

**MINISTRY OF AGRICULTURE OF THE REPUBLIC OF KAZAKHSTAN  
"NJSC "S. SEIFULLIN KAZAKH AGROTECHNICAL UNIVERSITY"**

Approve  
NJSC "Saken Seifullin Kazakh  
Deputy Chairman of the Management  
Board Academic Activity-Rector  
\_\_\_\_\_ A.M Abdyrov.  
« \_\_\_\_\_ » \_\_\_\_\_ 2021.

**CATALOG OF ELECTIVE COURSES**

For students in groups of educational programs

technological machines and equipment

**Nur-Sultan, 2021**

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Brief description of elective disciplines of the educational program

Basics of Biostatistics and Bioinformatics

1	Name of course	Agreeculturalmachines
2	Code of course	SM 2215
3	Cycle of course	BD
4	Amount of credits	5
5	Level of preparation	Undergraduate studies
6	Department	Agricultural machinery and technology
7	Year	3
8	Prerequisites	Fundamentals of wheeled and tracked vehicles, Animal husbandry mechanization, Agricultural engineering technology
9	Postrequisites	Installation, testing and operation of technological machines, Metalworking machines and welding equipment, Design of mechanical assembly shops
10	Course summary	Methods for determining the forces acting on working bodies, Requirements for the quality of technological operations performed by working bodies, Operational requirements, solving mathematical models. Principles of performing technological operations by a working body The importance of combining operations for resource-saving technologies and machine efficiency regularities of calculating working bodies The relationship of working bodies in the functional scheme of a machine or tool. Determination of the number of working bodies and their location on the machine frame for high-quality performance of the technological process. The movement of the processed materials in accordance with the purpose of the machine, the sequence of the location of the working bodies determining the performance of the designed machine, the processes during the transition of the 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 aggregates. Economic feasibility of modernization.
11	Learning outcomes	Be able to design and calculate the working bodies and main mechanisms of agricultural machines, calculate the cost of the designed machine and evaluate the technical and economic performance indicators. Develop and design rational schematic diagrams of machines and technological complexes in accordance with the requirements of the technical specification

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Brief description of elective disciplines of the educational program

Business activities

1	Name of course	Electrical engineering and bases of electronics
2	Code of course	EOE 2216
3	Cycle of course	BD
4	Amount of credits	5
5	Level of preparation	Undergraduate studies
6	Department	Power supply
7	Year	2
8	Prerequisites	Physics, mathematics
9	Postrequisites	Automated electric drive, Electric Machines and Drives, Industrial Controllers, CNC System (Fundamentals of Mechatronics)
10	Course summary	When studying the discipline, the fundamental training of the student in the field of general electrical engineering and electronics is provided; there is a connection with the disciplines "mathematics", "physics" and "chemistry" and continuity in the use of computers in the educational process, there is an acquaintance with the core problems of obtaining, transmitting and converting electrical energy, basic provisions on electric drive and modern electronic base used in automatic control schemes, skills and concepts of professional terminology required for the solid assimilation of subsequent disciplines and the practical use of the acquired knowledge in solving professional problems.
11	Learning outcomes	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

1	Name of course	Electric machines and drives
2	Code of course	EMP 1212
3	Cycle of course	BD
4	Amount of credits	5
5	Level of preparation	Undergraduate studies
6	Department	Operation of electrical equipment
7	Year	2
8	Prerequisites	Descriptive Geometry and Engineering Graphics, Physics, Mathematics, Electrical Engineering and the Basics of Electronics
9	Postrequisites	Industrial controllers, CNC System (Fundamentals of Mechatronics)
10	Course summary	<p>Fundamentals of Intellectual Property law. Types of intellectual property rights objects. International agreements. The history of the development of Kazakhstan's 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 issues. procedure for registration and filing of an application for an invention and utility model, procedure for consideration of applications in the patent office; types of decisions of the patent office on applications; rights and privileges of inventors; the concept and types of licenses, the economy of inventions. Preparation and submission of the application. Preparation of claims and utility models. Preparation of an application for an invention, utility model and industrial design. Examination of the application. Grant of a patent or certificate. The validity of patents and copyright certificates issued before the introduction of modern patent legislation. The rights of the authors of inventions, utility models and industrial designs. Patent rights and their protection. Content of patent rights. Duties of the patent owner.</p>
11	Learning outcomes	Be able to connect electric machines to the electrical network, conduct tests of electric machines and electric drives, calculate the working and mechanical characteristics of electric machines, choose the type and power of electric motors for various operating modes, perform the calculation of electromechanical transients of electric drives

1	Name of course	Basics of organization of wheeled and caterpillar machines
2	Code of course	OUKGM 1213
3	Cycle of course	BD
4	Amount of credits	4
5	Level of preparation	Undergraduate studies
6	Department	Agricultural machinery and technology
7	Year	1
8	Prerequisites	Physics, mathematics
9	Postrequisites	Mechanization of animal husbandry, Agricultural machinery
10	Course summary	Classification of tractors and automobiles, tillage machines and implements. The structure of wheeled and tracked vehicles and agricultural machinery, the requirements for tillage tools and machines, the purpose of tillage tools and agricultural machines. Agrotechnical requirements for tillage, sowing, care and harvesting of agricultural crops. Technology of feed preparation and requirements for their quality. Methods of harvesting herbs for hay. Manual equipment and the first units for mechanization of work on forage harvesting. Development of machines for mowing plants. Devices and mechanisms for further work on hay harvesting: - rakes; pickers; sledges; haystacks. Machines for harvesting pressed hay
11	Learning outcomes	Be able to apply in professional activity means of mechanization, electrification and automation of agriculture and technologies of use of electric energy in agriculture