style of speech. Features of scientific style at the lexical, morphological, syntactic level. Text as the leading unit of verbal communication. Structural and semantic articulation of the text.</p> <p>Theme text. The structure and meaning of the text. Communicative tasks of the text. The role of sentences in the text. Text-forming sentence functions. Microtheme of the text. Progression of the text as an increase in its volume and amount of information. Compression as the main type of processing scientific text. The plan and its preparation in the scientific field. Types of plans. Teasing a scientific text. Compositional-semantic structure of the scientific text .. The outlining of the scientific text. Annotation of scientific texts. Types of annotations. The referencing of scientific texts. Types of abstracts. Review of scientific text. The structure of the scientific review. Feedback on the scientific work. Summary-conclusions. Oral culture (general concept). The norms of the culture of speech (Orphage, lexical, morphological, syntactic norms). Culture of speech behavior in the professional field. The quality of good (exemplary) speech. Improving the ethics of speech behavior (speech etiquette, business etiquette). Types of business communication (business conversation, telephone conversations)</p>
Name of the discipline	Information and communication technology (in English)
2. Number of credits	5
3. Prerequisites:	Math, physics
4. Postrequisites:	Computer graphics, operating systems, computer networks, database theory.
5. Competencies:	<p>As a result of studying this discipline, students will be able to:</p> <ul style="list-style-type: none"> - design and create simple websites; - to process vector and raster images; - create multimedia presentations;

	<ul style="list-style-type: none"> - use different social platforms for communication; - use various forms of e-learning to expand professional knowledge; - use various cloud services.
6. Author of course	Department of Information and Communication Technologies
7. General literature	<p>1. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashev B.A. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p., ISBN 978-601-7911-03-4 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)</p> <p>2. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashev B.A. Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed. - Almaty: IITU, 2017. - 588 p., ISBN 978-601-7911-04-1 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)</p> <p>3. Urmashev B.A. Information and communication technology: Textbook / B.A. Urmashev. – Almaty, 2016. - 410 p., ISBN 978-601-7940-02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)</p> <p>4. Нурпеисова Т.Б., Кайдаш И.Н. ИКТ. Учебное пособие / Алматы, изд-во Бастау, 2017, 183 с.</p> <p>5. Nurpeisova T.B., Kaidash I.N. ICT, Almaty, Bastau, 2017. 241 p.</p>
8. Content of the discipline	<p>The role of ICT in key sectors of social development. ICT standards. Introduction to computer systems. Computer systems architecture. Software. Operating Systems. Human-computer interaction. Database systems. Data analysis. Data management. Networks and telecommunications. Cybersecurity Internet technologies. Cloud and mobile technologies. Multimedia technology. Smart technology. E-technology. E-business. E-learning. E-government. Information technology in the professional field. Industrial ICT. ICT development prospects.</p>
Name of the discipline	Political Science and Sociology

2. Number of credits	4
3. Prerequisites:	Basic school knowledge
4. Postrequisites:	Philosophy, history and philosophy of science
5. Competencies:	Formation of the ability of a critical understanding of the system of interpersonal relations in society, awareness of the nature of society, the system of its groups and 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.
6. Author of course	Department of Philosophy
7. General literature	<p>1. Назарбаев Н.А. «Взгляд в будущее: модернизация общественного сознания».-Астана, 2017</p> <p>2. Биекенов К.У., Биекенова С.К., Кенжакимова Г.А. «Социология: Уч.пособие». – Алматы: Эверо,2016. – 584с.</p> <p>3. «Социология. Основы общей теории: учебник» / Под ред. Г.В. Осипов, Л.Н. Москвичев. - 2-е изд., испр. и доп. - М.: Норма, 2015. - 912 с.</p> <p>4. Macionis J. Society: The Basics. Pearson, 2016. (Масионис Джей. Соушети: Зе Байзикс. Пэрсон, 2016.)</p> <p>5. Heywood A. Politics. - N.-Y.: Palgrave Macmillan, 2013. (Хэйуд Эй. Политикс. – Эн. – Уай.: Палграив Макмилан, 2013)</p>
8. Content of the discipline	Sociology in understanding the social world. Introduction to the theory of sociology. Sociological research. Social structure and stratification of society. Socialization and identity. Social change: the latest sociological debate. Political science as a science and academic discipline. The main stages of the formation and development of political science. Politics in the system of public life. Political power: the essence and mechanism of implementation. World politics and modern international relations.
Name of the	Culturology and psychology

discipline	
2. Number of credits	4
3. Prerequisites:	Basic school knowledge
4. Postrequisites:	Philosophy, history and philosophy of science
5. Competencies:	<p>Development of the social and humanitarian worldview as the basis for the modernization of public consciousness through the formation of cultural identity, the ability to analyze and evaluate 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.</p> <p>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 N.A. Nazarbayev.</p>
6. Author of course	Department of Philosophy
7. General literature	<p>1. Джакупов С.М. «Введение в общую психологию». – А.: Қазақ университеті, 2014</p> <p>2. Руденко А.М. «Психология в схемах и таблицах»: учебное пособие. –М: Феникс, 2016. –379 с.</p> <p>3. Нуржанов Б.Г., Ержанова А.М. «Культурология». -Алматы, 2011.</p> <p>4. Жолдубаева А.К. «Культурология: практикум». -Алматы: Казну им. аль-Фараби, 2014.</p>
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.

Name of the discipline	Physical education
2. Number of credits	8
3. Prerequisites:	biology, anatomy, human physiology, hygiene, medical control, valeology, pedagogy, psychology
4. Postrequisites:	The program of the course “Physical Education” develops skills and abilities in the field of students' physical culture, forms the need to maintain a healthy lifestyle, preserve and promote health, improves the level of physical fitness for the implementation of their abilities in the process of daily activities
5. Competencies:	Ensuring a sufficient level of physical readiness of future professionals, 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.
6. Author of course	Шкурков А.С., Сатбаев Е.К.
7. General literature	В.И. Ильинич. Физическая культура студента. Москва, 2001 г. Г.Д. Иванов, А.К.Кульназаров. Физическое воспитание студентов. Алматы, 2002 г. Теория и методика физического воспитания. Под общ. ред. А.П.Матвеева и Д.Новикова. М., 2005.
8. 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.
Name of the discipline	Basics of Economics and Law
2. Number of credits	5
3. Prerequisites:	Mathematics, Political Science and Sociology,
4. Postrequisites:	Production Management, Patent Law, Investment Management
5. Competencies:	<p>A. Knowledge of one's rights and responsibilities, ability to work in a team, ability to scientifically analyze socially significant problems and processes, ability to use the basic provisions and methods of the humanities, social and economic sciences in various types of professional and social activities.</p> <p>V. to be able to use regulatory legal documents in his activity; the ability to apply basic knowledge in the field of economics, economic studies and social management, to apply basic knowledge in the field of economics, economic studies and social management.</p> <p>C. Ability to make judgments, assess ideas, draw conclusions, build your own argumentation, the ability to express and justify your position in the field of economics and from the point of view.</p>
6. Author of course	-
7. General literature	<p>1. Марченко М.Н. Теория государства и права. – М.: 2010. 2013ж.</p> <p>2. Артемьев А.И., Дорошенко М.Е. Анализ неравновесных состояний и процессов в макроэкономических моделях / М.Е. Дорошенко. – М.: ТЕИС, 2000.</p> <p>3.Ефимова Е.Г. Экономическая теория в схемах, таблицах, графиках и формулах / Е.Г. Ефимова. – М.: Флинта, 2003.</p>
8. Content of the discipline:	The application of theoretical knowledge to enhance and deepen knowledge of economics and law; knowledge of basic legal concepts, the main branches of Kazakhstan law; be able to make recommendations to improve the current

economic and legal situation, must acquire the skills of economic and legal analysis for practical application.	
Name of the discipline	Mathematics
2. Number of credits	9
3. Prerequisites:	School Mathematics
4. Postrequisites:	Descriptive Geometry and Engineering Graphics, Computer Graphics, Design Basics, Descriptive Geometry and Engineering Graphics, Automated Mechanism Design, CAD Technological Machines and Equipment, Machine and Tractor Park Operation, Machines and Equipment for Processing Agricultural Products
5. Competencies:	<p>Know and understand:</p> <ul style="list-style-type: none"> - the basic concepts, definitions, formulas, theorems and methods for solving problems in sections of the program; - basics of discipline in the scope of the work program; - be able to apply this knowledge in practice; - apply the knowledge to solve applied problems; - master the methods of solving various types of problems, analyze theoretical data, use the knowledge gained in solving applied problems. <p>Formation of practical skills:</p> <ul style="list-style-type: none"> - design, create mathematical models and choose the most effective ways to solve problems. - master the skills of developing algorithms for solving applied problems. - develop logical and mathematical thinking for mathematical modeling in solving practical problems, use the achievements of fundamental science for the successful development of general theoretical and special disciplines in the specialty.
6. Author of course	-

7. General literature	<p>Высшая математика. Том 1. Гусак А.А. Минск. Тетро Системс, 2001 г.</p> <p>2. Высшая математика. Том 2. Гусак А.А. Минск. Тетро Системс, 2001 г.</p> <p>3. Н.С. Пискунов. Дифференциальное и интегральное исчисление. М. 1996. т. 1,2.</p> <p>4. В.П. Минорский. Сборник задач по высшей математике. М. Наука. 2006.</p> <p>5. В.С. Шипачев. Высшая математика, М 2005</p> <p>6. В.П. Минорский. Сборник задач по высшей математике. М. Наука. 2006.</p> <p>7. Основы математического анализа. Ильин В.А., Позняк Э.Г. Часть 1. М.Физматлит, 2005.</p> <p>8. Основы математического анализа. Ильин В.А., Позняк Э.Г. Часть 2. М.Физматлит, 2005</p> <p>9. Erwin Kreyszing, Herbert Kreyszing, Edward J. Norminton. Advanced Engineering Mathematics (International student version). Asia: John Wiley & sons, 2011, 128 p.</p>
<p>8. Content of the discipline: Fundamentals of mathematical analysis, the limit and continuity of the function, the foundations of differential and integral calculus. Fundamentals of linear algebra and analytic geometry. Determinants, matrices, systems of equations, equations of lines and surfaces. Vector algebra and vector analysis. Vectors, scalar, vector and mixed product of vectors. Invariance of the scalar product. Vectors in different coordinate systems. Problems leading to differential equations. Differential equations of the first order. Higher order differential equations. Equations that can be reduced in order. Application to solving physical problems.</p>	
Name of the discipline	Physics
2. Number of credits	7
3. Prerequisites:	School Physics
4. Postrequisites:	Electrical engineering and electronics fundamentals
5. Competencies:	A. The formation of an understanding of the occurring physical phenomena, the ability to use in practice the

	<p>scientific study of concepts about physical and mathematical processes in nature, about the methods and methods of their description, basic principles, laws and theories of classical and modern physics and mathematics.</p> <p>B. Obtaining practical skills of obtaining the necessary information, possession of techniques and methods for solving specific problems from various fields of physics and mathematics.</p> <p>C. The ability to allocate specific physical content in the applied tasks of the future specialty.</p>
6. Author of course	-
7. General literature	<p>Трофимова Т.И. Курс физики. – М.: 2011</p> <p>Детлаф А.А., Яворский Б.М. Курс физики. - М.: 2010.</p> <p>Р.И. Грабовский. Курс физики. – М.: ВШ., 1980, 2012.</p> <p>Мукашева А.К. и др. «Физика – 1» Учебно-методический комплекс для студентов инженерных специальностей. – Астана, 2009.</p>
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.
Name of the discipline	Descriptive Geometry and Engineering Graphics
2. Number of credits	6
3. Prerequisites:	School course subjects drawing, mathematics
4. Postrequisites:	Computer graphics, design fundamentals, computer-aided design of mechanisms, CAD technology machines and equipment, an EX-machine-tractor fleet, machinery and equipment for processing agricultural products
5. Competencies:	A. Ability to use the solution of various positional, metric and combined tasks in the complex drawing and in the

	<p>visual image.</p> <p>B. Acquisition of practical skills of work and reading, implementation of drawings in the specialty.</p> <p>C. In 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.</p>
6. Author of course	-
7. General literature	<p>Стандарты ЕСКД. Общие правила выполнения чертежей. 1984.</p> <p>Мусалимов Т.К. Начертательная геометрия - Астана, 2006 г.</p> <p>Мусалимов Т.К., Колбатыр С.А. Начертательная геометрия и техническое черчение. Астана: Фолиант, 2018.</p> <p>Левицкий В.С. Курс машиностроительного черчения. – М.,1987.</p> <p>Т.К.Мусалимов, С.Ә.Қолбатыр, Г.М.Алгартова. Сызба геометрия және инженерлік графика. Алматы: 2013.</p> <p>Т.Мусалимов, С.Қолбатыр. Сызба геометрия және техникалық сызу. Астана: Фолиант, 2017.</p> <p>Федоренко В.А., Шошин А.И. Справочник по машиностроительному черчению. – Л., 1983.</p> <p>Машиностроительное черчение. Под ред. Вяткина Г.П. –М., 1985.</p> <p>Михайленко В.Е., Понамарев А.М. «Инженерная графика» - К., 1985.</p>
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.	
Name of the discipline	Engineering Mechanics (Static, Dynamics)
2. Number of credits	4
3. Prerequisites:	Physics, math

4. Postrequisites:	Technological machines and equipment for processing industries
5. Competencies:	<p>A. To know the basic concepts and laws of mechanics in the form of axioms, theorems, principles arising from these laws, methods of studying equilibrium, skills necessary for further study of special engineering disciplines, as well as in his further professional activity directly in production.</p> <p>B. Ability to do in practice calculations for balance, determination of kinematic characteristics and dynamic analysis of mechanical systems.</p> <p>C. In the field of communication - the formation of the limits of admissibility of the adopted provisions on the balance and movement of mechanical systems.</p> <p>In the field of education - the ability to analyze the key problems of statics and kinetics of material objects.</p>
6. Author of course	-
7. General literature	<p>Никитин Н.Н. Курс теоретической механики. М.: ВШ, - 2011. – 607с.</p> <p>Тарг С.М. Краткий курс теоретической механики, М.: ВШ, 2011. – 416с.</p> <p>Сборник заданий для курсовых работ по теоретической механике, под ред. А.А. Яблонского, М., ВШ, - 1985. – 384с. и посл. издания.</p> <p>Мещерский И.В. Сборник задач по теоретической механике. М., Наука, - 2012. – 448с. и другие издания.</p> <p>Сборник коротких задач по теоретической механике. Под ред. О.Э.Кепе. СПб. Лань, 2009.</p> <p>Бутенин Н.В., Лунц Я.Л., Меркин Д.Р. Курс теоретической механики. Т1,2. М., Наука, - 2012.</p>
8. Content of the discipline	Systems of forces and equilibrium conditions with an emphasis on engineering problems. Kinematics and kinetics of material points, a system of material points and solids; Application of these topics to engineering problems.
Name of the discipline	Material mechanics
2. Number of credits	4

3. Prerequisites:	Mathematics, physics, fundamentals of agricultural machinery, engineering mechanics, Descriptive geometry and engineering graphics
4. Postrequisites:	Theory and calculation of agricultural machinery, CAD technological machines and equipment, Basics of design, Mechanization of animal husbandry.
5. Competencies:	<p>A. As a result of studying this discipline, students should know and be able to apply the basic methods and principles for calculating structural elements for strength, rigidity and stability.</p> <p>B. To be able to use reference materials on the mechanical characteristics of materials. Based on the results of calculations, be able to make recommendations on the rational design of engineering structures.</p> <p>C. To have the skills to work on the calculation of structural elements for strength and stiffness for the simplest types of deformations (tension-compression in statically definable systems, shear, bending, torsion) and for some complex types of deformations (bending with torsion, eccentric compression, oblique bending), as well as acquire practical skills in the calculation of structural elements for stability in buckling. Have the skills to clearly express thoughts and opinions both verbally and in writing about the basic assumptions, hypotheses in the calculations of the strength, rigidity and stability of structural elements.</p>
6. Author of course	-
7. General literature	<p>Степин, П. А. Сопротивление материалов.: 6- издание, перер. и допол. / П.А. Степин. - М.: Высшая школа, 1979, 1983, 2010 - 312 с., - 303 с. - 320 с. :</p> <p>Межецкий, Г. Д. Сопротивление материалов: учебник / Г. Д. Межецкий, Г. Г. Загребин, Н. Н. Решетник. - 3-е изд., перераб. и доп. - М.: Издательско-торговая корпорация "Дашков и Ко", 2013. - 432 с.</p> <p>Писаренко Г.С. Сопротивление материалов: 4-е издание, перер. и допол. / Агарёв В.А. Квитка А.Л. Попков В.Г. Уманский Э.С.; Ред.Писаренко Г.С. –М. : "Вища школа", 2006г. - 696 с.</p> <p>Аркуша, А. И. Техническая механика. Теоретическая механика и сопротивление материалов : учебник для сред.проф. учеб. заведений / А. И. Аркуша. - 6-е изд., стер. - М. : Высшая школа, 2005. - 352 с.</p> <p>Аубакиров, Б. У. Инженерная механика :учеб.пособие / Б.У. Аубакиров, А.С. Бектегенова; МСХ РК. -</p>

	<p>Астана :КазАТУим.С.Сейфуллина, 2016. - 163 с.</p> <p>Аубакиров, Б. У. Лабораторный практикум по дисциплине сопротивление материалов :практикум / Б. У. Аубакиров, Н. Б. Оразбеков ; МСХ РК. - Астана :КазАТУим.С.Сейфуллина, 2015. - 98 с.</p>
8. Content of the discipline	<p>Uniaxial load and deformation. General concepts of stress-strain states, strength conditions of materials. Shift. Torsion shafts. Bending beams. Bending deflections. Introduction to stiffness and stability. Experiments that illustrate the main hypotheses and verify the theoretical data used in the mechanics of materials using basic tools and methods for analyzing experimental stresses.</p>
Name of the discipline	Automation of drawings
2. Number of credits	4
3. Prerequisites:	School course informatics, Information and communication technology
4. Postrequisites:	Basics of Design, Descriptive Geometry and Engineering Graphics, Automated Mechanism Design, CAD of Technological Machines and Equipment.
5. Competencies:	<p>A. Know the elements of descriptive geometry and engineering graphics, the basics of automation theory, drawing execution, know the capabilities and applications of the КОМПАС -3D system, the theoretical foundations and applied value of computer graphics, ways of displaying spatial forms on a plane, the capabilities of computer drawing design.</p> <p>B. To be able to use knowledge and concepts of computer graphics, determine the geometric shape of parts by 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 for working with computer graphics application program - КОМПАС -3D.</p> <p>C. Possess the skills to solve practical problems of displaying graphical information (geometric modeling</p>

	problems) using specialized software tools, skills in using the KOMPAS -3D program for creating drawings, illustrations for course and degree design.
6. Author of course	-
7. General literature	<p>Большаков, В. П. Инженерная и компьютерная графика / В.П. Большаков, В.Т. Тозик, А.В. Чагина. - М.: БХВ-Петербург, 2013. - 288 с.</p> <p>Большаков, В.П. Инженерная и компьютерная графика / В.П. Большаков. - М.: БХВ-Петербург, 2004. - 132 с.</p> <p>Большаков, В.П. Инженерная и компьютерная графика. Практикум / В.П. Большаков. - М.: СПб: БХВ, 2004. - 592</p> <p>Инженерная 3D-компьютерная графика. Учебное пособие / А.Л. Хейфец и др. - М.: Юрайт, 2015. - 464 с.</p>
8. Content of the discipline	Application of theoretical knowledge for creating graphic images, displaying information, basics of working in modern graphic tools of interactive computer graphics (creating 2D images in Compass). To determine the geometric shape of parts from their images, the basis of solving the problems of geometric modeling of graphic information in interactive
Name of the discipline	Automated design of mechanisms
2. Number of credits	5
3. Prerequisites:	Mathematics, Physics, Descriptive Geometry and Engineering Graphics, Computer Graphics, Engineering Mechanics, Material Mechanics
4. Postrequisites:	Basics of designing, CAD of technological machines and equipment, Theory and calculation of agricultural machines.

5. Competencies:	<p>A. Know Know and understand the nature of the acting forces on the links of the mechanism and methods of their analysis, modes of movement of mechanisms and methods of their regulation.</p> <p>B. To be able to carry out a structural analysis of mechanisms and machines. The ability to automate the use of computer applications for the analysis of mechanisms.</p> <p>C. To possess the methods of kinematic and dynamic studies of mechanisms as well as theoretical and application of CAD. Providing the necessary skills and abilities for the subsequent study of special engineering disciplines, as well as in further professional activities directly in production conditions.</p>
6. Author of course	-
7. General literature	<p>Теория механизмов и машин, Артоболевский И. И., 1988 г.</p> <p>Теория механизмов и машин, Под ред. К.В. Фролова. М., 2004 г.</p> <p>Курсовое проектирование по теории механизмов и механике машин / С. А. Попов, Г. А. Тимофеев, 2008 г.</p> <p>Краткий курс теории механизмов, Нурғалиев Т.К., 2001 г.</p>
8. Content of the discipline	<p>The course "Automated Design of Mechanisms" presents the scientific basis for the construction of mechanisms, machines and devices, as well as the methods of their theoretical and experimental research. In the course of studying the course, course design is carried out on the theory of machines and mechanisms in order to obtain the necessary practical skills in applying the main provisions and conclusions of the theory to solving specific technical problems. The objective of the course is to provide knowledge about the structure of the main types of mechanisms, the kinematic and dynamic characteristics of mechanisms with rigid links, knowledge of the methods for determining the parameters of mechanisms according to the required conditions. The study of the discipline is accompanied by the use of computer application programs for the study of mechanisms.</p>
Name of the discipline	Design Basics
2. Number of credits	5

3. Prerequisites:	Mathematics, Descriptive Geometry and Engineering Graphics, Computer Graphics, Engineering Mechanics (Statics, Dynamics), Materials Mechanics
4. Postrequisites:	CAD of technological machines and equipment, livestock mechanization, Machines and equipment for processing agricultural products, Theory and calculation of agricultural machines.
5. Competencies:	<p>A. To be able to independently design the nodes of the machines of the desired destination for the given output data. Independently select reference literature, GOST, as well as graphic material (design prototypes) in the design. Take into account in the design requirements of manufacturability, efficiency, maintainability. Choose the most suitable materials for machine parts and use them rationally. Perform calculations of parts and assemblies of machines, using reference books and GOST. Prepare graphic and text design documentation in full compliance with ESKD requirements, select a design model and carry out the necessary calculations in the design process and evaluate the performance of typical engineering products, select the most suitable materials for machine parts, use the software package on the computer when calculating and designing machine parts . To have the skills to calculate and design typical parts of transmission mechanisms, connections, supporting and bearing elements of machines.</p> <p>B. To know the Main criteria for the performance of machine parts and the types of their failures, the theory and calculation of machine parts and components. Typical design of parts and components of machines, their properties and applications. Fundamentals of automation of calculations and design of parts and components of machines, elements of computer graphics and design optimization.</p> <p>C. To be able to independently design the nodes of the machines of the desired destination for a given output among them to choose the best option with a rationale. Choose the most suitable material for machine parts and use them rationally. To issue graphic and text design documentation.</p>
6. Author of course	
7. General literature	<p>Иванов М.Н. Детали машин. – М.: Высшая школа, 2014. -408с.</p> <p>Решетов Д.Н. Детали машин. – М., Машиностроение.1989.</p>

	<p>Детали машин: учебник/Н.В. Гулиа, В.Г. Клоков; под. общ. ред. –М: Академия 2014.-416 с</p> <p>Чернавский А.С. Курсовое проектирование деталей машин. М.: Машиностроение, 2005.</p> <p>Шейнблит А.Е. Курсовое проектирование деталей машин. М.: Высш.шк, 2002.</p>
8. Content of the discipline	<p>The concepts of the basic criteria for the performance of machine parts and the types of their destruction.</p> <p>Fundamentals of the theory and calculation of parts and catch machines. Typical design of parts and components of machines, their properties and applications. Fundamentals of automating the calculation and design of parts and components, the study of general principles of design and engineering, construction of models and algorithms for calculating typical engineering parts, taking into account the main criteria for efficiency and developing design skills and technical creativity. - about typical methods of calculation and design of parts and units of machines.</p> <p>know: - the main criteria for the performance of machine parts and the types of their failures; - The basics of the theory and methodology for calculating typical parts and assemblies of machines; - typical designs of parts and assemblies of machines, their properties and applications; - the basics of automation of calculations and design of parts and components of machines, elements of computer graphics and design optimization.</p>
Name of the discipline	CNC system
2. Number of credits	5
3. Prerequisites:	Industrial Microcontrollers
4. Postrequisites:	Metalworking machines and welding equipment
5. Competencies:	<p>A. Have a notion about the classification of numerical control systems.</p> <p>B. Know the general principles of the construction of CNC systems and the tasks of control systems.</p>
6. Author of course	Аджанов А.У
7. General literature	1. Сосонкин В.Л., Мартинов Г.М. Системы числового программного управления: Учеб. пособие. - М.:

	<p>Логос, 2005. - 296 с.</p> <p>2. Современные системы ЧПУ и их эксплуатация: учебник для нач. проф. Образования / М.А. Босинзон; под ред. Б.И. Черпакова. - 2-е изд., стер. М.: Издательский центр «Академия», 2008.- 192 с.</p>
8. Content of the discipline	<p>Classification of control systems. PCNC system architecture. The problem of real time control systems. Problems of electroautomatic control. Building intermodular communication environment. Principles of building remote CNC terminals. Features of CNC architecture with STEP-NC. Realization of a geometric problem. Implementing a logical control problem. Control of electroautomatic machine tools with CNC. The implementation of the terminal task. Implementation of the diagnostic management problem.</p>
Name of the discipline	<p>Materials in engineering design</p>
2. Number of credits	<p>5</p>
3. Prerequisites:	<p>Mathematics, physics, theoretical mechanics, computing and programming; engineering graphics.</p>
4. Postrequisites:	<p>Installation and operation of technological machines, Mechanical Engineering, Reliability of technological machines, Repair of technological machines. When performing a design diploma project, it is necessary to know from which materials it is necessary to manufacture the structures under development, taking into account their physical and mechanical properties.</p>
5. Competencies:	<p>- know how to use in practice the concepts of materials science and materials processing technology in mechanical engineering, to understand its place in the system of other disciplines on the organization and management of production processes.</p>
6. Author of course	<p>Grishin A.N.</p>
7. General literature	<p>1. А.А.Черепашков, Н.В. Носов. Компьютерные технологии, моделирование и автоматизированные системы в машиностроении: Волгоград: Издательский Дом «Ин-Фолио», 2009. — 640 с.</p>

	<ol style="list-style-type: none"> 2. Түсіпов, А. Материалдар кедергісінің есептер жинағы: Оқулық/ А. Түсіпов. - Алматы : ҚР жоғары оқу орындарының қауымдастығы, 2012. - 216 - (ҚР Білім және ғылым министрлігі). 3. Купцов А.М. Электротехника с элементами энергосбережения: Учебное пособие. – Томск: Изд-во НТЛ, 2003. – 344 с. 4. Аристова Л.И., Лукутин А.В.. Сборник задач по электротехнике: учебное пособие. – Томск: Изд-во ТПУ, 2010. – 107 с. 5. Кудинов В.А., Карташов Э.М. Техническая термодинамика. –М.; Высш.шк., 2000. –261 с.ил. 6. Денисенко В.И., Болдырева Л.П. ТОЭ1. Исследование линейных электрических цепей. Методические указания и задания к лабораторным работам для студентов специальности 5В0718 7. Ильинский Н.Ф., Козоменко В.Ф. Общий курс электропривода. – М.: Энергоатомиздат, 1992. 8. Москаленко В.В. Электрический привод. – М.: Мастерство: высшая школа, 2000. 9. Димов Ю.В. «Метрология, стандартизация, сертификация.» Питер 2010г. 10. Гришин А.Н. Режущий инструмент и металлорежущие станки. Уч.пособие, - Астана, КАТУ им.С.Сейфуллина, 2008г. 11. Кондрашова Р.Т. Курс лекций по дисциплине «Металлорежущие станки», - Астана, КАТУ имени С.Сейфуллина, 2010г.
8. Content of the discipline	The study of ferrous and non-ferrous metals and their alloys and non-metal; fundamentals of the theory of heat treatment of metals, their alloys and parts of technological machines and equipment; fundamentals of foundry production and pressure treatment of metals and plastics; metal welding; the basics of the existing processes of raising parts from the workpiece; the theory of cutting instrumental materials, their physico-mechanical bases of machining; machine tools and tools for cutting.
Name of the discipline	Heat engineering and thermodynamics basics
2. Number of credits	4

3. Prerequisites:	Mathematics, Physics, Electrical Machines and Drives
4. Postrequisites:	Profile disciplines
5. Competencies:	<p>should:</p> <p>A. be able to: design, select and operate the necessary heat engineering equipment of the sectors of the national economy.</p> <p>B. know: heat engineering terminology, laws of production and conversion of energy, methods for analyzing the efficiency of heat utilization, as well as the principles of operation and designs of thermoelectric equipment;</p> <p>C. The ability to understand the methods of obtaining, converting, transmitting and using heat, as well as the principle of operation and laws of transformation and properties of thermal energy, as well as the processes of heat propagation and the theory of heat transfer.</p>
6. Author of course	Umirzakov R.A.
7. General literature	<p>Умирзаков Р.А. Учебно-методический комплекс по дисциплине «Теплотехника», Астана: КазАТУ им. С. Сейфуллина, 2015.</p> <p>Теплотехника: учебник для вузов /В.Н. Луканин, М.Г. Шатров и др.; под ред. В.Н. Луканина. – М.: Высшая школа, 2000. – 671 с.</p> <p>Буров А.Л. Тепловые двигатели: М., 2008.</p>
8. Content of the discipline	The history of the development of heat engineering. The laws of obtaining and converting energy. Compressors, internal combustion engines, heat pumps. Heat conduction. Industrial heating devices and their classification. Heat exchangers.
Name of the discipline	Industrial Microcontrollers
2. Number of credits	5

3. Prerequisites:	Mathematics, Physics, Electrical Engineering, Electrical machines and drives
4. Postrequisites:	Pneumatic and hydraulic drives, CNC system (Fundamentals of mechatronics), Manipulators and robots
5. Competencies:	<ul style="list-style-type: none"> • the ability to compose mathematical models of systems, their subsystems and individual elements and modules, including information, electromechanical, hydraulic, electrohydraulic, electronic devices and computer equipment; • the ability to develop design and project documentation of nodes and systems in accordance with existing standards and technical conditions; • the ability to plan the commissioning, maintenance and testing of individual modules and subsystems, to participate in organizing and conducting installation, commissioning and maintenance at existing facilities and experimental models, as well as in processing the results of experimental studies
6. Author of course	Sarsikeev E.Zh.
7. General literature	<ol style="list-style-type: none"> 1. Сторожев, Владимир Васильевич Системотехника и мехатроника технологических машин и оборудования : монография / В. В. Сторожев, Н. А. Феоктистов. – Москва: Дашков и К, 2015. – 412 с. 2. Шидловский, Станислав Викторович. Автоматическое управление. Перестраиваемые структуры / С. В. Шидловский. — Томск: Изд-во ТГУ, 2006. — 288 с. 3. Медведев М.Ю. Программирование промышленных контроллеров: учеб. пособие / М.Ю. Медведев, В.Х. Пшихопов. – Москва: Лань, 2011. – 287 с. 4. Стрижак П.А. Микропроцессорные контроллеры и средства управления: учебник / П.А. Стрижак, Д.О. Глушков; Национальный исследовательский Томский политехнический университет (ТПУ). – Томск: Изд-во ТПУ, 2010. – 144 с.
8. Content of the discipline	<p>General information about controllers. Architecture and PLC types. Structure and device controllers ARIES. Programming and interface controllers ARIES. Additional modules ARIES. Installation of modules ARIES.</p> <p>Structure and device controllers SIEMENS. Programming and interface controllers SIEMENS. Additional modules SIEMENS. Installation of modules SIEMENS. Structure and design of Schneider Electric controllers.</p> <p>Programming and interface controllers Schneider Electric. Additional modules Schneider Electric. Installation of</p>

	Schneider Electric modules. Designing automation systems.
Name of the discipline	Pneumatic and hydraulic actuators
2. Number of credits	6
3. Prerequisites:	Physics
4. Postrequisites:	Metalworking machines and welding equipment. Hoisting machines, manipulators and robots.
5. Competencies:	A. Know the basics of hydraulics, hydraulic drives, hydraulic machines, hydraulic equipment and working fluids. B. To be able to count and choose hydraulic and pneumatic drives.
6. Author of course	Ajanov A.U.
7. General literature	С. Г. Ефимова, В. Т. Чупров. Гидравлика, гидро- и пневмопривод. Учебное пособие. Сыктывкар. СЛИ. - 2013.
8. Content of the discipline	Hydrostatics. Hydrodynamics. Volumetric hydraulic actuators. Working fluid. Volumetric hydraulic machines. Hydraulic equipment. Determination of parameters and the choice of hydraulic drive and hydraulic equipment. Pneumatic actuators. Calculation of pneumatic drives.
Name of the discipline	Manufacturing processes (ТМС+КТОИ)
2. Number of credits	5
3. Prerequisites:	Theory of mechanisms and machines. Agreecultural machines. Agreecultural equipment
4. Postrequisites:	Diploma design
5. Competencies:	Terms, definitions and concepts, indicators for assessing the quality of machines, technological characteristics of various types of production, errors of machining and methods for calculating them, the task of controlling the

	processing accuracy and reducing its errors, technological dimensional calculations, basing and bases in mechanical engineering, the impact of processing technology on the formation of surface layer and performance of machine parts, setting processing allowances, performs technical rationing of production costs owls.
6. Author of course	Magavin S.Sh.
7. General literature	1. Базров Б.М. Основы технолдогии машиностроения – М.:Машиностроение, 2005 – 736 с. 2. Маталин А.А. Технология машиностроения. Учебник – СПб:ЛАНЬ, 2010 – 512 с. 3. Справочник технолога машиностроителя. Под.ред. А.Г.Косиловой и Р.М.Мещерякова. – М.:Машиностроение, 1999. Т.1 – 694 с.
8. Content of the discipline	The discipline “Production Processes” aims to instill in students a complex of knowledge and skills about the nature and basic laws of the influence of the technological system on the accuracy of processing performance, on the impact of processing technology on the formation of the surface layer and the performance of machine parts, to produce technological dimensional calculations, to correctly base and assign bases when installing parts in the process of machining and assembly, assign allowances for machining and carries out technological rationing consumption of productive resources.
Name of the discipline	Measuring systems (ВЗСТИ)
2. Number of credits	4
3. Prerequisites:	general education disciplines, general measurement theory, metrology, standardization, engineering graphics.
4. Postrequisites:	machine use, methods of quality control and management, qualimetry, control in standardization, metrology and certification, metrological assurance of production.
5. Competencies:	Know and understand the procedure for constructing a unified system of tolerances and landings, the theory of accuracy calculations.

	<p>To be able to work with the main groups of measuring and control products, processes.</p> <p>To possess the rules of process control in the management of product quality based on regulatory and technical documentation.</p> <p>Acquire practical skills in the selection of measuring tools based on input information (accuracy, performance, etc.); be able to assess the metrological equipment of production, work on a system of tolerances and landings, designate standards for the accuracy of products.</p>
6. Author of course	Ivanchenko A.V.
7. General literature	<p>1.Сергеев А.Г., Латышев М.В., Терегеря В.В. Метрология, стандартизация, сертификация. Учебное пособие. – М.: 2003. –536 с.</p> <p>2. Сергеев А.Г., Крохин В.В. Метрология: Учебное пособие для вузов. – М.: Колос, 2000. – 408 с.</p> <p>3. Серый И.С. Взаимозаменяемость, стандартизация и технические измерения. – 2-е изд.. перераб. и доп. М.: Агропромиздат., 1987. –367 с.</p> <p>4. Иванов А.И. Технические измерения. Изд. 2-е, перераб. – М.: Колос, 1970.</p> <p>5. Якушев А.И. и др. Взаимозаменяемость, стандартизация и технические измерения. Учебник для ВТУЗов. – М.: Машиностроение - 1987. – 352 с..</p> <p>6. Допуски и посадки. Справочник в 2-х частях (под ред. Мягкова В.Д. и др.). Л.: Машиностроение, 1982</p>
8. Content of the discipline	<p>The concept of measuring and control. . Metrological characteristics of SI. Principles of choice of SI. Limiting errors of the most common universal measuring instruments. The concept of testing and control. Limit calibers. Rules of operation, setting SI, measurement methods. Device and operation of rod tools, micrometric and lever-mechanical tools. The use of SR in the repair industry and in the technical diagnostics of aggregates, assemblies and mechanisms of agricultural equipment. General principles of interchangeability. General principles for building a unified system of tolerances and landings (ESDP).</p>
Name of the discipline	Failure Analysis and Machine Repair

2. Number of credits	5
3. Prerequisites:	higher mathematics, computer science, descriptive geometry and engineering graphics, physics, theoretical mechanics, fundamentals of heat engineering, fundamentals of heat engineering, construction of tractors for automobiles. CAD, OKDM, resistance of materials, electrical engineering
4. Postrequisites:	-
5. Competencies:	To be able to develop and implement measures for maintaining and restoring the reliability, efficiency and resource of SH equipment with minimal labor and costs. To be able to ensure the effective use of technological machines, through current repairs and maintenance. Identify the causes of faults, damage and failures of machines, equipment and automation of technological and production processes and rules of safe work in the repair of machinery and equipment; organization of labor and production in repair and maintenance bases
6. Author of course	Mendaliyev S.I.
7. General literature	<ol style="list-style-type: none"> 1. Надежность и ремонт машин /Под ред.В.В. Курчаткина. - М.: Колос, 2000. - 776 с.: ил. 2. Кленин Н.И., Егоров В.Г. Сельскохозяйственные и мелиоративные машины.– М.: Колос, 2004.-464с. 3. Гуревич Л.А и др. Тракторы и сельскохозяйственные машины. – М.: Агропромиздат, 1986.-267 с. 4. Алиев Б. Тракторлар мен автомобильдер теориясы. - Алматы, 2005
8. Content of the discipline	The basis of wear parts, prediction of the causes of faults in the nodes, machines, on the progressive methods of their repair and restoration of the technology of repair of nodes, aggregates of machines, equipment.
Name of the discipline	Монтаж, испытание и эксплуатация технологических машин
2. Number of credits	5
3. Prerequisites:	Для эффективного освоения содержания дисциплины не обходимо знание дисциплин: математика; физика ;

	теоретическая механика; сопротивление материалов; основы технологии машиностроения; надежность технологических машин; монтаж и эксплуатация технологических машин.
4. Postrequisites:	Испытание с/х техники; проектирование предприятий технического сервиса; дипломное проектирование
5. Competencies:	В результате изучения данной дисциплины студенты должны знать; Причины возникновения неисправностей, повреждения и отказов машин, оборудования, методы их предупреждения выявления и устранения; Современные прогрессивные методы монтажа машин, технологические процессы ремонта и установления деталей, узлов, машин и оборудования в целом; Вопросы механизации и автоматизации технологических и производственных процессов и правил безопасной работы при монтаже машин и оборудования; Организацию труда и производства в подразделениях ремонтно-обслуживающей базы.
6. Author of course	Бабченко Л.А.
7. General literature	1. Батищев А.Н. и др. Монтаж, эксплуатация и ремонт технологического оборудования. – М:Колос. – 424 с. 2. Баутин В.Н. и др. Монтаж оборудования перерабатывающих предприятий. – М:Росинформагротех, 2002. – 184 с. 3. Беляев П.С. и др. Монтаж, эксплуатация и ремонт оборудования для переработки полимерных материалов. – Тамбов: Изд – во Тамб. Гос. Техн. Ун-та, 2006. – 92 с.
8. Content of the discipline. Discipline "Installation and operation of technological machines." Wear and aging of technological machines and equipment, system of scheduled preventive maintenance of equipment, installation and operation of technological machines, methods and methods for monitoring and restoring machine parts.	
Name of the discipline	Engineering economics
2. Number of	3

credits	
3. Prerequisites:	Economic disciplines
4. Postrequisites:	Section of Economics in thesis design
5. Competencies:	<p>As a result of studying this discipline, students should:</p> <p>know and understand: the essence of scientific and technological progress and the concept of engineering economics; the essence of the main and working capital of the enterprise; fundamentals of enterprise resource management and labor motivation; technical and economic analysis of production development; ensuring the competitiveness of production.</p> <p>be able to: apply theoretical knowledge in practice; correctly assess the situation on the market; plan and predict; - correctly assess their capabilities; decide; participate in the development of an innovative strategy of the organization, plan and implement activities aimed at its implementation;</p> <p>own: enterprise management skills; management methods at the enterprise; methods of building long-term and short-term strategy of the enterprise.</p>
6. Author of course	Alenova K.T., Ernazarova A.K.
7. General literature	<p>1. В.В. Кочетов, А.А. Колобов, И.Н. Омельченко Инженерная экономика. Учебник. «МГТУ им. Н.Э. Баумана». 2005</p> <p>2. В.В. Кочетов, А.А. Колобов, И.Н. Омельченко Инженерная экономика. Учебник. Изд-во МГТУ, 2011</p> <p>3. А. В. Колышкин [и др.] ; под ред. А. В. Колышкина, С. А. Смирнова. Экономика предприятия: учебник и практикум для бакалавриата и специалитета М. : Издательство Юрайт, 2018. — 498 с.</p> <p>4. Чалдаева, Л. А. Экономика предприятия : учебник и практикум для академического бакалавриата/Л. А. Чалдаева. — 5-е изд., перераб. и доп. — М. : Издательство Юрайт, 2015. — 435 с.</p>
8. Content of the discipline	<p>Scientific and technical progress and the concept of engineering economics. Production in a market environment. Fixed assets. Working capital Labor resources. Cost of production. Efficiency and quality of products. The system</p>

	of technical and economic calculations. Characteristics of innovation. Evaluation of the effectiveness of innovation. Technical and economic analysis of the development of production. Ensuring the competitiveness of production. Taxation. Investment and innovation activities of the enterprise. Finance companies.
Name of the discipline	Occupational Safety and Health
2. Number of credits	4
3. Prerequisites:	Physics, mathematics, chemistry, biology, human anatomy (fundamentals), basic hygiene, basic measurement and standardization, basic health and safety.
4. Postrequisites:	Work practice, pre-diploma practice, thesis design.
5. Competencies:	<p>A. Know and understand the decisions of the Government of the Republic of Kazakhstan, aimed at improving working conditions, life conditions, reducing injuries, morbidity, improving efficiency and productivity.</p> <p>B. Acquisition of practical skills in mastering methods of identifying and analyzing, working conditions and occupational safety, predicting and preventing accidents and occupational diseases at work.</p> <p>C. The ability to compare, formulate conclusions, build their own arguments, express and justify their position to create healthy and safe working conditions for workers in the agro-industrial production.</p>
6. Author of course	-
7. General literature	<p>1 Конституция Республики Казахстан от 30 августа 1995 года.</p> <p>2 Трудовой кодекс Республики Казахстан от 23 ноября 2015 года, №251 – III ЗРК.</p> <p>3 Зотов Б.И., Курдюмов В.И. Безопасность жизнедеятельности на производстве.- 2-е изд,-Москва: Колос С, 2004.</p> <p>4 Шкрабак В.С., Луковников А.В. Безопасность жизнедеятельности в сельскохозяйственном производстве. – Москва: Колос С, 2004.</p>

- 5 Хакимжанов Т.Е. Охрана труда: Учебное пособие для вузов.-Алматы: Эверо, 2006.
- 6 Охрана труда в электроустановках. /Под редакцией Б.А. Князевского. – Москва: 1981.
- 7 Кукин П.П., Лапин В.Л., Пономарев Н.Л., Сердюк Н.И. Безопасность жизнедеятельности. Безопасность технологических процессов и производств (ОТ). – Москва: Высшая школа, 2002.
- 8 Атаманюк В.Г., Ширшев Л.Г., Акимов Н.И. Гражданская оборона. – Москва: Высшая школа, 1986.
- 9 Безопасность жизнедеятельности: Учебник для вузов/С.В. Белов, А.В. Ильницкая, А.Ф. Козьяков и др.; под общей редакцией С.В. Белова. – Москва: Высшая школа, 1999.
- 10 Журавлев В.П., Пушенко С.Л., Яковлев А.М. Защита населения и территорий в чрезвычайных ситуациях. Москва: Изд-во АСВ/1999.
- 11 Зайцев В.П. Охрана труда в животноводстве. - Москва: Высшая школа, 1998.

8. Content of the discipline preparation 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 named after Seyfullin will have to work with. Development of civil activity in this state important for the Republic of Kazakhstan business.

Appendix 4 Description of elective disciplines

Basic information about the discipline:

1. Basic information about the discipline:	
Name of the discipline	Physical and colloidal chemistry
2. Number of credits	4
3. Prerequisites:	School chemistry
4. Postrequisites:	-
5. Competencies:	<p>A. The task of studying chemistry is that students accumulate a specific amount of knowledge on the discipline and form on this basis a logical “chemical” thinking that provides the future specialist with free orientation in the information flow and the ability to solve problems related to knowledge of chemistry.</p> <p>B. The knowledge gained in chemistry helps the future specialist of the agricultural sector to solve the 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.</p> <p>C. After the chemical experiments performed, the student should further generalize the results obtained, draw a conclusion from the obtained data.</p>
6. Author of course	
7. General literature	<ol style="list-style-type: none"> 1. Князев А.А., Смарьгин С.Н. Неорганическая химия. М.: ВШ, 2002. 2. Хомченко Г.П., Цитович И.К. Неорганическая химия. М.: ВШ, 1987. 3. Глинка Н.Л. Задачи и упражнения по общей химии. М.: ВШ, 1987. 4. Хомченко Г.П. Практикум по общей и неорг. химии. М.: ВШ, 1980.

	<p>5. Кудайбергенова С.Ж., Букеева А.Б. УМК по Химии, КАТУ, 2009</p> <p>6. Артеменко А.И. Органическая химия. Издательство: "Высшая школа", 2007</p> <p>8. Кудайбергенова С.Ж. Органическая химия. КАТУ, 2009.</p> <p>9. Кудайбергенова С.Ж., Букеева А.Б. УМК по органической химии. КАТУ, 2011, 2014</p> <p>10. Юровская М.К., Куркин А.В. Основы органической химии. 2012</p>
8. Content of the discipline	Expansion and deepening of knowledge in the course of chemistry, the study of the theoretical foundations of chemistry, the basic concept of chemistry, the fundamentals of qualitative analysis, the formation of the concept of the role of chemistry.
Name of the discipline	Basics of technology of processing industries
2. Number of credits	4
3. Prerequisites:	Physics, mathematics
4. Postrequisites:	Machines and equipment for processing plant products, Machines and equipment for processing animal products
5. Competencies:	<p>A. The ability to use in the practice of scientific research knowledge of the basic properties of food products and raw materials, the kinetic laws of the basic processes of food technology, the general principles of calculating devices;</p> <p>B. Acquisition of practical work skills, allowing to analyze the achievements of modern domestic and foreign science in this field;</p> <p>C. The ability to compare, formulate conclusions, build their own arguments, to express their position on the basic schemes, devices, principles of operation of the apparatus of processing enterprises;</p> <p>D. Formation of a sense of responsibility for compliance with the various modes of equipment operation under the conditions of the operating enterprise, as well as for ensuring environmental safety during the operation of the equipment of the processing enterprises;</p>

	E. Ability to perform basic calculations and find the optimal or rational modes of operation of the equipment of processing enterprises.
6. Author of course	Department of Technology of food and processing industries
7. General literature	1. V.A. Vorobiev, "Mechanization and Automation of Agricultural Production" M. Kolos S, 2004, 540 p. 2. A.A. Zangiev "Practical workshop on the operation of machine and tractor fleet" M. Kolos S, 2006, 317 3. V.A. Fedotov, "Technology of production of crop production", M. Kolos S, 201
8. Content of the discipline	Discipline studies: processes and devices of processing industries. General patterns of technological processes. Classification of processes of processing industries. Modeling of processes and devices. Basic similarity theory. Hydromechanical processes: crushing, cutting, sorting bulk materials, filtering, centrifuging; processes in the fluidized bed. Thermal processes: heating, cooling, condensation, evaporation. Mass transfer processes: the basics of the theory of mass transfer, sorption and desorption, crystallization, drying, distillation. Non-traditional processes and devices of processing industries. The main types of devices and their design features. Methods for calculating the operating parameters and justification of the modes of operation of technological equipment for the primary processing of raw materials processing plants.
Name of the discipline	Electrical engineering and electronics basics
2. Number of credits	5
3. Prerequisites:	Mathematics, physics
4. Postrequisites:	-
5. Competencies:	A. Knowledge and understanding of electrical terms, principle of operation, characteristics and parameters of semiconductor devices, transistor amplifiers, pulse, logic and digital devices.

	<p>B. The practical application of knowledge of the theoretical foundations of electrical engineering, electronics and microprocessor technology, the ability to understand technical devices, diagrams, tables, tests and graphs of electronic devices.</p> <p>C. Ability to make judgments on the choice of processes included in the electrical series, the evaluation of the choice of electrical circuits, electronic devices and appliances. Have appropriate judgment skills on the physical essences of the phenomena accompanying the process of AC and DC electricity conversion. To be able to evaluate ideas to form conclusions.</p>
6. Author of course	Department of Power Supply
7. General literature	<p>Bessonov L.A. Theoretical foundations of electrical engineering. Electrical circuits. - M.: Gardariki, 2006.-701 p.</p> <p>Bessonov L.A. Theoretical foundations of electrical engineering. Electromagnetic field. - M.: Gardariki, 2013.-317 p.</p> <p>Demirchyan K.S., Neyman L.R., Korovin N.V., Chechurin V.L. Theoretical foundations of electrical engineering. Vol.1, Vol.2 - St. Petersburg: Peter, 2004. - (Vol.1) 463 p., (Vol.2) 576 p.</p> <p>Demirchyan K.S., Neyman L.R., Korovin N.V., Chechurin V.L. Theoretical foundations of electrical engineering. T.3 - St. Petersburg: Peter, 2013.-377 p.</p>
8. Content of the discipline	In the study of the discipline provided fundamental training of the student in the field of general electrical engineering and electronics; Compliance with the disciplines of "mathematics", "physics" and "chemistry" and continuity in the use of computers in the educational process is observed, familiarity with the core problems of obtaining, transmitting and converting electrical energy, basic provisions on the electric drive and the modern electronic database used in automatic circuits management, skills and concepts of professional terminology, mandatory for the solid mastery of subsequent disciplines and the practical use of the knowledge gained in solving professionals tasks.
Name of the	Automated electric drive

discipline	
2. Number of credits	6
3. Prerequisites:	Descriptive geometry and engineering graphics, school physics course, mathematics
4. Postrequisites:	-
5. Competencies:	<p>A. To be able to connect electrical machines to the electrical network, conduct tests on electrical machines and electric drives, calculate the working and mechanical characteristics of electrical machines, select the type and power of electric motors for electric drives for various operating modes, and calculate electro-mechanical transients of electric drives.</p> <p>B. To know the device and principles of operation of electric machines of alternating and direct currents, the fields of application of electric machines of alternating and direct currents, the basics of the theory of starting, braking and regulating the angular frequency of rotation of alternating and direct current motors, control circuits for electric drives and starting protection equipment in steady and unstable modes.</p> <p>C. The ability to understand the schemes and elements of the main equipment, secondary circuits, protection devices and automation of power facilities in accordance with the terms of reference using standard design automation tools, the ability to carry out installation, adjustment, testing and commissioning of power and electrical equipment.</p>
6. Author of course	Sarsikeev E.Zh.
7. General literature	<p>1. Bessonov LA Theoretical foundations of electrical engineering. Electrical circuits. - M .: Gardariki, 2006.-701 p.</p> <p>2. Bessonov L.A. Theoretical foundations of electrical engineering. Electromagnetic field. - M .: Gardariki, 2003.-317 p.</p> <p>3 Pryanishnikov V.A. Electronics: Full course of lectures. - SPb .: CORONA print, Binom Press, 2006. - 416 p.</p>
8. The content of the discipline	Fundamentals of Intellectual Property Law. Types of intellectual property rights. International treaties.

The history of Kazakhstani legislation on the protection of intellectual property. The system of sources of legal regulation of relations related to the protection of intellectual property. International Patent System. World Intellectual Property Organization (WIPO). International conventions on intellectual property. the order of registration and filing an application for an invention and utility model, the procedure for consideration of applications in the patent office; types of decisions of the patent office on applications; the rights and benefits of inventors; concept and types of licenses, the economy of inventions. Drawing up and submission of the application. Drawing up claims and utility models. Preparation of an application for an invention, utility model and industrial design. Examination of the application. Issuance of a patent or certificate. Effects of patents and copyright certificates issued before the introduction of modern patent law. The rights of authors of inventions, utility models and industrial designs. Patent rights and their protection. Content of patent rights. Obligations of the patent holder.

Name of the discipline	Process automation and control systems
2. Number of credits	9
3. Prerequisites:	Physics, Electrical Engineering and Basic Electronics
4. Postrequisites:	CNC system, Modeling of processing industries, Production processes
5. Competencies:	Should know: Classification principle of operation, the main characteristics of automation and control. Must be able to: use technical automation equipment for building and diagnosing control systems. Must possess: the skills of choice, evaluation of automation with the aim of building automated systems. Must demonstrate ability and readiness: To know: Classification principle of operation, the main characteristics of automation and control. To be able to: use technical means of automation for building and diagnosing control systems. To possess: the skills of choice, evaluation of automation with the aim of building automated systems.
6. Author of course	Sarsikeev E.ZH.

7. General literature	<p>Academy, 2007. - 368 p.</p> <p>2. Integrated design and management systems in mechanical engineering: Structure and composition [Text]: study guide / T. Ya. Lazarev [et al.]. - Stary Oskol: TNT, 2010. - 236 with</p> <p>3. A. G. Shhirladze. Integrated systems of design and management [Text]: a textbook for universities / A. G. Shhirladze, T. Ya. Lazareva, Yu. F. Martem'yanov. - Moscow: Academy, 2010. - 348 p.</p> <p>4. Shishov O. V. Technical means of automation and control [Electronic resource]: a tutorial / O. V. Shishov. - Moscow: INFRA-M, 2012. - 397 p.</p>
8. Content of the discipline	<p>Evolutionary development of ACS TP structures. Software and hardware complexes based on controllers. Characteristics, Classification PTK. Features of the selection of PTC leading companies. Process control system. Software and hardware systems. Digital industrial networks. Requirements for DSP. Standard DSP. Common problems with the use of DSP. Devices for communication with objects. Normalizing converters. Discrete I / O Modules. Typical tools for organizing a man-machine interface. Frequency converters for motor control. Enterprise as a complete object of automation. Levels and tasks of enterprise management automation. Ways and means of integrating tasks and levels of ACS.</p>
Name of the discipline	Thermal and refrigeration equipment for food production
2. Number of credits	5
3. Prerequisites:	Mathematics, Physics, Electrical Machines and Drives
4. Postrequisites:	Profile disciplines
5. Competencies:	<p>know the main types of food processing equipment;</p> <p>know the basics of the kinetics and dynamics of the main technological processes;</p> <p>possess the skills and techniques of using this knowledge for theoretical and practical purposes;</p> <p>be able to perform calculations of processes, devices, machines;</p>

	<p>understand the essence of the main methods used in research equipment;</p> <p>have an idea of the current problems of technological equipment</p> <p>have sufficient skills to use the knowledge of equipment in the study of other academic disciplines;</p> <p>acquire skills in solving typical project objectives of the course.</p>
6. Author of course	Umirzakov R.A.
7. General literature	<p>Umirzakov R.A. Training complex on the discipline "Heat Engineering", Astana: KazATU them. S. Seifullin, 2015.</p> <p>Heat engineering: a textbook for universities / V.N. Lukanin, M.G. Shatrov et al .; by ed. V.N. Lukanina. - M .: Higher School, 2000. - 671 p.</p> <p>Burov A.L. Heat engines: M., 2008.</p>
8. Content of the discipline	<p>Equipment for heat and refrigeration. The role of heat transfer and mass transfer in technical processes. Thermal equipment in catering. Classification of methods of heat treatment in the OP. General principles of the device of thermal devices OP. Constructions of some types of heat apparatus in public catering. Devices for hydrothermal and heat treatment of grain, cereal crops and components of animal feed. Dryers in the food industry. Equipment for freezing food. Design features self-unloading separators. Fundamentals of the theory of centrifugal separation process. Basic requirements for heat exchangers. Features of plate and tube heat exchangers</p>
Name of the discipline	Lifting and transport installations of food production
2. Number of credits	5
3. Prerequisites:	Physics
4. Postrequisites:	Metalworking machines and welding equipment. Manipulators and robots.
5. Competencies:	A. Know the basics of hydraulics, hydraulic drives, hydraulic machines, hydraulic equipment and working fluids.

	B. To be able to count and choose hydraulic and pneumatic drives.
6. Author of course	Ajanov A.U.
7. General literature	S.G. Efimova, V.T. Chuprov. Hydraulics, hydraulic and pneumatic drive. Tutorial. Syktyvkar. SLI. - 2013.
8. Content of the discipline	Hydrostatics. Hydrodynamics. Volumetric hydraulic actuators. Working fluid. Volumetric hydraulic machines. Hydraulic equipment. Determination of parameters and the choice of hydraulic drive and hydraulic equipment. Pneumatic actuators. Calculation of pneumatic drives.
Name of the discipline	Machines and apparatus for processing animal products
2. Number of credits	5
3. Prerequisites:	Physics; maths; general chemistry; descriptive geometry and engineering graphics; computer graphics; material mechanics; engineering mechanics; design fundamentals
4. Postrequisites:	Machines and equipment for processing agricultural products; pre-diploma practice, thesis design.
5. Competencies:	<p>Know the zootechnical requirements for the mechanization of livestock; progressive technologies of production and preparation of feed, as well as factors affecting their quality; complexes of machines and technological equipment for the mechanization of technological, auxiliary and transport processes in animal husbandry and the basis for the design of production technological lines in animal husbandry, poultry farming and fur farming.</p> <p>From a position of a systematic approach, be able to correctly address the issues of mechanization of production processes on farms of various forms of ownership, design and complete production flow lines, manage installation and commissioning works, and evaluate the quality and efficiency of livestock mechanization tools.</p> <p>Possess the ability to assess the quality of work and the efficiency of using livestock machinery, compare, build your</p>

	own arguments, express your position on the choice of technologies and technological equipment, the principal ways of developing the mechanization of livestock production, the main issues of the technological process.
6. Author of course	Zaichko Grigory Anatolevich
7. General literature	<p>1. Kirsanov V.V., Murusidze D.N., Nekrashevich V.F., Shevtsov V.V., Filonov R.F. Mechanization and technology of animal husbandry. - M.: INFRA-M, 2014. - 584 p.</p> <p>2. Koba V.G., Braginets N.V., Murusidze D.N., Nekrashevich V.F. Mechanization and technology of livestock production. - M.: Kolos, 1999.</p> <p>3. Kazarovets N.F., Prischepov M.A., Abdyrov A.M., Nukeshev S.O., Mustafin J.J. Technologies and technical support of livestock production. - Astana: KATU them. S. Seifullin, 2013. - 475 p.</p>
8. Content of the discipline	Production and technological characteristics of livestock enterprises. Mechanization; water supply of farms and pastures, preparation and distribution of fodder and means of feed storage mechanization, milking farm animals, primary processing, milk processing, technological processes in sheep farming, technological processes in poultry farming, removal, transportation and preparation of manure for use. Machines and equipment for the preparation of feed and feed mixtures and the system for the formation of microclimate parameters in livestock buildings. Operation of machinery and equipment for livestock farms and the organization of their technical services. Technological bases for designing livestock breeding enterprises.
Name of the discipline	Designing of the enterprises of technical service
2. Number of credits	5
3. Prerequisites:	Mathematicians, Physicists, Chemistry.
4. Postrequisites:	Must know the basic provisions and initial materials for designing the methodology of integrated calculations, the

	number of repair and servicing impacts, as well as be able to do the calculation of the complexity of repairs and technical services, the calculation of the annual volume of work on the technological equipment of the technical service enterprise, the calculation of the main parameters of the technical service enterprise.
5. Competencies:	<ul style="list-style-type: none"> - choose the best option for the development and placement of the network of technical service facilities in the region; - to substantiate the composition of the repair and servicing enterprise or division and calculate its main parameters; - to calculate the number of employees, the number of jobs and choose the necessary technological equipment.
6. Author of course	Ajanov Aitukan Uvlovovich
7. General literature	<p>1. Designing an enterprise for technical service .: Tutorial. / MMMishin, P.N.Kuznetsov - Michurinsk: Publishing house MichAU, 2008. - 213 p.</p> <p>2. Varnapov V.V. Technical service of machines for agricultural purposes / V.Varnapov. - M.: Kolos, 2000. - 252 p.</p>
8. Content of the discipline	Repair and maintenance AIC. Types of enterprises and their characteristics. Organization of jobs. Fundamentals of the organization of repair and maintenance base, ways to improve it. General provisions and procedure for designing TCP. Specialization, concentration and cooperation of enterprises. Site selection for the construction of the enterprise. Planning capacity utilization. The optimal allocation of production resources. Calculation of the main indicators of technological solutions. The main provisions and initial materials for design. Fundamentals of calculation of technical service enterprises. Design of auxiliary production units. Features of the reconstruction and technical re-equipment of the PTS
Name of the discipline	Machines and equipment for processing of crop products
2. Number of credits	5
3. Prerequisites:	Mathematics, Physics, Engineering Mechanics, Descriptive Geometry and Engineering Graphics. Automated design

	of mechanisms
4. Postrequisites:	Patent law, Design Basics.
5. Competencies:	Know the basic methods of preparing crop products for processing; traditional and modern methods of processing crop production; factors affecting the safety of crop products; technological schemes for integrated processing of crop production and waste disposal.
6. Author of course	Askarova A.A.
7. General literature	<p>1. Akimov A.P. The choice of the optimal operating mode of the working propulsion bodies. // Questions of the theory and operation of machine and tractor fleet. - Perm, 1974, - p. 107.</p> <p>2. Bosoy E.S., Vernyaev OV Theory, design and calculation of agricultural machinery. M.: Mechanical Engineering, 1978. - 320</p> <p>3. Leaves G.E. Agricultural and land reclamation machines. M.: Agropromizdat, 1986. - 688</p> <p>4. Lurye A.B. Calculation and design of agricultural machinery. L.: Mechanical Engineering, 1977. 528</p>
8. Content of the discipline	<p>Methods for determining the forces acting on the working bodies, Requirements for the quality of technological operations performed by working bodies, Operational requirements, solution of mathematical models. Principles of execution of technological operations by the working body. The importance of combining operations for resource-saving technologies and the efficiency of the machine. The laws governing the calculation of working bodies. The relationship of the working bodies in the functional diagram of the machine or tool. Determining the number of working bodies and their location on the frame of the machine for high-quality execution of the technological process. The movement of the processed materials in accordance with the purpose of the machine, the sequence of location of the working bodies of the determination of the performance of the designed machine, Processes during the transition of material from one working body to another Their impact on the reliability of the technological process. Display of the functional structure on the diagram of the designed machine. Functional indicators of machines and units. Economic feasibility of modernization.</p>

Name of the discipline	Fundamentals of patenting and professional creativity
2. Number of credits	3
3. Prerequisites:	Descriptive geometry and engineering graphics, Computer graphics, Electric machines and drives, Dynamic processes in biological systems, livestock mechanization, CAD technological machines and equipment, Basics of design, Fundamentals of agricultural machinery.
4. Postrequisites:	Diploma design
5. Competencies:	<p>A. To be able to analyze the technical situation and find new technical solutions; own methods of enhancing creative thinking; to make applications for alleged inventions and utility models and to correspond with the patent office; conduct a patent search in the performance of course and degree design, as well as in research work. to make a report on scientific, technical and patent research with conclusions and recommendations on patent purity and patent ability of intellectual property objects.</p> <p>B. Know the basics of professional creativity; methods of enhancing creative thinking; planning inventive work in the Republic of Kazakhstan; concepts of invention and utility model. Laws on the protection of intellectual industrial property objects, on liability for violation of the rights of owners of security certificates to intellectual industrial property objects.</p> <p>S. To have the ability to decide, compare, formulate, draw conclusions, build your own arguments, express your position on the main issues of engineering systems modeling, professional creativity and patent science.</p>
6. Author of course	-
7. General literature	1. Conducting patent research [Electronic resource]: ref. allowance / A. D. Ishkov, A.V. Stepanov; by ed. A. D. Ishkov. 2013. 132 p. - ISBN 978-5-9765-1793-6

	<p>2. Measures to protect intellectual property: O.N. Zhuravleva. - M.: Alfa-M, 2014. - 192 pp.: 60x90 1/16.</p> <p>3. Agamagomedova, S. A. The foundations of the administrative mechanism for the protection of intellectual property rights: a cross-border aspect [Electronic resource]: S. A. Agamagomedova. - Penza: PGU Publishing House, 2013.</p> <p>4. Private International Law: Textbook / MM. Boguslavsky. - 6th ed., Pererab. and add. - M.: Norma, 2009.</p>
<p>8. Content of the discipline Fundamentals of intellectual property law. Types of objects of intellectual rights. The history of Kazakhstani legislation on the protection of intellectual property. The system of sources of legal regulation of relations related to the protection of intellectual property. International conventions on intellectual property. the order of registration and filing an application for an invention and utility model, the procedure for consideration of applications in the patent office; types of decisions of the patent office on applications; the rights and benefits of inventors; concept and types of licenses, the economy of inventions. Drawing up and submission of the application. Drawing up claims and utility models, utility models and industrial designs. Issuance of a patent or certificate. Effects of patents and copyright certificates issued before the introduction of modern patent law. The rights of authors of inventions, utility models and industrial designs. Patent rights and their protection. Content of patent rights. Duties of the patent holder.</p>	

Director of ДАВ

_____ N.A.Serekpayev

Head of the planning and organization of the educational process

_____ G.Zh.Soltan

Dean of the Department

_____ S.O.Nukeshev

Chairman of the methodical commission

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Head of Department Technological machines and equipment

_____ M.T.Userbayev