Non-commercial joint-stock company
«Kazakh National Agrarian Research University»

AGREED
Deputy Chairman of the Board
LLP «SPC of Agricultural Enginering»
_____ D.Karmanov
«04» 03 2024 y.

APPROVED
Chairman of the Board - Rector
_____ A. Kurishbaev
«27» 03 2024 y.

EDUCATION PROGRAM

«7M08701 - Agricultural machinery and technology»

Awarded degree: Master of Agriculture under the educational programme
«7M08701- Agricultural machinery and technology»
(scientific-pedagogical direction)

ALMATY, 2024 y.

Approved at the meeting of the Department "Agricultural machinery and mechanical engineering"
Protocol № 6 « 12 » 01 2024 y.

Head of the department _____ Zh.Zhumagulov

Considered at the meeting of the Academic Committee of the Faculty «Engineering - technical»
Protocol № 6 « 26 » 01 2024 y.

Chairman of the AC of the faculty _____ U. Ibishev

Reviewed by the Educational Methodological Council of the University and recommended to the Academic Council
Protocol № 4 « 01 » 02 2024 y.

Chairman of the EMC of the University _____ A. Abdyrov

The educational program was approved at a meeting of the Academic Council of KazNARU Protocol №. 9 dated " 01 " 03 2024 y.

Developers:

Dean of the faculty	L. Aldibaeva
Head department	Zh. Zhumagulov
PhD, professor	K. Kalym
Master's student	B. Nuretov
Graduation	D. Zhalel

Employers:
Deputy Chairman of the Board
LLP «SPC of Agricultural Enginering» D. Karmanov

Agreed:

Head of the educational program planning office Zh. Kussainova

Application

It is intended for the preparation of masters in the educational program "7M08701 - Agricultural machinery and technologies in NC JSC "Kazakh National Agrarian Research University".

Regulatory documents:

Law of the Republic of Kazakhstan on education Astana, Akorda, July 27, 2007 No. 319-III ZRK (with amendments and additions as of 01.01.2019)

State mandatory standard of higher and postgraduate education. Approved by the decree of the Government of the Republic of Kazakhstan dated October 31, 2018 No. 604

The classifier of areas of education and training with higher and postgraduate education, No. 569 13.10.2018 g;

Standard rules of activity of educational organizations that implement educational programs of higher and (or) postgraduate education, MES of the Republic of Kazakhstan dated October 30, 2018 No. 595.

Rules for the organization of the educational process on credit technology of training. Order of the MES of the Republic of Kazakhstan No. 563 dated October 12, 2018.

Industry qualifications framework

Professional standards for OP and types of production and technological activities (no. 20/46 of 20.01. 2014) and organizational and managerial activities (no. 20/47 of 20.01.2014)

Professional standard. Appendix No. 15 to the order of the Deputy Chairman of the Board of the National chamber of entrepreneurs of the Republic of Kazakhstan "Atameken" dated 26.12.2019 No. 263

The website of NCE Atameken http://atameken.kz/

1. Passport of the educational program

Code and classification of the field of education	**7M08 Agriculture and bioresources**
Code and classification of training areas	**7M087- Agro engineering**
Code and name of the educational program	**7M08701 - Agricultural machinery and technology**
Type of educational program	Current
Purpose of the educational program	
Moscow time level	7
The level on the NQF	7
ORC level	7
Number of the application to the license for the training direction	KZ42LAA00006720 05.07. 2019 y. Annex №10 from July 5, 2019
OP accreditation	23.12.2020-22.12.2025 KAZSEE
Name of the accreditation body	Master of Science in Agriculture under the educational programme 7M08701 - «Agricultural machinery and technology»
The period of validity of accreditation	Table 2
Degree awarded	Teacher in higher and secondary specialized, vocational and technical educational institutions of technical profile, scientific and managerial work in scientific and industrial institutions, managerial activities in the departments of district, regional, republican structures, managers, specialists and other employees in local and republican bodies of agricultural management, agricultural subdivisions, enterprises and organizations of various industries and forms of ownership.
Field of professional activity	Scientific and educational (pedagogical), methodological activities in educational organizations in the agroengineering profile, organizational and managerial, production and technological activities in various agricultural formations, processing enterprises, factories, local and republican management bodies of the agricultural sector.
Scope and object of professional activity	Organizations of higher and postgraduate education, research and design organizations. Machine-technology stations (MTS), social and business complexes(SPCs), processing and energy supply enterprises, machine-building and repair plants, local and republican agricultural management bodies.
Functions of professional activity	Undergraduates study innovative technologies and techniques in animal husbandry, design of machinery and equipment for animal husbandry, cluster production of livestock products, design of technological lines of livestock and processing enterprises, machinery and equipment. Undergraduates study innovative technologies

	and techniques in crop production, cluster systems for the production of crop products, theory and calculation of harvesting machines, machines and equipment for the preparation and storage of crop products, theory and calculation of tillage, sowing and planting machines, innovative technologies for the restoration of agricultural machinery parts.
Types of professional activities	Scientific and educational (pedagogical), methodological activities in educational organizations in the agroengineering profile, organizational and managerial, production and technological activities in various agricultural organizations, processing enterprises, factories, local and republican management bodies of the agricultural sector.
To be competent	In the field of methodology of scientific research in the issues of innovative technical and technological production in the field of agriculture, organization of the use of new agricultural machinery and equipments, in the field of scientific and scientific-pedagogical activities in higher educational institutions in questions of modern educational technologies in implementation of scientific projects and studies in the professional field in ways to ensure constant updating of knowledge, extend professional basketba-cov and skills, in the use of mathematical apparatus for solving the problems under study, in the use of computing equipment and software when performing scientific research and processing materials.

2. Learning outcomes EP

Codes	**Learning outcome**

LO1	Demonstrate a broad outlook in matters of psychology, find the best options in various psychological situations and make management decisions based on ethical standards taking into account social, ethical and scientific considerations
LO2	Use professional conversation in an international environment in English and maintain a conversation on a wide range of scientific, technical and pedagogical issues.
LO3	Demonstrate the basics of the methodology of scientific research, the principles and structures of the organization of scientific activity, the purpose of scientific research, apply the idea in the context of scientific research, critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena of agricultural production.
LO4	Master the basics of the production operation of agricultural machinery and equipment in crop production and animal husbandry, determine the indicators of the effectiveness of the use of machinery and equipment in production conditions, methods and devices of precision farming.
LO5	Apply energy - saving technologies and equipment in agricultural production, alternative energy systems, agriculture, innovative technologies in waste recycling in the production of objects of APK.
LO6	Demonstrate the use of technology and technical means of processing crop and livestock products in a market economy, the formation of a territorial and industrial cluster.
LO7	To introduce innovative technologies and techniques in the production and processing of livestock and crop products using advanced methods of the world experience of the cluster approach.
LO8	Plan and organize the technical operation of machinery and equipment in agricultural production, the use of modern devices and equipment for diagnostics, maintenance and repair of agricultural machinery, testing of agricultural machinery, analysis of the data obtained, clearly and unambiguously communicate information, ideas, conclusions, products and solutions.
LO9	Practice the transfer of scientific information using modern information and innovative technologies in the field of scientific and scientific-pedagogical activities.Be able to protect intellectual property rights for scientific discoveries and developments, and implement scientific developments in practical activities.
LO10	Apply the training skills necessary for independent continuation of training in the agricultural field, develop professional skills as well as communication and intercultural communication, and possess a foreign language at a professional level.
LO11	To use automated technological processes and simulate the planning of experiments, to provide equipment for the preparation and storage of crop products, with optimization of parameters and modes of operation of machines when performing mechanized production processes.

3. Content of the educational program

ПП	VK / KV	CodeofDiscipline	Name of the discipline that forms the competence	in academiccredits	Volumeinhours							Distribution of credits by course and semester				Department 1	formofcontrol
					inacademichours	Classroom				Extracurricular		1 course		2 course			
						Lectures	Workshops	Laboratoryclasses	Other (practice)	**SRTP**	**SRO**	1	2	3	4		
1	**TT**	**Theoretical training**		**88**	**2640**	**225**	**480**	**0**	**110**	**450**	**1375**						
CBD: UC/CC		**Cycle of basic disciplines: University component / Component of choice**		**35**	**1050**	**105**	**195**		**20**	**210**	**520**						
	CBC	**Cycle of basic disciplines**															
	UC	**University component**		**20**	**600**	**60**	**105**	**0**	**20**	**120**	**295**						
including:		**Module 1. Science communication and organization of the learning process in higher school**															
1	**UC**	HPS 7201	History and philosophy of science	**5**	150	15	30	0	0	30	75	5				29	exam
2	**UC**	FL 7202	Foreign language (professional)	**5**	150	15	30	0	0	30	75	5				14	exam
3	**UC**	HSP 7203	Higher School Pedagogy	**5**	150	15	30	0	0	30	75	5				6	exam
4	**UC**	PM 7204	Psychology of management	**3**	90	15	15	0	0	30	30		3			6	exam
5	**UC**	TP 7205	**Teaching practice**	**2**	60				20		40		2			6	отчет
	CC	**Component of choice**		**15**	**450**	**45**	**90**	**0**	**0**	**90**	**225**						

		Module 2. Technical service, resource-saving technologies and technical support															
1	**CC**	TSMEAH 7206	Technical service of machinery and equipment in animal husbandry	**5**	150	15	30	0	0	30	75	5				10	exam
		TSAH 7206	Technical support of animal husbandry	**5**	150	15	30	0	0	30	75	5				10	
2	**CC**	RSTEAH 7207	Resource-saving technologies and equipment in animal husbandry	**5**	150	15	30	0	0	30	75	5				10	
		RSTECP 7207	Resource-saving technologies and equipment in in crop production	**5**	150	15	30	0	0	30	75	5				10	
		Module 3. Testing of agricultural machinery and calculation of their parameters															
3		TAM 7208	Testing of agricultural machinery	**5**	150	15	30	0	0	30	75	5				10	exam
		TCTSPHM 7208	Theory and calculation of tillage, sowing, planting and harvesting machines	**5**	150	15	30	0	0	30	75	5				10	
CBD: UC/CC		**Cycle of basic disciplines: University component / Component of choice**															
	CSD	**Cycle of specialized disciplines**		**53**	**1590**	**120**	**285**	**0**	**100**	**240**	**845**						
	UC	**University component**		**20**	**600**	**60**	**120**	**0**	**0**	**120**	**300**						
		Module 4. Managing and modeling business solutions															
1	**UC**	PMFE 7309	Project management in the field of entrepreneurship	**5**	150	15	30	0	0	30	75		5			2	экзамен
2	**UC**	MSRAMT 7310	Methodology of scientific research in agricultural machinery and technology	**5**	150	15	30	0	0	30	75		5			10	экзамен
3	**UC**	MBS 7313	Modeling of business solutions	**5**	150	15	30	0	0	30	75			5		2	экзамен
4	**UC**	Con 7314	Conflictology	**5**	150	15	30	0	0	30	75			5		6	экзамен
		Component of choice		**23**	**690**	**60**	**165**	**0**	**0**	**120**	**345**						

		Module 5. Cluster production, machinery and technologies in animal husbandry															
1	**CC**	CPAH 7312	Cluster production in animal husbandry	**6**	180	15	45	0	0	30	90		6			10	Exam
		C3C3 7312	Cluster production in crop production	**6**	180	15	45	0	0	30	90		6			10	
2	**CC**	MEPLP 7315	Machinery and equipment for processing livestock products	**6**	180	15	45	0	0	30	90			6		10	
		ITEAH 7315	Innovative technologies and equipment in animal husbandry	**6**	180	15	45	0	0	30	90			6		10	
		Module 6. Modeling in agroengineering, automation of technological processes and storage of crop products															
1	**CC**	MA 7316	Modeling in agroengineering	**5**	150	15	30	0	0	30	75			5		10	Exam
		ATPAH 7316	Automation of technological processes in animal husbandry	**6**	180	15	45	0	0	30	90			6		10	
2	**KB**	MEPSCP 7317	Machinery and equipment for the preparation and storage of crop products	**6**	180	15	45	0	0	30	90			5		10	
		ETSCP 7317	Engineering and technical support of crop production	**5**	150	15	30	0	0	30	75			5		8	
1	**UC**	RP 60300	**Research practice**	**10**	**300**				**100**		**200**		**5**		**5**	10	report
2	**UC**	SRWM 603001	Scientific-Research work of a master	**24**	**720**				120		600		**4**	**3**	**17**		report
3		ATT	**Additional types of training**														
3.1	**UC**	FE	**final examination**	**8**	**240**				80		160				8		
1			Preparation and defense of a master's thesis														
			Total for MEP:	**120**	**3600**	**225**	**480**		**320**	**450**	**2125**	**30**	**30**	**30**	**30**		

Departmentnumber	**The name of the department**
1	Accounting, AuditandFinance
2	Management and organization of agribusiness
3	Right
4	Water resources and land improvement
5	"Machine use" named after I.V. Sakharov
6	Professionaleducation
7	Mechanics and design of agricultural equipment
8	Agrariantechnologyandtechnology
9	Information technology, mathematics and physics
10	EnergySavingandAutomation
11	LandResourcesandCadastre
12	Forest resources and hunting management
13	PlantProtectionandQuarantine
14	Foreignlanguages
15	KazakhandRussianlanguages
16	Soilscienceandagrochemistry
17	Ecology
18	Horticultureandwalnutgrowing
19	Agronomy
20	Biologicalsafety
21	ClinicalVeterinaryMedicine
22	Obstetrics, Surgery and Biotechnology Reproduction
23	Microbiologyandnon-virology
24	Veterinary-sanitary examination and hygiene
25	FoodTechnologyandSafety
26	Beekeeping, poultry farming and fisheries
27	Technologyoflivestockproduction
28	"Physiology, morphology and biochemistry" them. BUT. Bazanova
29	The history of Kazakhstan and the culture of the peoples of Kazakhstan
30	Physicaleducationandsport
31	MilitaryDepartment

Competence of scientific and pedagogical magistracy directions
"7M08701 - Agricultural machinery and technology»

Description of competence	Type of competence	№ competence
Formation of students' need for knowledge and skills of a managerial nature and professionally important qualities of future specialists;	PC	1
In matters of organization of technical service, evaluation of the efficiency of resource-saving equipment of production processes.	PC	2
In the technical support of animal husbandry using resource-saving technologies and techniques in technological processes.	PC	3
Be competent in the basic issues of testing agricultural machinery, carry out an energy assessment of machinery and equipment.	PC	4
In matters of methodological and theoretical knowledge of the basics of the formation of cluster production of livestock and crop products.	PC	5
To have a scientific and methodological level of knowledge about scientific research, achievements in research and innovation, targeted scientific programs, the formation of complex research programs, in assessing the reliability of forecasts when making decisions based on them, determining the effectiveness of the program of	PC	6
In matters of organizing the operation of machinery and equipment for processing livestock products.	PC	7
In matters of modeling in agroengineering and automation of technological processes in animal husbandry and preparation and storage of crop products.	PC	8
Ability of undergraduates to use special computer products quickly master modern computer programs; professional knowledge of computer programs under the direction of HOSP	PC	9
In matters of organizing the use of innova-tive technology, evaluation of their perfor-mance.	PC	10
In the formation of the compilation of design and technical documentation of agricultural production.	PC	11
In the formation of industrial-innovative cluster, in the selection of cluster sections, in the structure and principles of territorial-industrial cluster formation, in the techno-logical processes of the cluster.	PC	12
Be able to analyze the state and prospects of development of animal husbandry and crop production and their engineering and technical support of production processes	PC	13
In matters of organizing the use of innovative technology, evaluating their performance.	PC	14
Formation of concepts about the systems of automated technological process of the agricultural sector and familiarization with the main regulatory documents, norms of automation systems.	PC	15

4. Map of competence modules

Basic competencies	Learning Outcomes
Module 1. Science communication and organization of the learning process in higher school. Knowledge of the history and philosophy of the development of science Ability to conduct a professional conversation in an international environment in English Ability to lead a reasoned conversation on a wide range of scientific issues - The ability to demonstrate horizons in matters of the philosophy of science, psychology and pedagogy	The ability to demonstrate horizons in matters of philosophy of science, psychology and pedagogy, to use modern methods of teaching electrical engineering disciplines and labor protection, to find the best options in various psychological situations and make management decisions - Ability to conduct a professional conversation in an international environment in English, the ability to maintain conversation on a wide range of scientific, technical and pedagogical issues
Module 2. Technical service, resource-saving technologies and technical support. In matters of organization of technical service, evaluation of the efficiency of resource-saving equipment of production processes. In the technical support of animal husbandry using resource-saving technologies and equipment in technological processes.	To know the basics of the production operation of agricultural machinery and equipment in crop production and animal husbandry. Be able to determine the efficiency indicators of the use of machinery and equipment in production conditions, be able to apply energy- and resource-saving technologies and equipment in the production of livestock products in production conditions; Be competent in the use of precision farming methods and devices, be competent in the implementation of innovative technologies in waste disposal in livestock production facilities.
Module 3. Testing of agricultural machinery and calculation of their parameters. Be competent in the basic issues of testing agricultural machinery, carry out an energy assessment of machinery and equipment. The ability to justify the parameters of energy-saving equipment and technologies in agriculture.	To master the basics of the production operation of agricultural machinery and equipment in crop and livestock production, to determine the indicators of the effectiveness of the use of machinery and equipment in production conditions, methods and devices of precision farming.
Professionalcompetencies	**learningOutcomes**
Module 4. Managing and modeling business solutions - Ability to organize and lead the work of a team of scientific, engineering and technical workers, readiness for leadership and ensuring a normal psychological climate - Ability to assess the conditions and consequences of organizational and managerial decisions and the ability to model business processes - Participate in the planning and preparation of an internal energy audit and conduct an analysis of the existing management system at a particular enterprise; Ability to demonstrate business qualities when modeling business decisions, the ability to effectively manage business	control the psychological climate in the production team be able to develop and justify business projects to conduct an energy audit and develop measures for energy saving and management find and evaluate new market opportunities and substantiate business ideas make the right management decisions in business.

Module 5. Cluster production, machinery and technologies in animal husbandry. In the formation of an industrial and innovative cluster, in the selection of cluster sites, in the structure and principles of the formation of a territorial and sectoral cluster, in the technological processes of a cluster. In matters of organizing the use of innovative technology, evaluating their performance.	To demonstrate the use of technology and technical means of processing crop and livestock products in a market economy, the formation of a territorial and sectoral cluster. To introduce innovative technologies and techniques in the production and processing of livestock and crop products using advanced methods of the world experience of the cluster approach. Be able to ensure the application of technology and technical means of processing crop and livestock products in a market economy. Be competent: in the formation of a territorial and industrial cluster, in the technological processes of cluster production.
Module 6. Modeling in agroengineering, automation of technological processes and storage of crop products. In matters of modeling in agroengineering and automation of technological processes in animal husbandry and preparation and storage of crop products. Be able to analyze the state and prospects of the development of animal husbandry and crop production and their engineering and technical support of production processes. Formation of concepts about the systems of automated technological process of the agricultural sector and familiarization with the main regulatory documents, norms of automation systems.	Use automated technological processes and simulate the planning of experiments, provide equipment for the preparation and storage of crop products, with optimization of machine parameters and operating modes when performing mechanized production processes. Be able to ensure the application of technology and technical means of processing crop and livestock products in a market economy.

5. Summary table showing the volume of disbursed loans in the context educational program:

Course of Study	Semester	Number of disciplines studied				Number of academic credits					Total	Total in academic hours	Amount	
		CS		MS		Theoretical classes	Teaching practice	Research scientific training	RWMDS	The final assessment			Exam	Report
		UC	OC	UC	OC									
I	1	3	3			30					30	900	6	
	2	1		2	1	19	2	5	4		30	900	4	2
II	3			2	3	27			3		30	900	5	1
	4							5	17	8	30	900		2
Total		**4**	**3**	**4**	**4**	**76**	**2**	**10**	**24**	**8**	**120**	**3600**	**15**	**5**

Information about disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Semester	Emerging competencies
1	**Theoretical training**		**88**		
	Core Subjects Cycle University component / Optional Component				
1.1	**Core Subjects Cycle (CS)**		**35**		
1)	**University component (UC):**		**20**		
	including:	**Module 1. Science communication and organization of the learning process in higher school**			
1.1.1	History and philosophy of science	The course «History and philosophy of science» is compulsory for all specialties of the magistracy. It forms undergraduates ' culture of scientific thinking, develops analytical skills and research activities, gives theoretical and practical knowledge necessary for the future scientist. The study of the discipline is important in an era of increasing urgent need for science and scientists. «History and philosophy of science» introduces the problem of the phenomenon of science as a subject of special philosophical analysis, forms knowledge about the history and theory of science; on the laws of science and the structure of scientific knowledge; on science as a profession and social Institute; on the methods of scientific research; on the role of science in the development of society.	**5**	1	***Tobecompetent:*** - organization and functioning of science; - in the production of knowledge, patterns of formation and development of scientific disciplines; - in the formulation and solution of problems arising in the course of research activities; - in the application of methodological and methodical knowledge, scientific research, pedagogical and educational work; - in writing scientific articles, abstracts, presentations at conferences, symposia.
1.1.2	Foreign language (professional)	The main goal of the discipline is the systematic deepening of communicative competence in the framework of international standards of foreign language education based on the further development of the skills and abilities of active proficiency in English in the professional activities	**5**	1	***Tobecompetent:*** - work with lexicographic sources in a foreign language (traditional and on-line).

		of the future master of sciences. Development of a master student skills: - reading literature in English in the specialty for the receipt and transmission of scientific information; - registration of the extracted information in the form of translations, annotations, abstracts; - conducting conversations in English on topics related to the specialty and scientific work of the master's program student.			
1.1.3	Higher School Pedagogy	The course "Pedagogy of Higher Education" is obligatory for all specialties of the magistracy. This course examines pedagogical science and its place in the system of human sciences, the modern paradigm of education, the system of higher education in Kazakhstan, education and the formation of the personality of a specialist, and management in education. An idea of the methodology of pedagogical science, methods and forms of education is given.The study of the discipline contributes to the disclosure of professional and communicative competence of the teacher. Discipline builds knowledge about the theory of learning, the content of education, the organization of the learning process, the organization of the Independent student work. It also forms ideas about new educational technologies, technology for compiling teaching materials. Discipline develops ideas about the theory of scientific activity, self-study student under the guidance of a teacher.	**5**	1	***To be competent:*** - solving problems of higher pedagogical education and prospects for its further development; - questions of the use of effective university technology education; - the main types of pedagogical communicative interaction; - solving actual psychological and pedagogical problems, evaluating the achieved results; - organization and management of students.
1.1.4	Psychology of management	Discipline examines the subject, nature, tasks and structure of management psychology, methods of psychological research and basic approaches to its study. Examines the psychology of the subject of	**3**	2	***To be competent:*** -formation of students' need for knowledge and skills of a managerial nature and professionally important qualities of future

		management, the psychology of cognitive activity, perceptual, mnemic, thought processes in management. The course forms ideas about etiquette in the activity of a modern business person, communicative competence of a manager, emotional and volitional states in management activities and ability to manage activities.			specialists; - formation of students' understanding of the basics of management; -the development of independence in the search for information; -the use of adequate methods of personality research; -practical use of the obtained psychological knowledge in various conditions of management.
1.1.5	Teaching practic	Teaching activities, preparation and implementation of lesson plans, development of teaching materials	**2**	2	***To be competent:*** - in topical issues of modern higher education and pedagogical science; - in the socio-psychological nature of pedagogical activity;
2)	**Optional Component (OC)**		**15***		
	Module 2. Technical service, resource-saving technologies and technical support				
1.1.6	Technical service of machinery and equipment in animal husbandry	The discipline studies the basics of industrial operation of technological equipment in animal husbandry and their maintenance. The discipline also provides production conditions for the use of machinery, operational properties of livestock machines and equipment, including machine performance, and indicators of the effectiveness of the use of machinery in livestock farming.	**5**	1	***To be competent:*** in matters of organization of engineering and technical service; assessment of the efficiency of the equipment of production lines.
1.1.7	Technical support of animal husbandry	The discipline is devoted to the mechanization of processes in animal husbandry, machines and equipment for the preparation and distribution of feed, milking and primary milk processing, removal and disposal of manure on the farm, an analysis of the designs and working processes of these machines is given, a theoretical calculation and a method for choosing machines is given. The mechanization of production lines in animal husbandry, the design schemes and working	**5**	1	***To be competent:*** - in the ability to develop and improve the systems of engineering and technical support of animal husbandry; - in possession of the technique of evaluating technologies and means of engineering and technical support of animal husbandry using modern technical means; - in the formation of engineering structures in agribusiness with the provision of

		processes of machines and equipment for the preparation and distribution of feed, milking and primary milk processing, the issues of optimizing their parameters, the issues of their theoretical calculation and selection methods are highlighted, considerable attention is paid to the trends in the development of technology for the belly is a novelty. Special attention is paid to the automation and robotization of processes, the creation of intelligent technology and the development of production technologies based on them.			reliability management of technological systems of animal husbandry.
1.1.8	Resource-saving technologies and equipment in animal husbandry	Modern resource-saving technologies for the production of livestock products are described, descriptions of new generation technical means and principles of functioning of information systems are given. The general trends in the development of machine technologies and technological processes and equipment in animal husbandry, as well as technological processes and equipment in poultry farming, including technologies for keeping birds, are presented.	**5**	1	***To be competent:*** be competent in the implementation of innovative technologies in waste disposal in livestock production facilities.
1.1.9	Resource-saving technologies and equipment in in crop production	Modern resource-saving technologies of production in crop production are described, descriptions of new generation technical means and principles of functioning of information systems are given. The general trends in the development of machine technologies and technological processes and equipment in crop production are given.			***To be competent:*** be competent in the implementation of innovative technologies in waste disposal in crop production facilities.
	Module 3. Testing of agricultural machinery and calculation of their parameters				
1.1.10	Testing of agricultural machinery	The discipline considers the types and content of tests, a general idea of the patterns of functioning of agricultural machinery, energy, agrotechnical, operational and technological assessment of tested agricultural machinery and equipment. The methods of mathematical modeling, forecasting,	**5**	1	***To be competent:*** - be competent in the main issues of technical expertise To carry out an energy assessment of machinery and equipment.

		assessment of reliability, safety of working conditions are considered.			
1.1.11	Theory and calculation of tillage, sowing, planting and harvesting machines	This discipline is based on the basic principles of physics, mathematics, the theory of calculation of tillage and sowing, planting and harvesting machines, the basics of designing technological processes and machines for crop production. The study of the discipline is based on the knowledge gained by students in the direction 6B08701 – Agricultural machinery and technology.	**5**	1	***To be competent:*** - in the designs of advanced machines and technological complexes; - in carrying out technological and operational calculations of individual units and mechanisms of mechanization means; - in computer-based design of new working bodies, machines and their technological processes.
	Major Subjects Cycle (MS) University component / Optional Component				
1.2	**Major Subjects Cycle (MS)**		**53**		
1)	**University component (UC):**		**20**		
	Module 4. Managing and modeling business solutions				
1.2.1	Entrepreneurship project management	The history of the development of project management methods; methodological approaches to decision-making on the development of a project concept, its structuring and evaluation; mastering the role of the project manager at various stages of the project life cycle; introduces the organizational forms of project management and methods of their development and optimization. Training of students in the system of the sphere of the agro-industrial complex in market conditions. He forms economic thinking, entrepreneurial abilities, the ability to find your market niche, open your own business, organize and effectively manage your own enterprise	**5**	2	***To be competent:*** - the ability to independently acquire new knowledge using modern information technologies, the ability to work in a team, lead people and obey, the ability to negotiate; - in finding and processing information, using information tools and technology, the ability to carry out calculations and draw conclusions; in possession of the terminology, basic norms and standards governing the activities of organizations in the field of planning and project management.
1.2.2	Methodology of scientific research in Agricultural machinery and technology	The disciplines are intended for undergraduates. The discipline presents the main stages of the development of science and the main provisions of the methodology of scientific research; general scientific and special methods of conducting modern scientific research; the basic principles of	5	2	***To be competent:*** - have a scientific and methodological level of knowledge about scientific research, achievements in research and innovation activities, targeted scientific programs, the formation of comprehensive research

		organizing and planning the scientific work of undergraduates and general requirements for the structure, content, language and design of master's scientific papers.			programs, in assessing the reliability of forecasts when making decisions based on them, determining the effectiveness of the program for the development of scientific activity, in the independent conduct of scientific research, design and implementation of its results.
1.2.3	Business Solutions Management	Familiarization with the decision-making process, starting from the formalization of the initial problem, through the construction and solution of a mathematical model on the computer to the analysis of the decision and the formation of management decisions. Formation of skills in the construction and solution of mathematical models and analysis of these solutions on the computer. Consideration of production, transport and financial models of problems for the choice of management decisions	4	3	***To be competent:*** - the ability to independently acquire new knowledge using modern information technologies, the ability to work in a team, lead people and obey, the ability to negotiate; - in finding and processing information, using information tools and technology, the ability to carry out calculations and draw conclusions; in possession of the terminology, basic norms and standards governing the activities of organizations in the field of planning and project management.
1.2.4	Conflictology	Discipline examines the main categories of conflictology, the typology of conflict technology conflict management. The course studies theories of the behavior of an individual in a conflict, the technologies of effective communication and rational behavior in a conflict. Forms an understanding of the psychology of the negotiation process on conflict resolution, mediation as a technology for conflict resolution. Also considers conflicts in society, conflicts in organizations, conflicts and stress.	4	3	***To be competent:*** - diagnosing and preventing conflicts. - the use of basic methods and technologies for the prevention and resolution of conflicts; - using the principles of analysis and management of organizational conflicts; - possession of various ways of resolving conflict situations on the basis of modern personnel management technologies.
2)	**Component of choice (CC)**		**23***		
Module 5. Cluster production, machinery and technologies in animal husbandry					
1.2.5	Cluster production in	The discipline presents the main technologies and	6	3	***To be competent:***

	animal husbandry.	technical means of production of modern livestock products, as well as the scientific foundations of machine technologies for the production and processing of livestock products, cluster production of livestock products			- in the structure and principles of territorial-branch cluster formation, in technological processes of cluster production.
1.2.6	Cluster production in crop production	The discipline presents the main technologies and technical means of production of modern crop production, as well as the scientific foundations of machine technologies for production and processing of products, cluster production of crop production.	**6**	3	***To be competent:*** - in the formation of industrial-innovative cluster, in the selection of cluster sections, in the structure and principles of territorial-industrial cluster formation, in the technological processes of the cluster.
1.2.7	Machinery and equipment for processing livestock products	The discipline examines in detail modern technological equipment for the preparation and processing of livestock products, outlines the basics of working processes, the principle of operation, the device and technical data of machines and devices for processing raw materials of animal origin. The description of the main types of equipment is accompanied by technological calculations.	6	3	***To be competent:*** - in matters of organizing the operation of machinery and equipment for processing livestock products.
1.2.8	Innovative technologies and equipment in animal husbandry	The main technological processes in animal husbandry, their current state and prospects for mechanization. Innovative methods in the technology of forage harvesting in crushed form. Winding of rolls and bales, hay, ways to improve the quality of silage and haylage. Technologies and units for the production of vitamin supplements. Preparation of complete feed mixtures for animals and poultry	6	3	***To be competent:*** - in matters of the organization of the use of innovative technology, assessment of their effectiveness.
Module 6. Modeling in agroengineering, automation of technological processes and storage of crop products					
1..2.9	Modeling in agroengineering	The discipline presents the issues of modeling and statistical methods of planning experiments to optimize the parameters and operating modes of machines when performing mechanized production processes while conducting classroom and independent work. The stages of selecting	**6**	3	***To be competent:*** - in matters of modeling in agroengineering and automation of technological processes in animal husbandry and preparation and storage of crop products.

		dependent and independent variables, factorial and second-order plans, symmetric composite plans of various types, methods of statistical processing of experiment results, analysis of second-order models, conversion of second-degree equations to a canonical form and construction of various response surfaces are consistently considered.			
1.2.10	Automation of technological processes in animal husbandry	The theory of building automated control and regulation systems, as well as the methodology for synthesizing automatic control systems for production lines, and the principles of their implementation on programmable logic controllers are described. The requirements for the documentation of the automation project are given. Automated control systems for typical technological processes of livestock production are described.			***To be competent:*** - in the formation of concepts about the systems of automated technological process of the agricultural sector and familiarization with the main regulatory documents, norms of automation systems.
1.2.11	Machinery and equipment for the preparation and storage of crop products	The discipline contains machines and equipment for the preparation and storage of crop products. Intensive methods of crop production, modern technical means and equipment for the mechanization of production (preparation, preparation), transportation, processing and storage of crop production, as well as the experience of far abroad and CIS countries in the development of science on the mechanization of crop production are considered.	**5**	3	***To be competent:*** - in matters of modeling in agroengineering and automation of technological processes in animal husbandry and preparation and storage of crop products.
1.2.12	Engineering and technical support of crop production	The discipline provides an overview of engineering tasks related to ensuring the life cycle stages of agricultural machinery and mechanized crop production processes. The analysis of the development of the engineering infrastructure of the village in the second half of the XX and at the beginning of the XXI century is given. The existing design methods and mathematical models of			***To be competent:*** - in possession of techniques for evaluating technologies and means of engineering and technical support of crop production using modern technical means; - in the formation of engineering structures in agribusiness with the provision of reliability management of technological

		engineering services of agricultural enterprises are considered, new criteria for evaluating the work of services are proposed and their role in managing the reliability of technological systems of crop production is highlighted.			systems of crop production.
3)	Research scientific training	The research practice of a master's student is conducted in order to get acquainted with the latest theoretical, methodological and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data.	**10**	2,3,4	**To be competent:** - the ability to use skills in the organization of research and scientific work; - the ability to independently learn new research methods, to use the methods of science in their professional activities
2	**Research work by a Master s Degree student**		**24**		
1)	**Research work for the Master's Degree including an internship and a Master's Thesis (NIRM)**	The purpose of R & D is to provide undergraduates with primary professional skills and skills for organizing, conducting and presenting the results of research work.	24	1, 2, 3, 4	**To be competent:** - The ability to organize their work on a scientific basis, independently evaluate the results of their activities, possess the skills of independent work in the field of scientific research - Ability to generalize, analyze, critically comprehend, systematize, predict when setting goals in the field of professional activity
4	**Final assessment (FA)**	The purpose of the final state certification is to establish the level of competence formation of a graduate of a higher educational institution and his readiness to perform professional tasks	**8**	8	**To be competent:** - application of the obtained theoretical knowledge; - the ability to conduct research, systematize the results obtained and formalize them correctly
1)	**Preparation and defense of the Master's Thesis (PDMT)**		**8**	**4**	
	TOTAL:		**120**		

Application EP

Application 1

Bases of practice of the educational program
«7M08701 - Agricultural machinery and technology»

№	The name of the companies, enterprises, organizations	Contacts, phone, e-mail
1	Amiran-Agro LLP	Almaty region, Talgar district. Tel.:8(72774)42301,факс:8(727)3074822 e-mail: amiran_almaty@mail.ru
2	Baiserke-Agro LLP	Almaty region, Ili district, Baiserke village Kunaev street 1 Tel.:87019916120, 87018813379 e-mail: bajserke-agro.all.biz
3	PF " Mamed»	Almaty region, Karasai disrict. Tel.:8(727)3728617, 87016664751 e-mail: kalit50@mail.ru
4	SPC "Agroengineering" LLP»	050005, 312 Rayymbek Ave., Almaty, Tel.:8(727)2479600; факс:8(727)2479607 e-mail: kazniimech@yandex.kz
5	Engstroyinnovation A-A LLP	0500000 Almaty, Dosmukhamedov str. 11/32 Tel.:8(327)3174061; факс: 8(727)2380721 e-mail: isi-aa@mail.ru
6	Almaz-trans LLP	010000 Almaty, Rodostovets str. 120 Tel.: 8(7272)961313