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S. Seifullin Kazakh Agrotechnical University
Dean of the Faculty of Engineering
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CATALOG OF ELECTIVE DISCIPLINES

For students in the direction of preparation 6B071 Engineering and engineering trades

Brief description of the elective disciplines of the educational program

EPG	EP	Form of education	The name of discipline	Code of subject	Discipline cycle	Component	Number of credits	Level of training	Cafedra	Course	Academic period	Pre-requisitions	Post-requisitions	Brief content of the discipline	Key learning outcomes	Name of the alternative discipline
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Basics of organization of wheeled and caterpillar machines	OUKGM 1219	BS	Elective subjects	4.0	Bachelor	Mechanization of technological processes	1	2	Mathematics, Physics	Agrecultural machines, Mechanization of cattle-breeding farm	General information about the design, arrangement and operation of units and systems of basic models, basic adjustments, techniques for maintaining technical condition, expanding practical skills and abilities in the field of technical operation of domestic and foreign tractors and agricultural vehicles widely used in farms.	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Fundamentals of technology processing industries
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Fundamentals of technology processing industries	OTPP 1249	BS	Elective subjects	4.0	Bachelor	Agricultural and grain processing machines	1	2	Mathematics, Physics	Calculation and design of food production machines, Technological processes and apparatus of food production	The organization of the process flow as a system of processes. The structure of the process flow. Raw materials for food production. Formation of the nutritional value of the grain during cultivation. Change in grain quality during storage. Storage of raw materials and its preparation for production. The main processes of food technology, their role and impact on food quality	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of organization of wheeled and caterpillar machines

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Chemistry	Him 2208	BS	Elective subjects	4.0	Bachelor	Физики и химии	2	1	School chemistry course	Cutting theory, cutting tools and tooling, Metal-working machines and welding equipment, Thermal Engineering and Thermodynamics Basics	Formation of students' system of fundamental knowledge of the basic laws of chemistry and physico-chemical methods of analysis with their subsequent application of professional activity and use for solving engineering problems. The study of the basic laws of chemistry, chemical reactions, the peculiarities of their course, control methods, the theory of the structure of organic compounds, the classification of reagents and reactions in organic chemistry.	Apply modern methods of chemistry, physics, mathematics to solve problems that arise in the study of basic and major disciplines	Physical and colloid chemistry
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Physical and colloid chemistry	FKH 2248	BS	Elective subjects	4.0	Bachelor	Физики и химии	2	1	School chemistry course	Cutting theory, cutting tools and tooling, Mechanics of liquid and gas, Mechanics of materials	Molecular-kinetic theory of aggregative states of matter. Fundamentals of Chemical Thermodynamics (TD). Chemical kinetics. Catalysis. Chemical equilibrium. Phase balance. Solutions. Electrochemistry. Colloidal chemistry - physical chemistry of dispersed systems. Solutions of high-molecular compounds (IUD).	Apply modern methods of chemistry, physics, mathematics to solve problems that arise in the study of basic and major disciplines	Chemistry
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Electric machines and drives	EMP 2246	BS	Elective subjects	5.0	Bachelor	Exploitation electro-equipment	2	3	Electrical engineering and the basics of electronics, Mathematics, Physics	CNC system (Fundamentals of Mechatronics)	Types of electromechanical energy converters; design features of electric drives; operating modes, methods of selecting electric motors; drive characteristics, operating modes of electric drives of basic agricultural machinery and equipment; physical fundamentals of electric drives, selection and calculation of mechanical characteristics and transients in electric drives.	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements. To study the basic concepts of the laws of engineering mechanics, mechanics of materials, robotics and safety measures. To organize the production process, operation of MTP and maintenance of modern agricultural machinery with the introduction of	Automatic electric driver

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Automatic electric driver	AE 2250	BS	Elective subjects	5.0	Bachelor	Exploitation electro-equipment	2	3	Electrical engineering and the basics of electronics, Mathematics, Physics	CNC system (Fundamentals of Mechatronics)	Concept and definitions. Functions and requirements. Mechanical characteristics of industrial mechanisms. DC motors, asynchronous motors. The equation of motion of the electric drive. Bringing moments and effort. Transients in electric drives. Regulation of speed of electric drives.	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Electric machines and drives
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Pneumatic and hydraulic drives	PGP 3324	AS	Elective subjects	4.0	Bachelor	Mechanization of technological processes	3	1	Basics of organization of wheeled and caterpillar machines, Engineering mechanics	Agreecultural machines, CNC system (Fundamentals of Mechatronics), Manipulators and robots, Mechanization of cattle-breeding farm, Metal-working machines and welding equipment	Possess the skills of calculating the basic parameters of vane and volumetric pumps, hydrodynamic gears, volumetric hydraulic and pneumatic drives used in transport and transport-technological machines; application of methods and means of measuring the characteristics of fluid and air flows. Study of technological equipment using hydraulic and pneumatic drives, classification of hydropneumatic machines and drives, features of hydraulic and pneumatic systems.	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Mechanics of liquid and gas
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Mechanics of liquid and gas	MZhG 3328	AS	Elective subjects	4.0	Bachelor	Теплоэнергетика	3	1	Engineering mechanics, Mathematics, Physical and colloid chemistry, Physics	Calculation and design of food production machines, Manipulators and robots	Studying the basics of hydrostatics, kinematics, hydrodynamics, gas statics and gas dynamics, familiarization with the basic properties of liquids and gases; get an idea of the patterns of equilibrium and movement of liquids and gases; to master methods for calculating and analyzing flow processes, designing hydraulic and gas systems, developing skills in engineering calculations and mastering the methodology for solving the main problems of fluid and gas mechanics. The objectives of the course of studying the discipline include the mastery of theoretical knowledge and practical skills (skills) by students, the study of the basic physical properties of liquids and gases, the laws of equilibrium and movement of liquids and gases and the boundaries of their application, the study of methods for calculating liquid and gas	To teach the basic concepts and laws of engineering mechanics, mechanics of materials, to prepare for the design and construction of typical machine elements	Pneumatic and hydraulic drives

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Thermal Engineering and Thermodynamics Basics	TOT 3325	AS	Elective subjects	3.0	Bachelor	Теплоэнергетика	3	1	Engineering mechanics, Mathematics, Metalworking Modeling, Physics	Cutting theory, cutting tools and tooling, Metalworking machines and welding equipment	Formation of knowledge of the laws of obtaining and converting energy, methods for analyzing the efficiency of the use of heat, the ability to experimentally determine the characteristics of thermal heat and power equipment; conversion, transfer and use of heat, to such an extent that they can select	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Thermal and refrigerating equipment of food production
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Thermal and refrigerating equipment of food production	ТНОПП 3327	AS	Elective subjects	3.0	Bachelor	Теплоэнергетика	3	1	Engineering mechanics, Mathematics, Physics	Calculation and design of food production machines, Technological processes and apparatus of food production	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.	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Thermal Engineering and Thermodynamics Basics
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Mechanization of cattle-breeding farm	MZh 3214	BS	Elective subjects	5.0	Bachelor	Mechanization of technological processes	3	2	Computer-Aided Mechanism Design, Electric machines and drives, Pneumatic and hydraulic drives	Agrecultural machines, Mechanical and design assembly room	Training students to knowledge, abilities and practical skills on technology and mechanization of production processes in animal husbandry. Modern progressive methods and techniques of mechanization of production processes in animal husbandry, selection of machinery and equipment for the production of livestock products, rational use of material and energy-saving technical means. Designing and completing units of production technological lines of livestock farms, complexes.	Choose the best options for setting up and adjusting, maintaining and repairing machine tools, manipulators, robots, welding equipment and technological machines. Diagnose and establish the causes of malfunctions, study materials science, the basics of the theory of wear of parts, repair technology, plan and carry out installation, testing and operation	Machines and Apparatus for Processing Livestock Products

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Machines and Apparatus for Processing Livestock Products	MAPPZh 3251	BS	Elective subjects	5.0	Bachelor	Technological machines and equipment	3	2	Fundamentals of technology processing industries, Thermal and refrigerating equipment of food production	Calculation and design of food production machines, Machines and equipment for processing of crop products	Technological equipment for the preparation and processing of agricultural products by separation methods. Technological equipment for the preparation and processing of agricultural products by the methods of connection. Technological equipment for the preparation and processing of agricultural products by molding. Technological equipment for the preparation and processing of agricultural products by the methods of heat and mass transfer. Equipment for filling large-sized and small-sized containers, packaging machines. Line mechanized processing plants	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Mechanization of cattle-breeding farm
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Labor protection and basics of life safety	OTOBZh 3118	GER	Elective subjects	5.0	Bachelor	Mechanization of technological processes	3	2	Internship, Practical training, School course Fundamentals of life safety	Calculation and design of food production machines, Installation, testing and operation of technological machines, Internship, Mechanical and design assembly room	The discipline contributes to the formation of students' knowledge, practical skills to create safe and harmless living conditions, to prevent the causes and prevention of dangerous situations, to protect the population and production personnel and objects of the national economy from the possible consequences of emergency situations. It also studies the peculiarities of labor protection for women and youth, supervision and control of the implementation of labor protection legislation and responsibility for violation of labor protection requirements.	Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Basics of anti- corruption culture, Basics of economics and law, Innovative entrepreneurship, Introduction to leadership in education

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Basics of economics and law	OEP 3124	GER	Elective subjects	5.0	Bachelor	Economy	3	2	School courses Mathematics, Fundamentals of Law, Fundamentals of Entrepreneurship and Business	Calculation and design of food production machines, Mechanical and design assembly room, Production management	The discipline promotes knowledge of the subject of economic theory and methods of research, the basis of public economy, the mechanism of functioning of the market system, production, costs and income of the firm, national economy. Give an assessment of economic growth and instability of the market economy, inflation and unemployment as manifestations of economic instability. Demonstrate knowledge and skills in the financial and monetary credit system in the national economy and economic security. To master the basics of the theory of the state and law, the basics of constitutional, administrative, civil, labor, family, criminal law.	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of anti-corruption culture, Innovative entrepreneurship, Introduction to leadership in education, Labor protection and basics of life safety
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Introduction to leadership in education	VLO 3125	GER	Elective subjects	5.0	Bachelor	Профессиональное образование	3	2	Higher School Pedagogy, Management Psychology	Production management	The discipline analyzes and studies the model of effective communication of the leader, methods of management in critical situations, methods of work in the management team and the principle of distribution of roles in the team, methods of effective control and motivation of training. It provides an opportunity to study the theory of leadership qualities and at the same time the concept of leadership behavior (three leadership styles (K. Levin), research at the University of Ohio, research at the University of Michigan, management system (R. Likert), management grid (Blake and Mouton), concept of reward and punishment, substitute leadership (S. Kerr and J. Gernier).	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Basics of anti-corruption culture, Basics of economics and law, Innovative entrepreneurship, Labor protection and basics of life safety

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Basics of anti-corruption culture	OAK 3126	GER	Elective subjects	5.0	Bachelor	Economy	3	2	School courses Fundamentals of Law, Fundamentals of Entrepreneurship and Business	Production management	The discipline examines the theoretical and methodological foundations of the concept of "corruption" and examines the improvement of socio-economic relations of the Kazakh society as a condition for combating corruption, psychological features of the nature of corrupt behavior, formation of anti-corruption culture, features of formation of anti-corruption culture of youth, ethnic features of formation of anti-corruption culture, moral and ethical responsibility for corruption in various spheres. Discipline allows you to learn about legal responsibility for corruption offenses	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of economics and law, Innovative entrepreneurship, Introduction to leadership in education, Labor protection and basics of life safety
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Innovative entrepreneurship	IP 3127	GER	Elective subjects	5.0	Bachelor	Economy	3	2	School courses Fundamentals of Law, Fundamentals of Entrepreneurship and Business	Basics of patenting and professional creative, Calculation and design of food production machines, Mechanical and design assembly room, Production management	Form students' knowledge of the fundamental concepts of innovative development, modern approaches to the implementation of entrepreneurial activity in the field of new technologies to ensure the competitiveness of an innovative enterprise on the market. Understand the economic essence of innovative entrepreneurship, business planning, venture financing and know the types of firms with venture capital. Possess skills in risk management, human resource management, innovative management and innovative processes, as a condition for economic growth	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of anti-corruption culture, Basics of economics and law, Introduction to leadership in education, Labor protection and basics of life safety
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Technology of agricultural engineering	TSM 3326	AS	Elective subjects	5.0	Bachelor	Technological machines and equipment	3	2	Design of machine fixtures, Measuring Systems, Metalworking Modeling	CNC system (Fundamentals of Mechatronics), Cutting theory, cutting tools and tooling, Manipulators and robots, Mechanical and design assembly room, Metalworking machines and welding equipment	To form general professional knowledge and skills in the field of design of technological processes; their equipment for the production of agricultural machinery and apparatus and their technical operation, to acquaint future graduates with the methods of technical calculations and the development of product designs in relation to progressive technologies for single, serial and mass production.	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Technological processes and apparatus of food production

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Technological processes and apparatus of food production	TPAPP 3329	AS	Elective subjects	5.0	Bachelor	Technological machines and equipment	3	2	Fundamentals of technology processing industries, Materials in engineering design, Thermal and refrigerating equipment of food production	Calculation and design of food production machines, Installation, testing and operation of technological machines, Machines and equipment for processing of crop products	Formation of students' knowledge about technological processes and apparatuses of food production, as a set of scientific and engineering knowledge, which allows you to create new and improve existing technologies and equipment for food production. General patterns of technological processes; modeling of processes and devices; bases of rational construction of devices; grinding of solid materials; pressing, mixing, sorting processes; hydromechanical processes; membrane methods for separating liquid systems; essence of thermal processes; the main types of heat exchangers used in public catering; evaporation; condensation; theoretical foundations of mass transfer processes; sorption processes; drying; rectification; extraction; dissolution and crystallization	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Technology of agricultural engineering
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Agreecultural machines	SM 3217	BS	Elective subjects	5.0	Bachelor	Mechanization of technological processes	3	3	Basics of organization of wheeled and caterpillar machines, Internship, Mechanization of cattle-breeding farm, Technology of agricultural engineering	Installation, testing and operation of technological machines, Internship, Manipulators and robots	Possession of knowledge on the device of agricultural machines and their adjustment to the specified working conditions, the basic principles and laws of interaction of the working bodies of machines with the processed material, skills in assessing the quality of technological operations, methods and means of quality control of agricultural machines, skills in using technical means for electrification and automation of technological processes.	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Machines and equipment for processing of crop products
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Machines and equipment for processing of crop products	MAPPR 3252	BS	Elective subjects	5.0	Bachelor	Technological machines and equipment	3	3	Fundamentals of technology processing industries, Internship, Machines and Apparatus for Processing Livestock Products, Thermal and refrigerating equipment of food production	Calculation and design of food production machines, Installation, testing and operation of technological machines, Internship	Machines, technologies, units, complexes of primary grain processing. Machines, Purpose, device, technology, equipment and complexes of primary processing of potatoes. Machines, technologies, equipment and complexes of primary processing of root crops. Machines, technologies, equipment and complexes of primary processing of fruits and vegetables	To organize highly efficient operation of machines, apparatus, machinery and technological equipment in production, to show leadership qualities	Agreecultural machines

B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Mechanical and design assembly room	PMSC 4215	BS	Elective subjects	5.0	Bachelor	Technological machines and equipment	4	2	Computer-Aided Mechanism Design, Draft execution automation., Failure analysis and repair of machines, Installation, testing and operation of technological machines, Technology of agricultural engineering	Basics of patenting and professional creative, Production management	Machines, technologies, units, complexes of primary grain processing. Machines, Purpose, device, technology, equipment and complexes of primary processing of potatoes. Machines, technologies, equipment and complexes of primary processing of root crops. Machines, technologies, equipment and complexes of primary processing of fruits and vegetables	To study the hardware and software of engineering and computer graphics and to establish the capabilities of computer-aided design of mechanisms and metalworking simulation	Calculation and design of food production machines
B064 - «Mechanics and metal working»	6B07104 - «Technological Machinery and Equipment»	Full-time (bachelor 4 years) trimester	Calculation and design of food production machines	RPMPP 4253	BS	Elective subjects	5.0	Bachelor	Technological machines and equipment	4	2	Fundamentals of technology processing industries, Installation, testing and operation of technological machines, Technological processes and apparatus of food production, Thermal and refrigerating equipment of food production	Basics of patenting and professional creative, Production management	characterize the principles, methods, techniques and rules of design and construction, as well as forming ideas about design objects, their properties and indicators, are generally accepted in engineering practice. The quality of the designed machine is evaluated by a number of theoretically justified quantitative indicators, the main of which are economic (machine utilization rate, profitability, economic effect, etc.) and design perfection (coefficients of unification, standardization, normalization levels, etc.). No less important are the principles and methods of designing machines that do not have a quantitative assessment: the formation of derivative machines based on the original model, the reduction of the nomenclature due to the rational choice of type and the inclusion of development reserves and other methods in the design.	To study the hardware and software of engineering and computer graphics and to establish the capabilities of computer-aided design of mechanisms and metalworking simulation	Mechanical and design assembly room

The catalog of elective subjects was approved by the Academic Quality Council of the Technical Faculty, Protocol No. 10(E) dated June 29, 2022

Head of the Department of Technological Machines and Equipment



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