Ministry of Agriculture of the Republic of Kazakhstan
S.Seifullin Kazakh AgroTechnical university

Considered
at the meeting of the Academic
Council of the University
Protocol No. 19
from "31" 08 2022 y.

I APPROVE
Chairman of the Management Board
NAO "Kazakh Agrotechnical
University named after S.Seifullin"
"05" 09 2022 y.

EDUCATIONAL PROGRAM
6B07104 Technological Machinery and Equipment

Field of education: 6B07 Engineering, manufacturing and construction industries
Direction of personnel training: 6B071 Engineering and engineering trades
Code in the International Standard Classification of Education: 0710
Degree/qualification awarded: Bachelor of Engineering and Technology in the educational program 6B07104-Technological machines and equipment

Duration of study: 4 years

Nur-Sultan 2022

The author's team:

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The team of authors was approved by the order of the NAO "KATU named after S.Seifullin" No. 932-N dated 12.12.2018 (amended by Order No. 515-N dated 04.10.2022)

The educational program 6B07104-Technological machines and equipment
was considered at the meeting of the Department of Technological Machines and Equipment
Protocol No. 20 of June 27, 2022,

approved by the Academic Council of the Faculty for Quality
Protocol No. 10 (E) dated June 29, 2022.

1 Passport of the educational program

1.1 EP purpose**:** Directed comprehensive and high-quality training of competitive, highly qualified specialists, ready to solve practical and theoretical problems of professional activity in modern conditions of digitalization and technological re-equipment of existing sectors of the economy based on the development of skills and abilities necessary for the future specialist.

1.2 Educational outcome

EO 1. Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of the created products on the principles of engineering activity, formulate inventions, study innovative entrepreneurship and anti-corruption culture.

EO 2. Apply modern methods of chemistry, physics, mathematics to solve problems that arise in the study of basic and major disciplines

EO 3. To organize highly efficient operation of machines, devices, machinery and technological equipment in production, show leadership qualities.

EO 4. 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

EO 5. To teach the basic concepts and laws of engineering mechanics, mechanics of materials, to prepare for the design and construction of typical machine elements

EO 6. Make calculations in heat engineering, thermodynamics and electrical engineering; choose the correct operation of electrical and thermal equipment, analyze dangerous and harmful factors of production, study ecology and life safety requirements.

EO 7. Organize control parameters of electrical, hydraulic and pneumatic machines, metalworking machines, refrigeration equipment, drives and numerical control systems

EO 8. Choose the best options for setting up and adjusting, maintaining and repairing machine tools, manipulators, robots, welding equipment and technological machines

EO 9. Develop and describe projects for a mechanical engineering enterprise, develop a technological process for manufacturing parts, analyze regulatory and technical documentation and measuring systems

EO 10. 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

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

The relevance of the educational program. The needs of the labor market in the conditions of industrialization of production and digitalization of economic sectors within the framework of the State Program "Digital Kazakhstan" form new requirements in the direction of diversification and improvement of the quality of training of specialists. In this regard, the implementation of the program is aimed at the development of research and fundamental components in the preparation of bachelors of engineering and technology.

Features of the educational program. The educational program will meet the needs of the digital economy with an emphasis, first of all, on skills in information analysis and the development of creative thinking. Digitalization programs of industries will also be updated, taking into account the inclusion of STEM elements (robotics, CNC machines, virtual reality, 3D printing and others).

Competitive advantages

On the basis of KATU, the professional infrastructure (educational resources) necessary for the implementation of the OP has been created:

- on the recommendation of leading scientists of the University of California at Davis, an agroengineering Platform was created, which includes a "Production and experimental workshop for metalworking and welding" and a "Design Bureau", which are equipped with modern CNC machines;
- Kazakh-Chinese Agricultural Mechanization Center;
- laboratories: "Applied Robotics", "Mechatronics", "Installation and operation of technological machines", "Repair of technological machines", "Materials Science and technology of structural materials";
- circles: "Mechanical engineering and robotics", "Innovator", "Materaltanu, technologiyalar zhane marketing".

The uniqueness of the educational program. A unique program combining classical technical education with innovations in the field of training modern specialists. The program provides for the application of elements of Industry 4.0 for the implementation of measures for the technological re-equipment of basic branches of the agricultural sector, includes the use of innovative educational technologies, methods and methods of education, contains relevant disciplines reflecting the latest trends in the mechanical engineering market and employers' requests.

The main stakeholders of the educational program are:

- Teaching staff, students, parents, persons equated to them and relatives of students;
- Ministry of Agriculture of the Republic of Kazakhstan – NAO "National Agrarian Scientific and Educational Center";
- OUL "Union of Machine Builders of Kazakhstan";
- Enterprises of machine-building and agricultural industry;
- Research institutes and research and production centers.

3 Competence model (portrait) graduate

3.1 Areas of professional activity: technological machines and equipment; power equipment; running equipment; working equipment; machine drive systems; motion control systems; operator life support systems; general housing for the placement of all parts of the machine; structural and operational materials; equipment for the manufacture, testing and disposal of technological machines; equipment for maintenance and repair technological machines; control and measuring devices for the manufacture and operation of machines; equipment for automating the working processes of machines; equipment for designing machines.

3.2 Types of professional activity: calculation and design: collection and analysis of information source data for design; calculation and design of parts and assemblies in accordance with the terms of reference using modern design automation tools; development of design and working documentation, registration of completed design works; production and technological: organization of workplaces, their technical equipment, placement of technological equipment; control over compliance with technological discipline; maintenance of technological equipment; organization of metrological support of technological processes, use of standard methods of quality control of manufactured products; participation in the work on fine-tuning and mastering of technological processes during the preparation of production of new products.

3.3 General education competencies: aimed at forming the ideological, civil and moral positions of the future specialist, competitive on the basis of knowledge of information and communication technologies, building communication programs in Kazakh, Russian and foreign languages, orientation to a healthy lifestyle, self-improvement and professional success; form a system of general competencies that ensure the socio-cultural development of the personality of the future specialist based on the formation of his ideological, civil and moral positions; develop the ability to interpersonal social and professional communication in Kazakh, Russian and foreign languages; contribute to the development of information literacy through the mastery and use of modern information and communication technologies in all spheres of their lives and activities; form skills of self-development and education throughout life; form a personality capable of mobility in the modern world, critical thinking and physical self-improvement; formation of students' competencies in the field of economics and law, the basics of anti-corruption culture, ecology and life safety, as well as entrepreneurship skills, research methods.

3.4 Basic competencies: providing in-depth knowledge of natural science, general technical and economic nature as the foundation of professional education; basic understanding of the scientific picture of the world with an understanding of the essence of the basic laws of science; understanding of basic hypotheses, laws, methods, formulation of conclusions and evaluation of errors.

Based on the requirements for the level of training of students, they must:

- demonstrate knowledge and understanding in the field being studied, based on advanced knowledge in the field being studied;
- apply knowledge and understanding at a professional level, formulate arguments and solve problems of the studied area;
- to collect and interpret information for the formation of judgments taking into account social, ethical and scientific considerations;
- apply theoretical and practical knowledge to solve educational, practical and professional tasks in the studied area;
- learning skills necessary for independent continuation of further education in the field of study;
- know the methods of scientific research and academic writing and apply them in the field of study;
- apply knowledge and understanding of facts, phenomena, theories and complex dependencies between them in the field under study;
- understand the importance of the principles and culture of academic integrity**.**

3.5 Professional competencies: providing in-depth theoretical knowledge and practical experience in the field of technological machines and equipment; carrying out work on the preparation of technical documentation and established reporting on approved forms; conducting training and instruction on safety, labor protection and the environment; monitoring compliance with requirements for the preparation of documentation on quality management of technological processes at production sites; improvement of the design of technological machines and equipment using breakthrough technologies and capabilities; complex mechanization and automation of technological processes; establishment and maintenance of optimal operating modes of technological machines and equipment.

4 The basis for passing professional practices Educational practice is carried out in the educational and training workshops of the university, in the metalworking and welding Shop and the corresponding laboratories of the department.

The bases for the passage of industrial and pre-graduate practices of students are organizations, enterprises of the agro-industrial complex, industrial and social spheres, divisions of the management system of state-owned enterprises, joint-stock companies and private firms. Practical training is also conducted at scientific and production associations, scientific, design and design organizations, repair, machine-building plants, agricultural repair enterprises, etc.

The main bases of professional practice in the educational program are: Agropromzapchatservice LLP, Spare Part Railway LLP, MVTU LLP, Akkol branch of Agroengineering Research and Production Center LLP, Agrotechns LLP, Transport Engineering Design Bureau LLP, EuraziaGroupKazakhstan LLP, Galam LLP.

5 Structure of the Bachelor's degree program

№	Name of cycles and disciplines	Total labor intensity	
		in academic hours	in academic credits
1	2	3	4
1	**Cycle of general education disciplines (GED)**	**1680**	**56**
	Required component	**1530**	**51**
	History of Kazakhstan	150	5
	Philosophy	150	5
	Foreign language	300	10
1)	Kazakh (Russian) language	300	10
	Information and Communication Technologies (in English)	150	5
	Module of socio-political knowledge (Cultural Studies and Psychology)	120	4
	Module of socio-political knowledge (Political Science and Sociology)	120	4
	Physical Culture	240	8
2)	**Component of choice**	**150**	**5**
	Basics of Economics and Law	150	5
	Labor protection and the basics of life safety		
	Introduction to Leadership in Education		
	Innovative entrepreneurship		
	Basics of anti-corruption culture		
2	**Cycle of basic disciplines (DB)**	**3360**	**112**
1)	**University component**	**2520**	**84**
	Mathematics	270	9
	Physics	210	7
	Descriptive geometry and engineering graphics	180	6
	Engineering mechanics	120	4
	Electrical engineering and the basics of electronics	150	5
	Mechanics of materials	120	4
	Measuring systems	150	5
	Materials in engineering design	120	4
	Metalworking machines and welding equipment	210	7

	CNC system (Fundamentals of Mechatronics)	150	5
	Manipulators and robots	150	5
	Metalworking modeling	150	5
	Draft execution automation	120	4
	Automated design of mechanisms	150	5
	Basics of Design	150	5
	Basics of patenting and professional creativity	120	4
2)	**Component of choice**	**840**	**28**
	Chemistry	120	4
	Physical and colloidal chemistry		
	Basics of wheeled and caterpiller vehicles	120	4
	Fundamentals of technology of processing industries		
	Automatic electric drive	150	5
	Electric machines and drives		
	Mechanization of cattle-breeding farm	150	5
	Machines and apparatus for processing livestock products		
	Agricultural machines	150	5
	Machines and equipment for processing of crop products		
	Mechanical and design assembly rooms	150	5
	Calculation and design of food production machines		
3	**Cycle of profile disciplines (PD)**	**1800**	**60**
1)	University component	**1440**	**48**
	Design of machine fixtures	120	4
	Educational practice	60	2
	Production practice	510	17
	Production processes (MAC, KTOP)	150	5
	Cutting theory, cutting tools and tooling	120	4
	Failure analysis and repair of machines	150	5
	Installation, testing and operation of technological machines	210	7
	Production management	120	4
2)	**Component of choice**	**360**	**12**
	Fluid and gas mechanics	120	4

	Pneumatic and hydraulic drives		
	Thermal and refrigerating equipment of food production	90	3
	Thermal engineering and thermodynamics Basics		
	Technological processes and apparatus of food production	150	5
	Technology of Agricultural engineering		
4	**Additional types of training (ATT)**		
1)	Elective component (military training and		
	other types of educational activities determined by the student independently)		
5	**Final certification**	**360**	**12**
1)	Writing and defending a thesis (project) or preparing and passing a comprehensive exam	360	12
	Total	**7200**	**240**

Annex 1. Academic calendar

Approved
Deputy Chairman of the Board for
Academic Affairs - Rector
_____ A.Abdyrov
"___" _____ 2022

ACADEMIC CALENDAR
for 2022-2023 academic year
in areas of Bachelor degree training

Beginning of 1st trimester		**1 September**
1	Presentation week	from 1 September to September 2 **(from August 29 to September 2 for 1 course)**
2	***Constitution day***	***30 August***
3	***The day of knowledge***	***1 September***
4	Examination session	from 14 to 25 November
5	***The day of the First President***	***of 1 December***
6	FX delivery	from 14 November to 9 December
7	***Independence day***	***16 December***
8	Holidays	from 28 November to 31 December
9	***The New year's holiday***	***January 1,2,3***
Beginning of 2nd trimester		**1 January**
10	***Christmas***	***7 January***
11	***International Women's Day***	***on 8 March***
12	***Nauryz holiday***	***21,22,23 March***
13	Examination session	from March 13 to 24 March
14	FX delivery	from March 13 to 31 March
15	Holidays	from March 27 to March 31
Beginning of 3rd trimester		***1 April***
16	***Holiday of Unity of Nations of Kazakhstan***	***1 May***
17	***Defender is day***	***7 may***
18	***Victory Day***	***9 may***
19	Examination session	from 12 June to 23 June
20	Holidays	from 26 June to 31 August
21	FX delivery	from 12 June to 30 June
22	Enrollment for a trimester	from 26 June to 30 June
23	Final examination	until June 30
24	Summer trimester	from 3 June to 11 August
25	***Capital Day***	***6 July***

Note: If it concurs with a weekend or a holiday, study begins on the next working day.

Deputy Director of the Department
of Academic Affairs _____ A.Sh.Imasheva

График учебного процесса на 2022-2023 учебный год для образовательных программ и специальностей бакалавриата технического факультета

Курс	Сентябрь					Октябрь				Ноябрь					Декабрь				Январь					Февраль				Март				Апрель				Май					Июнь				Июль				Август			
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	*33*	*34*	*35*	*36*	*37*	*38*	*39*	*40*	*41*	*42*	*43*	*44*	*45*	*46*	*47*	*48*	*49*	*50*	*51*	*52*
	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21
	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*								*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*				*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*											
6B07104 "Технологические машины и оборудование" / 6B07105 "Механическая инженерия"																																																				
I	ПН	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	К/ ЗС	К	К	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	·/Уп	С/ ЗС	С/ ЗС	ЗС/ЗЛ/ Уп/К	Л/К	Л/К	Л/К	Л/К	Л/К	Л/К	К	К
II	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	К/ ЗС	К	К	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	С/ ЗС	С/ ЗС	ЗС / ЗЛ/К	Л/К	Л/К	Л/К	Л/К	Л/К	Л/К	К	К
III	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	К/ ЗС	К	К	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	С/ ЗС	С/ЗС /ВС	ЗС/ЗЛ К/ВС	К/Л /ВС	К/Л /ВС	К/Л /ВС	К/Л /ВС	Л/К	Л/К	К	К
IV	К	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	·/Пр	С/ ЗС	С/ ЗС	К/ ЗС	К/ ЗС	К	К	К	.	.	.	.	.	.	.	.	.	.	С/ ЗС	С/ ЗС	К/ ЗС	·/Д	·/Д	·/Д	·/Д	·/Д	С/ЗС	Д/ЗС	Д	ИА	ИА	ИА	ИА	ИА								

ПН - презентационная неделя
. - теоретическое обучение
ЗС- сдача FX
С - сессия экзаменационная

Л - летний семестр
Уп - учебная практика
Пр - производственная практика
Пд - преддипломная практика
ЗЛ - запись на летний триместр

К - каникулы
ВС - военные сборы
Д -дипломное проектирование
ИА - Итоговая атестация

Праздничные дни:

30, 31 августа - День Конституции
1 сентября - День знаний
1 декабря - День Первого Президента
16, 17 декабря - День независимости
1, 2, 3, 4 января - Новогодние праздники
7 января - Рождество
8 марта - Международный женский день
21, 22, 23 марта - Наурыз мейрамы
1, 2 мая - Праздник единства народа Казахстана
7 мая - День защитника Отечества
9 мая - День Победы
6 июля - День Столицы

Всего недель:

теоретическое обучение - 30 недель
экзаменационная сессия -3-4 недели
каникулы зимние - 3 недели
каникулы весенние - 1 неделя
летний семестр - 6 недель

Annex 2. Working curriculum.

Admission year: 25-05-2023 to the EP 6B07104 Technological machines and equipment

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period							
												Classroom work					Independent work of students		1 course		2 course		3 course		4 course	
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8
																			Number of weeks in the academic period							
																			15	15	15	15	15	15	15	15
General modules																										
1	language	GER	CS	IYa 1103	Foreign language	3	by student's option	by student's option			3/0															
2		GER	CS	KRYa 1104	Kazakh (russian) language	3	by student's option	by student's option			3/0															
3		GER	CS	IYa 1101	Foreign language	4	1	1			4/0								4.0							
4		GER	CS	KRYa 1106	Kazakh (russian) language	4	1	1			4/0								4.0							
5		GER	CS	IYa 1102	Foreign language	3	2	2			3/0									3.0						
6		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/0									3.0						
7	social and political	GER	CS	KP 1110	Cultural studies and psychology	4	by student's option	by student's option			4/0															
8		GER	CS	PS 1109	Political science and sociology	4	2	2			4/0									4.0						
9		GER	CS	IK 1120	History of Kazakhstan	5	2	2			5/0									5.0						
10		GER	CS	Fil 2108	Philosophy	5	3	3			5/150	15		30			30	75			5.0					
11		GER	ES	OTOBZh 4301	The labour safety and safety of the life activity	5	6	6			5/150	15		30			30	75								
12		GER	ES	OEP 3125	Basics of economics and law			6			5/150	15		30			30	75								
13		GER	ES	VLO 3126	Introduction to leadership in education			6			5/150	15		30			30	75						5.0		
14		GER	ES	OAK 3127	Basics of anti-corruption culture			6			5/150	15		30			30	75								
15		GER	ES	IP 3123	Innovative entrepreneurship			6			5/150	15		30			30	75								
16	general education	GER	CS	IKT 1111	Information and communication technologies	5	by student's option	by student's option			5/0															
17		GER	CS	FK 1114	Physical education.	1	by student's option	by student's option			1/0															
18		GER	CS	FK 1112	Physical education.	2	1	1			2/0								2.0							
19		GER	CS	FK 1113	Physical education.	1	2	2			1/0									1.0						
20		GER	CS	FK 2115	Physical education.	2	3	3			2/60			60							2.0					
21		GER	CS	FK 2116	Physical education.	2	4	4			2/60			60								2.0				
Modules of specialty/education programm																										
22	base	BS	UC	NGIG 1208	Descriptive geometry and engineering graphics	3	by student's option	by student's option			3/0															
23		BS	UC	Mat 1202	Mathematics	5	1	1			5/0								5.0							
24		BS	UC	Fiz 1205	Physics	4	1	1			4/0								4.0							
25		BS	UC	IM 2217	Engineering mechanics	4	3	3			4/120	15	15.0	15			15	60			4.0					
26		BS	UC	Mat 2203	Mathematics	4	3	3			4/120	15		30			15	60			4.0					
27		BS	UC	Fiz 2206	Physics	3	3	3			3/90	15	15.0				15	45			3.0					
28		BS	UC	NGIG 2219	Descriptive geometry and engineering graphics	3	3	3			3/90		30.0				15	45			3.0					
29		BS	UC	EOE 2245	Electrical engineering and the basics of electronics	5	3	3			5/150	15	15.0	15			30	75			5.0					
30		BS	UC	MM 2201	Mechanics of materials	4	4	4			4/120	15	15.0	15			15	60				4.0				
31		BS	UC	IS 2222	Measuring Systems	5	4	4			5/150	15		30			30	75				5.0				
32		BS	ES	Him 2208	Chemistry	4	4	4			4/120	15	30.0				15	60				4.0				
33		BS	ES	FKH 2237	Physical and colloid chemistry			4			4/120	15	30.0				15	60								
34		BS	UC	MIP 3227	Materials in engineering design	4	5	5			4/120	15	30.0				15	60					4.0			
35	general technical	BS	ES	OUKGM 1219	Basics of organization of wheeled and casterpillar machines	4	2	2			4/0									4.0						
36		BS	ES		Fundamentals of technology processing industries			2			4/0															
37		BS	ES	EMP 2249	Electric machines and drives	5	4	4			5/150	15	15.0	15			30	75				5.0				
38		BS	ES	AE 2238	Automatic electric driver			4			5/150	15	15.0	15			30	75								
39		BS	UC	MR 3241	Manipulators and robots	5	5	5			5/150	15	30.0				30	75					5.0			
40		BS	ES	MAPPZh 3250	Machines and Apparatus for Processing Livestock Products	5	5	5			5/150	15		30			30	75					5.0			
41		BS	ES	MZh 3214	Mechanization of cattle-breeding farm			5			5/150	15	15.0	15			30	75								
42		BS	ES	MAPPR 3251	Machines and equipment for processing of crop products	5	6	6			5/150	15		30			30	75						5.0		
43		BS	ES	SM 3217	Agreecultural machines			6			5/150	15	15.0	15			30	75								

44		BS	UC	SChOM 4211	CNC system (Fundamentals of Mechatronics)	5	7	7			5/150	15	30.0				30	75							5.0	
45		BS	UC	MSSO 4242	Metal-working machines and welding equipment	7	7	7			7/210	30	30.0	15			30	105							7.0	
46		AS	ES	THOPP 3328	Thermal and refrigerating equipment of food production	3	5	5			3/90	15		15			15	45					3.0			
47		AS	ES	TOT 3325	Thermal Engineering and Thermodynamics Basics			5			3/90	15		15			15	45								
48		BS	UC	AVCh 2215	Draft execution automation.	4	3	3			4/120		30.0	15			15	60			4.0					
49		BS	UC	APM 2209	Computer-Aided Mechanism Design	5	4	4		4	5/150	15	15.0	15			30	75				5.0				
50		BS	UC	OK 3210	Basics of design	5	5	5		5	5/150	15	15.0	15			30	75					5.0			
51		BS	UC	MM 4231	Metalworking Modeling	5	7	7			5/150	15	30.0				30	75							5.0	
52	design and technolog	BS	UC	OPPT 4243	Basics of patenting and professional creative	4	8	8			4/120	15		30			15	60								4.0
53		BS	ES	RPMPP 4252	Calculation and design of food production machines	5	8	8		8	5/150	15		30			30	75								5.0
54		BS	ES	PMSC 4215	Mechanical and design assembly room			8		8	5/150	15		30			30	75								
55		AS	UC	PSP 3323	Design of machine fixtures	4	5	5		5	4/120	15	30.0				15	60					4.0			
56		AS	UC	PPMK 4307	Production processes (CAM, DTSP)	5	8	8			5/150	15	30.0				30	75								5.0
57		**AS**	**UC**	**UP 1316**	**Practical training**	**2**	**by student's option**				**2/60**					60										
58		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**4**				**5/150**					150					5.0				
59		AS	ES	PGP 3327	Pneumatic and hydraulic drives	4	5	5			4/120	15	15.0	15			15	60					4.0			
60		AS	ES	MZhG 3318	Mechanics of liquid and gas			5			4/120	15	15.0	15			15	60								
61		AS	UC	TRRIO 3305	Cutting theory, cutting tools and tooling	4	6	6			4/120	15	30.0				15	60						4.0		
62	profiling	AS	UC	AORM 3302	Failure analysis and repair of machines	5	6	6		6	5/150	15	30.0				30	75						5.0		
63		**AS**	**UC**	**PP 3304**	**Internship**	**6**	**6**				**6/180**					180							6.0		
64		AS	ES	TSM 3329	Technology of agricultural engineering	5	6	6		6	5/150	15	15.0	15			30	75						5.0		
65		AS	ES	TPAPP 3320	Technological processes and apparatus of food production			6		6	5/150	15	15.0	15			30	75								
66		AS	UC	MIETM 4301	Installation, testing and operation of technological machines	7	7	7			7/210	30	30.0	15			30	105							7.0	
67		**AS**	**UC**	**PP 4322**	**Internship**	**6**	**7**				**6/180**					180								6.0		
68	organizational-economic	AS	UC	PM 4321	Production management	4	8	8			4/120	15		30			15	60								4.0
Additional modules beyond qualification																											
Modules of choice																											
Scientifically research																											
Weekly average workload at hours																		38	40	60	60	60	60	60	36		
1	**General education subjects(GER)**					**56**		**17**	**0**	**0**	**420**	**30**	**0**	**180**	**0**	**0**	**60**	**150**	**10**	**16**	**7**	**2**	**0**	**5**	**0**	**0**		
	Core subjects(GER/CS)					51		16	0	0	270	15	0	150	0	0	30	75	10	16	7	2	0	0	0	0		
	University component(GER/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Electives(GER/ES)					5		1	0	0	150	15	0	30	0	0	30	75	0	0	0	0	0	5	0	0		
2	**Base requirements(BS)**					**112**		**25**	**0**	**3**	**2880**	**300**	**345**	**300**	**0**	**0**	**495**	**1440**	**9**	**4**	**23**	**23**	**19**	**5**	**17**	**9**		
	Core subjects(BS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	University component(BS/UC)					84		19	0	2	2160	225	300	195	0	0	360	1080	9	0	23	14	14	0	17	4		
	Electives(BS/ES)					28		6	0	1	720	75	45	105	0	0	135	360	0	4	0	9	5	5	0	5		
3	**Profession requirements(VRS)**					**60**		**9**	**0**	**3**	**1800**	**150**	**180**	**90**	**0**	**570**	**195**	**615**	**0**	**0**	**0**	**5**	**11**	**20**	**13**	**9**		
	Core subjects(VRS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	University component(VRS/UC)					48		6	0	2	1440	105	150	45	0	570	135	435	0	0	0	5	4	15	13	9		
	Electives(VRS/ES)					12		3	0	1	360	45	30	45	0	0	60	180	0	0	0	0	7	5	0	0		
4	**Disciplines for the formation of professional competencies(BDFPC)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
	Core subjects(BDFPC/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	University component(BDFPC/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Electives(BDFPC/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		
	Core subjects(BDPD/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	University component(BDPD/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Electives(BDPD/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total on curriculum						228			**0**	**6**	**5100**	**480**	**525**	**570**	**0**	**570**	**750**	2205	19	20	30	30	30	30	30	18		
6	**Additional courses**														**Number of credits**			**Semester**			**Number of hours**			**Number of weeks**				
7	**Module of final certification (MoFC)**														**12**						**360.0**							
Total including FCS															**240**						**7200.0**						

Admission year: 25-05-2022 to the EP 6B07104 Technological machines and equipment

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period											
												Classroom work					Independent work of students		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
																			Number of weeks in the academic period											
																			10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	language	GER	CS	IYa 1101	Foreign language	4	1	1			4/120			40			16	64	4.0											
2		GER	CS	KRYa 1106	Kazakh (russian) language	4	1	1			4/120			40			16	64	4.0											
3		GER	CS	IYa 1102	Foreign language	3	2	2			3/90			30			12	48		3.0										
4		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0										
5		GER	CS	IYa 1103	Foreign language	3	3	3			3/90			30			12	48			3.0									
6		GER	CS	KRYa 1104	Kazakh (russian) language	3	3	3			3/90			30			12	48			3.0									
7	general education	GER	CS	FK 1112	Physical education.	2	1	1			2/60			60					2.0											
8		GER	CS	FK 1113	Physical education.	1	2	2			1/30			30						1.0										
9		GER	CS	IKT 1111	Information and communication technologies	5	3	3			5/150	20	30.0				20	80			5.0									
10		GER	CS	FK 1114	Physical education.	1	3	3			1/30			30							1.0									
11		GER	CS	FK 2115	Physical education.	2	4	4			2/60			60								2.0								
12		GER	CS	FK 2116	Physical education.	1	5	5			1/30			30									1.0							
13		GER	CS	FK 2117	Physical education.	1	6	6			1/30			30										1.0						
14	social and political	GER	CS	PS 1109	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0										
15		GER	CS	IK 1120	History of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0										
16		GER	CS	KP 1110	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0									
17		GER	CS	Fil 2108	Philosophy	5	5	5			5/150	20		30			20	80					5.0							
18		GER	ES	VLO 3121	Introduction to leadership in education	5	8	8			5/150	20		30			20	80							5.0					
19		GER	ES	OAK 3122	Basics of anti-corruption culture	5	8	8			5/150	20		30			20	80							5.0					
20		GER	ES	IP 3123	Innovative entrepreneurship	5	8	8			5/150	20		30			20	80							5.0					
21		GER	ES	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80							5.0					
22		GER	ES	OEP 3119	Basics of economics and law	5	8	8			5/150	20		30			20	80							5.0					
Modules of specialty/education programm																														
23	base	BS	UC	Mat 1202	Mathematics	5	1	1			5/150	20		30			20	80	5.0											
24		BS	UC	Fiz 1205	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0											
25		BS	UC	NGIG 1208	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0									
26		BS	UC	Mat 2203	Mathematics	4	4	4			4/120	20		20			16	64				4.0								
27		BS	ES	Him 2208	Chemistry	4	4	4			4/120	20	20.0				16	64				4.0								
28		BS	UC	Fiz 2206	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0								
29		BS	UC	MIP 2227	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0								
30		BS	UC	NGIG 2219	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0								
31		BS	ES	FKH 2237	Physical and colloid chemistry	4	4	4			4/120	20	20.0				16	64				4.0								
32		BS	UC	IM 2217	Engineering mechanics	4	5	5			4/120	10	10.0	20			16	64					4.0							
33		BS	UC	EOE 2245	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0							
34		BS	UC	MM 2201	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0						
35		BS	UC	IS 2222	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0						
36	general technical	BS	ES	OUKGM 1219	Basics of organization of wheeled and casterpillar machines	4	2	2			4/120	20	20.0				16	64		4.0										
37		BS	ES	OTPP 1233	Fundamentals of technology processing industries	4	2	2			4/120	20	20.0				16	64		4.0										
38		BS	ES	AE 2238	Automatic electric driver	5	6	6			5/150	20	10.0	20			20	80						5.0						
39		BS	ES	EMP 2246	Electric machines and drives	5	6	6			5/150	20	10.0	20			20	80						5.0						
40		BS	ES	MZh 3214	Mechanization of cattle-breeding farm	5	8	8			5/150	20	10.0	20			20	80							5.0					
41		BS	ES	MAPPZh 3228	Machines and Apparatus for Processing Livestock Products	5	8	8			5/150	20	10.0	20			20	80							5.0					
42		BS	ES	SM 3217	Agreecultural machines	5	9	9			5/150	20	10.0	20			20	80								5.0				
43		BS	ES	MAPPR 3235	Machines and equipment for processing of crop products	5	9	9			5/150	20	10.0	20			20	80								5.0				
44		BS	UC	MSSO 4242	Metal-working machines and welding equipment	7	10	10			7/210	20	20.0	30			28	112									7.0			

45		BS	UC	SChOM 4211	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80										5.0	
46		BS	UC	MR 4241	Manipulators and robots	5	11	11			5/150	20	10.0	20			20	80										5.0	
47		AS	ES	THOPP 3319	Thermal and refrigerating equipment of food production	3	7	7			3/90	10		20			12	48						3.0					
48		AS	ES	TOT 3325	Thermal Engineering and Thermodynamics Basics	3	7	7			3/90	10		20			12	48						3.0					
49		BS	UC	MM 2231	Metalworking Modeling	5	5	5			5/150	20	10.0	20			20	80					5.0						
50		BS	UC	AVCh 3215	Draft execution automation.	4	7	7			4/120		20.0	20			16	64						4.0					
51		BS	UC	APM 3209	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80						5.0					
52		BS	UC	OK 3210	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80							5.0				
53	design and technolog	BS	ES	PMSC 4215	Mechanical and design assembly room	5	11	11			5/150	20		30			20	80										5.0	
54		BS	ES	RPMPP 4247	Calculation and design of food production machines	5	11	11			5/150	20		30			20	80										5.0	
55		BS	UC	OPPT 4243	Basics of patenting and professional creative	4	12	12			4/120	20		20			16	64											4.0
56		AS	UC	PSP 3323	Design of machine fixtures	4	7	7			4/120	20	10.0	10			16	64						4.0					
57		AS	UC	PPMK 4307	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80										5.0	
58		**AS**	**UC**	**UP 1316**	**Practical training**	**2**	**3**				**2/60**					60					2.0							
59		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150							5.0					
60		AS	ES	MZhG 3318	Mechanics of liquid and gas	4	7	7			4/120	20	10.0	10			16	64						4.0					
61		AS	ES	PGP 3324	Pneumatic and hydraulic drives	4	7	7			4/120	20	10.0	10			16	64						4.0					
62		AS	ES	TPAPP 3320	Technological processes and apparatus of food production	5	8	8			5/150	20	10.0	20			20	80							5.0				
63	profiling	AS	ES	TSM 3326	Technology of agricultural engineering	5	8	8			5/150	20	10.0	20			20	80							5.0				
64		AS	UC	TRRIO 3305	Cutting theory, cutting tools and tooling	4	9	9			4/120	10	10.0	20			16	64								4.0			
65		AS	UC	AORM 3302	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80								5.0			
66		**AS**	**UC**	**PP 3304**	**Internship**	**6**	**9**				**6/180**					180									6.0			
67		AS	UC	MIETM 4301	Installation, testing and operation of technological machines	7	10	10			7/210	20	20.0	30			28	112									7.0		
68		**AS**	**UC**	**PP 4322**	**Internship**	**6**	**10**				**6/180**					180										6.0		
69	organizational-economic	AS	UC	PM 4321	Production management	4	12	12			4/120	20		20			16	64											4.0
Additional modules beyond qualification																													
Modules of choice																													
Scientifically research																													
Weekly average workload at hours																57	72	63	72	60	75	81	150	75	60	75	24		
1	**General education subjects(GER)**	**76**		**22**	**0**	**0**	**2280**	**200**	**30**	**690**	**0**	**0**	**272**	**1088**	**10**	**16**	**16**	**2**	**6**	**1**	**0**	**25**	**0**	**0**	**0**	**0**				
	Core subjects(GER/CS)	51		17	0	0	1530	100	30	540	0	0	172	688	10	16	16	2	6	1	0	0	0	0	0	0				
	University component(GER/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(GER/ES)	25		5	0	0	750	100	0	150	0	0	100	400	0	0	0	0	0	0	0	25	0	0	0	0				
2	**Base requirements(BS)**	**140**		**31**	**0**	**2**	**4200**	**520**	**360**	**520**	**0**	**0**	**560**	**2240**	**9**	**8**	**3**	**22**	**14**	**19**	**9**	**15**	**10**	**7**	**20**	**4**				
	Core subjects(BS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BS/UC)	84		19	0	2	2520	280	220	340	0	0	336	1344	9	0	3	14	14	9	9	5	0	7	10	4				
	Electives(BS/ES)	56		12	0	0	1680	240	140	180	0	0	224	896	0	8	0	8	0	10	0	10	10	0	10	0				
3	**Profession requirements(VRS)**	**72**		**12**	**0**	**1**	**2160**	**210**	**100**	**220**	**0**	**570**	**212**	**848**	**0**	**0**	**2**	**0**	**0**	**5**	**18**	**10**	**15**	**13**	**5**	**4**				
	Core subjects(VRS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(VRS/UC)	48		6	0	1	1440	110	60	120	0	570	116	464	0	0	2	0	0	5	4	0	15	13	5	4				
	Electives(VRS/ES)	24		6	0	0	720	100	40	100	0	0	96	384	0	0	0	0	0	0	14	10	0	0	0	0				
4	**Disciplines for the formation of professional competencies(BDFPC)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDFPC/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDFPC/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDFPC/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDPD/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDPD/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDPD/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Total on curriculum		288			**0**	**3**	**8640**	**930**	**490**	**1430**	**0**	**570**	**1044**	4176	19	24	**21**	24	**20**	25	27	50	25	**20**	25	8				
6	**Additional courses**										**Number of credits**				**Semester**				**Number of hours**				**Number of weeks**						
7	**Module of final certification (MoFC)**										**12**								**360.0**										
Total including FCS											**300**								**9000.0**										

Admission year: 25-05-2021 to the EP 6B07104 Technological machines and equipment

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period											
												Classroom work					Independent work of students		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
								Number of weeks in the academic period											10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	linguistic	GER	CS	IYa 1101	Foreign language	4	1	1			4/120			40			16	64	4.0											
2		GER	CS	KRYa 1102	Kazakh (russian) language	4	1	1			4/120			40			16	64	4.0											
3		GER	CS	IYa 1104	Foreign language	3	2	2			3/90			30			12	48		3.0										
4		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0										
5		GER	CS	IYa 1109	Foreign language	3	3	3			3/90			30			12	48			3.0									
6		GER	CS	KRYa 1110	Kazakh (russian) language	3	3	3			3/90			30			12	48			3.0									
7	qwewr	GER	CS	FK 1103	Physical education.	2	1		1		2/60			60					2.0											
8		GER	CS	FK 1108	Physical education.	1	2		2		1/30			30						1.0										
9		GER	CS	IKT 1112	Information and communication technologies	5	3	3			5/150	20	30.0				20	80			5.0									
10		GER	CS	FK 1113	Physical education.	1	3		3		1/30			30							1.0									
11		GER	CS	FK 2114	Physical education.	2	4		4		2/60			60								2.0								
12		GER	CS	FK 2116	Physical education.	1	5		5		1/30			30									1.0							
13		GER	CS	FK 2117	Physical education.	1	6		6		1/30			30										1.0						
14		GER	UC	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80								5.0				
15	social and political	GER	CS	PS 1107	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0										
16		GER	CS	SIK 1106	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0										
17		GER	CS	KP 1111	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0									
18		GER	CS	Fil 2115	Philosophy	5	5	5			5/150	20		30			20	80					5.0							
Modules of specialty/education programm																														
19	Base	BS	UC	Mat 1201	Mathematics	5	1	1			5/150	20		30			20	80	5.0											
20		BS	UC	Fiz 1202	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0											
21		BS	UC	NGIG 1203	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0									
22		BS	UC	Mat 2204	Mathematics	4	4	4			4/120	20		20			16	64				4.0								
23		BS	ES	Him 2215	Chemistry	4	4	4			4/120	20	20.0				16	64				4.0								
24		BS	UC	Fiz 2205	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0								
25		BS	UC	NGIG 2206	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0								
26		BS	ES	MZh 3218	Mechanization of cattle-breeding farm	5	8	8			5/150	20	10.0	20			20	80								5.0				
27		BS	ES	SM 3219	Agreecultural machines	5	9	9			5/150	20	10.0	20			20	80									5.0			
28	General Technical	BS	ES	OUKGM 1214	Basics of organization of wheeled and casterpillar machines	4	2	2			4/120	20	20.0				16	64		4.0										
29		BS	UC	IM 2207	Engineering mechanics	4	5	5			4/120	10	10.0	20			16	64					4.0							
30		BS	ES	EOE 2216	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0							
31		BS	UC	MM 2208	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0						
32		BS	UC	IS 2209	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0						
33		BS	ES	EMP 2217	Electric machines and drives	5	6	6			5/150	20	10.0	20			20	80						5.0						
34		BS	UC	AVCh 3211	Draft execution automation.	4	7	7			4/120		20.0	20			16	64							4.0					
35		BS	ES	TOT 3223	Thermal Engineering and Thermodynamics Basics	3	7	7			3/90	10		20			12	48							3.0					
36		BS	ES	PK 3224	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64							4.0					
37		BS	ES	PGP 3225	Pneumatic and hydraulic drives	4	7	7			4/120	20	10.0	10			16	64							4.0					
38		BS	UC	SChOM 4213	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80											5.0	
39		AS	UC	MIP 2301	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0								
40		AS	UC	TRRIO 2302	Cutting theory, cutting tools and tooling	5	5	5			5/150	20	10.0	20			20	80					5.0							
41		BS	UC	APM 3210	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80							5.0					
42		BS	UC	OK 3212	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80								5.0				

43	Design and Technology	BS	ES	PMSC 4220	Mechanical and design assembly room	5	11	11			5/150	20		30			20	80												5.0	
44		AS	UC	MM 3308	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64											4.0		
45		AS	UC	PPMK 4309	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80												5.0	
46	Profiling	BS	ES	TSM 3226	Technology of agricultural engineering	5	8	8		8	5/150	20	10.0	20			20	80													
47		BS	ES	MR 4221	Manipulators and robots	5	11	11			5/150	20	10.0	20			20	80												5.0	
48		BS	ES	PZ 4222	Patent Law	4	12	12			4/120	20		20			16	64													4.0
49		**AS**	**UC**	**UP 1311**	**Practical training**	**2**	**3**				**2/60**					60					2.0									
50		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150							5.0							
51		AS	UC	AORM 3304	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80											5.0		
52		**AS**	**UC**	**PP 3305**	**Internship**	**6**	**9**				**6/180**					180												6.0		
53		AS	UC	MIETM 4306	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112												7.0	
54		AS	UC	MSSO 4310	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112												7.0	
55		**AS**	**UC**	**PP 4307**	**Internship**	**6**	**10**				**6/180**					180												6.0		
56	Organizational-economic	AS	ES	PM 4312	Production management	4	12	12			4/120	20		20			16	64													4.0
Additional modules beyond qualification																															
Modules of choice																															
Scientifically research																															
Weekly average workload at hours																			57	60	63	60	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**	**56**		**12**	**6**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**10**	**16**	**16**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**				
	Core subjects(GER/CS)	51		11	6	0	1530	100	30	540	0	0	172	688	10	16	16	2	6	1	0	0	0	0	0	0				
	University component(GER/UC)	5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0				
	Electives(GER/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2	**Base requirements(BS)**	**112**		**26**	**0**	**3**	**3360**	**410**	**280**	**430**	**0**	**0**	**448**	**1792**	**9**	**4**	**3**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**				
	Core subjects(BS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BS/UC)	54		13	0	2	1620	160	160	220	0	0	216	864	9	0	3	10	4	9	9	5	0	0	5	0				
	Electives(BS/ES)	58		13	0	1	1740	250	120	210	0	0	232	928	0	4	0	4	5	5	11	10	5	0	10	4				
3	**Profession requirements(VRS)**	**60**		**8**	**0**	**1**	**1800**	**180**	**90**	**140**	**0**	**570**	**164**	**656**	**0**	**0**	**2**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**				
	Core subjects(VRS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(VRS/UC)	56		7	0	1	1680	160	90	120	0	570	148	592	0	0	2	4	5	5	0	0	15	20	5	0				
	Electives(VRS/ES)	4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4				
4	**Disciplines for the formation of professional competencies(BDFPC)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDFPC/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDFPC/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDFPC/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDPD/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDPD/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDPD/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Total on curriculum		228			**6**	**4**	**6840**	**710**	**400**	**1140**	**0**	**570**	**804**	3216	19	**20**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8				
6	**Additional courses**										**Number of credits**				**Semester**				**Number of hours**				**Number of weeks**							
7	**Module of final certification (MoFC)**										**12**								**360.0**											
Total including FCS											**240**								**7200.0**											

Admission year: 25-05-2021 to the EP 6B07105 Mechanical Engineering

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period											
												Classroom work					Independent work of students		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
																			Number of weeks in the academic period											
																			10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	linguistic	GER	CS	IYa 1101	Foreign language	4	1	1			4/120			40			16	64	4.0												
2		GER	CS	KRYa 1102	Kazakh (russian) language	4	1	1			4/120			40			16	64	4.0												
3		GER	CS	IYa 1104	Foreign language	3	2	2			3/90			30			12	48		3.0											
4		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0											
5		GER	CS	IYa 1109	Foreign language	3	3	3			3/90			30			12	48			3.0										
6		GER	CS	KRYa 1110	Kazakh (russian) language	3	3	3			3/90			30			12	48			3.0										
7	qwewr	GER	CS	FK 1103	Physical education.	2	1		1		2/60			60					2.0												
8		GER	CS	FK 1108	Physical education.	1	2		2		1/30			30						1.0											
9		GER	CS	IKT 1112	Information and communication technologies	5	3	3			5/150	20	30.0				20	80			5.0										
10		GER	CS	FK 1113	Physical education.	1	3		3		1/30			30							1.0										
11		GER	CS	FK 2114	Physical education.	2	4		4		2/60			60								2.0									
12		GER	CS	FK 2116	Physical education.	1	5		5		1/30			30									1.0								
13		GER	CS	FK 2117	Physical education.	1	6		6		1/30			30										1.0							
14		GER	UC	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80								5.0					
15	social and political	GER	CS	PS 1107	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0											
16		GER	CS	SIK 1106	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0											
17		GER	CS	KP 1111	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0										
18		GER	CS	Fil 2115	Philosophy	5	5	5			5/150	20		30			20	80					5.0								
Modules of specialty/education programm																														
19	Base	BS	UC	Mat 1201	Mathematics	5	1	1			5/150	20		30			20	80	5.0												
20		BS	UC	Fiz 1202	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0												
21		BS	UC	NGIG 1203	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0										
22		BS	UC	Mat 2204	Mathematics	4	4	4			4/120	20		20			16	64				4.0									
23		BS	ES	Him 2215	Chemistry	4	4	4			4/120	20	20.0				16	64				4.0									
24		BS	UC	Fiz 2205	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0									
25		BS	UC	NGIG 2206	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0									
26		BS	ES	MZh 3218	Mechanization of cattle-breeding farm	5	8	8			5/150	20	10.0	20			20	80								5.0					
27		BS	ES	SM 3219	Agreecultural machines	5	9	9			5/150	20	10.0	20			20	80									5.0				
28	General Technical	BS	ES	OUKGM 1214	Basics of organization of wheeled and casterpillar machines	4	2	2			4/120	20	20.0				16	64		4.0											
29		BS	UC	IM 2207	Engineering mechanics	4	5	5			4/120	10	10.0	20			16	64					4.0								
30		BS	ES	EOE 2216	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0								
31		BS	UC	MM 2208	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0							
32		BS	UC	IS 2209	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0							
33		BS	ES	EMP 2217	Electric machines and drives	5	6	6			5/150	20	10.0	20			20	80						5.0							
34		BS	UC	AVCh 3211	Draft execution automation.	4	7	7			4/120		20.0	20			16	64							4.0						
35		BS	ES	TOT 3223	Thermal Engineering and Thermodynamics Basics	3	7	7			3/90	10		20			12	48							3.0						
36		BS	ES	PK 3224	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64							4.0						
37		BS	ES	PGP 3225	Pneumatic and hydraulic drives	4	7	7			4/120	20	10.0	10			16	64							4.0						
38		BS	UC	SChOM 4213	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80											5.0		
39		AS	UC	MIP 2301	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0									
40		AS	UC	TRRIO 2302	Cutting theory, cutting tools and tooling	5	5	5			5/150	20	10.0	20			20	80					5.0								
41		BS	UC	APM 3210	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80							5.0						
42		BS	UC	OK 3212	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80								5.0					

43	Design and Technology	BS	ES	PMSC 4220	Mechanical and design assembly room	5	11	11			5/150	20		30			20	80											5.0	
44		AS	UC	MM 3308	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64									4.0			
45		AS	UC	PPMK 4309	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80											5.0	
46		BS	ES	TSM 3226	Technology of agricultural engineering	5	8	8		8	5/150	20	10.0	20			20	80								5.0				
47		BS	ES	MR 4221	Manipulators and robots	5	11	11			5/150	20	10.0	20			20	80											5.0	
48		BS	ES	PZ 4222	Patent Law	4	12	12			4/120	20		20			16	64												4.0
49		**AS**	**UC**	**UP 1311**	**Practical training**	**2**	**3**				**2/60**					60					2.0									
50	Profiling	**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150								5.0						
51		AS	UC	AORM 3304	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80									5.0			
52		**AS**	**UC**	**PP 3305**	**Internship**	**6**	**9**				**6/180**					180											6.0			
53		AS	UC	MIETM 4306	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112										7.0		
54		AS	UC	MSSO 4310	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112										7.0		
55		**AS**	**UC**	**PP 4307**	**Internship**	**6**	**10**				**6/180**					180												6.0		
56	Organizational-economic	AS	ES	PM 4312	Production management	4	12	12			4/120	20		20			16	64												4.0
Additional modules beyond qualification																														
Modules of choice																														
Scientifically research																														
Weekly average workload at hours																			57	60	63	60	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**					**56**		**12**	**6**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**10**	**16**	**16**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**
	Core subjects(GER/CS)					51		11	6	0	1530	100	30	540	0	0	172	688	10	16	16	2	6	1	0	0	0	0	0	0
	University component(GER/UC)					5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0
	Electives(GER/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	**Base requirements(BS)**					**112**		**26**	**0**	**3**	**3360**	**410**	**280**	**430**	**0**	**0**	**448**	**1792**	**9**	**4**	**3**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**
	Core subjects(BS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BS/UC)					54		13	0	2	1620	160	160	220	0	0	216	864	9	0	3	10	4	9	9	5	0	0	5	0
	Electives(BS/ES)					58		13	0	1	1740	250	120	210	0	0	232	928	0	4	0	4	5	5	11	10	5	0	10	4
3	**Profession requirements(VRS)**					**60**		**8**	**0**	**1**	**1800**	**180**	**90**	**140**	**0**	**570**	**164**	**656**	**0**	**0**	**2**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**
	Core subjects(VRS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(VRS/UC)					56		7	0	1	1680	160	90	120	0	570	148	592	0	0	2	4	5	5	0	0	15	20	5	0
	Electives(VRS/ES)					4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4
4	**Disciplines for the formation of professional competencies(BDFPC)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDFPC/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDFPC/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDFPC/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDPD/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDPD/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDPD/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total on curriculum						228			**6**	**4**	**6840**	**710**	**400**	**1140**	**0**	**570**	**804**	3216	19	**20**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8
6	**Additional courses**															**Number of credits**			**Semester**				**Number of hours**				**Number of weeks**			
7	**Module of final certification (MoFC)**															**12**							**360.0**							
Total including FCS																**240**							**7200.0**							

Admission year: 25-05-2020 to the EP 6B07104 Technological machines and equipment

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period											
												Classroom work						Independent work of students		1 course			2 course			3 course			4 course		
																				1	2	3	4	5	6	7	8	9	10	11	12
																				Number of weeks in the academic period											
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students		10	10	10	10	10	10	10	10	10	10	10	10
General modules																															
1	linguistic	GER	CS	IYa 1101	Foreign language	4	1	1			4/120			40			16	64		4.0											
2		GER	CS	KRYa 1102	Kazakh (russian) language	4	1	1			4/120			40			16	64		4.0											
3		GER	CS	IYa 1104	Foreign language	3	2	2			3/90			30			12	48			3.0										
4		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/90			30			12	48			3.0										
5		GER	CS	IYa 1109	Foreign language	3	3	3			3/90			30			12	48				3.0									
6		GER	CS	KRYa 1110	Kazakh (russian) language	3	3	3			3/90			30			12	48				3.0									
7	qwewr	GER	CS	FK 1103	Physical education.	2	1		1		2/60			60						2.0											
8		GER	CS	FK 1108	Physical education.	1	2		2		1/30			30							1.0										
9		GER	CS	IKT 1112	Information and communication technologies	5	3	3			5/150	20	30.0				20	80				5.0									
10		GER	CS	FK 1113	Physical education.	1	3		3		1/30			30								1.0									
11		GER	CS	FK 2114	Physical education.	2	4		4		2/60			60									2.0								
12		GER	CS	FK 2116	Physical education.	1	5		5		1/30			30										1.0							
13		GER	CS	FK 2117	Physical education.	1	6		6		1/30			30											1.0						
14		GER	UC	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80										5.0			
15	social and political	GER	CS	PS 1107	Political science and sociology	4	2	2			4/120	20		20			16	64			4.0										
16		GER	CS	SIK 1106	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80			5.0										
17		GER	CS	KP 1111	Cultural studies and psychology	4	3	3			4/120	20		20			16	64				4.0									
18		GER	CS	Fil 2115	Philosophy	5	5	5			5/150	20		30			20	80						5.0							
Modules of specialty/education programm																															
19	Base	BS	UC	Mat 1201	Mathematics	5	1	1			5/150	20		30			20	80		5.0											
20		BS	UC	Fiz 1202	Physics	4	1	1			4/120	20	10.0	10			16	64		4.0											
21		BS	UC	NGIG 1203	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48				3.0									
22		BS	UC	Mat 2204	Mathematics	4	4	4			4/120	20		20			16	64					4.0								
23		BS	ES	Him 2215	Chemistry	4	4	4			4/120	20	20.0				16	64					4.0								
24		BS	UC	Fiz 2205	Physics	3	4	4			3/90	10	10.0	10			12	48					3.0								
25		BS	UC	NGIG 2206	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48					3.0								
26		BS	ES	MZh 3218	Mechanization of cattle-breeding farm	5	8	8			5/150	20		30			20	80										5.0			
27		BS	ES	SM 3219	Agreecultural machines	5	9	9			5/150	20	10.0	20			20	80											5.0		
28	General Technical	BS	ES	OUKGM 1214	Basics of organization of wheeled and casterpillar machines	4	2	2			4/120	20	20.0				16	64			4.0										
29		BS	UC	IM 2207	Engineering mechanics	4	5	5			4/120	10	10.0	20			16	64						4.0							
30		BS	ES	EOE 2216	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80						5.0							
31		BS	UC	MM 2208	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64							4.0						
32		BS	UC	IS 2209	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80							5.0						
33		BS	ES	EMP 2217	Electric machines and drives	5	6	6			5/150	20	10.0	20			20	80							5.0						
34		BS	UC	AVCh 3211	Draft execution automation.	4	7	7			4/120		20.0	20			16	64								4.0					
35		BS	ES	TOT 3223	Thermal Engineering and Thermodynamics Basics	3	7	7			3/90	10		20			12	48								3.0					
36		BS	ES	PK 3224	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64								4.0					
37		BS	ES	PGP 3225	Pneumatic and hydraulic drives	4	7	7			4/120	20	10.0	10			16	64								4.0					
38		BS	UC	SChOM 4213	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80												5.0	
39		AS	UC	MIP 2301	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64					4.0								
40		AS	UC	TRRIO 2302	Cutting theory, cutting tools and tooling	5	5	5			5/150	20	10.0	20			20	80						5.0							
41	Design and Technology	BS	UC	APM 3210	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80								5.0					
42		BS	UC	OK 3212	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80										5.0			
43		BS	ES	PMSC 4220	Mechanical and design assembly room	5	11	11			5/150	20		30			20	80												5.0	
44		AS	UC	MM 3308	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64											4.0		
45		AS	UC	PPMK 4309	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80												5.0	
46		BS	ES	TSM 3226	Technology of agricultural engineering	5	8	8		8	5/150	20	10.0	20			20	80										5.0			
47		BS	ES	MR 4221	Manipulators and robots	5	11	11			5/150	20	10.0	20			20	80												5.0	
48		BS	ES	PZ 4222	Patent Law	4	12	12			4/120	20		20			16	64													4.0

49	Profiling	**AS**	**UC**	**UP 1311**	**Practical training**	**2**	**3**				**2/60**					60					2.0									
50		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150								5.0						
51		AS	UC	AORM 3304	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80									5.0			
52		**AS**	**UC**	**PP 3305**	**Internship**	**6**	**9**				**6/180**					180										6.0			
53		AS	UC	MIETM 4306	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112										7.0		
54		AS	UC	MSSO 4310	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112										7.0		
55		**AS**	**UC**	**PP 4307**	**Internship**	**6**	**10**				**6/180**					180											6.0		
56	Organizational-economic	AS	ES	PM 4312	Production management	4	12	12			4/120	20		20			16	64												4.0
Additional modules beyond qualification																													
Modules of choice																													
Scientifically research																													
Weekly average workload at hours																			57	60	63	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**					**56**		**12**	**6**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**10**	**16**	**16**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**
	Core subjects(GER/CS)					51		11	6	0	1530	100	30	540	0	0	172	688	10	16	16	2	6	1	0	0	0	0	0	0
	University component(GER/UC)					5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0
	Electives(GER/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	**Base requirements(BS)**					**112**		**26**	**0**	**3**	**3360**	**410**	**270**	**440**	**0**	**0**	**448**	**1792**	**9**	**4**	**3**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**
	Core subjects(BS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BS/UC)					54		13	0	2	1620	160	160	220	0	0	216	864	9	0	3	10	4	9	9	5	0	0	5	0
	Electives(BS/ES)					58		13	0	1	1740	250	110	220	0	0	232	928	0	4	0	4	5	5	11	10	5	0	10	4
3	**Profession requirements(VRS)**					**60**		**8**	**0**	**1**	**1800**	**180**	**90**	**140**	**0**	**570**	**164**	**656**	**0**	**0**	**2**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**
	Core subjects(VRS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(VRS/UC)					56		7	0	1	1680	160	90	120	0	570	148	592	0	0	2	4	5	5	0	0	15	20	5	0
	Electives(VRS/ES)					4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4
4	**Disciplines for the formation of professional competencies(BDFPC)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDFPC/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDFPC/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDFPC/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDPD/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDPD/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDPD/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total on curriculum						228			**6**	**4**	**6840**	**710**	**390**	**1150**	**0**	**570**	**804**	3216	19	**20**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8
6	**Additional courses**															**Number of credits**			**Semester**				**Number of hours**				**Number of weeks**		
7	**Module of final certification (MoFC)**															**12**							**360.0**						
Total including FCS																**240**							**7200.0**						

Admission year: 25-05-2020 to the EP 6B07105 Mechanical Engineering

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period										
												Classroom work						Independent work of students		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
																			Number of weeks in the academic period											
																			10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	linguistic	GER	CS	KRYa 1101	Kazakh (russian) language	4	1	1			4/120			40			16	64	4.0											
2		GER	CS	IYa 1102	Foreign language	4	1	1			4/120			40			16	64	4.0											
3		GER	CS	KRYa 1104	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0										
4		GER	CS	IYa 1105	Foreign language	3	2	2			3/90			30			12	48		3.0										
5		GER	CS	IYa 1110	Foreign language	3	3	3			3/90			30			12	48			3.0									
6		GER	CS	KRYa 1111	Kazakh (russian) language	3	3	3			3/90			30			12	48			3.0									
7	qwewr	GER	CS	FK 1103	Physical education.	2	1		1		2/60			60					2.0											
8		GER	CS	FK 1108	Physical education.	1	2		2		1/30			30						1.0										
9		GER	CS	IKT 1109	Information and communication technologies	5	3	3			5/150	20	30.0				20	80			5.0									
10		GER	CS	FK 1113	Physical education.	1	3		3		1/30			30							1.0									
11		GER	CS	FK 2114	Physical education.	2	4		4		2/60			60								2.0								
12		GER	CS	FK 2116	Physical education.	1	5		5		1/30			30									1.0							
13		GER	CS	FK 2117	Physical education.	1	6		6		1/30			30										1.0						
14		GER	UC	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80							5.0					
15	social and political	GER	CS	PS 1107	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0										
16		GER	CS	SIK 1106	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0										
17		GER	CS	KP 1112	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0									
18		GER	CS	Fil 2115	Philosophy	5	5	5			5/150	20		30			20	80					5.0							
Modules of specialty/education programm																														
19	Base	BS	UC	Mat 1201	Mathematics	5	1	1			5/150	20		30			20	80	5.0											
20		BS	UC	Fiz 1202	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0											
21		BS	UC	NGIG 1203	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0									
22		BS	ES	FKH 2215	Physical and colloid chemistry	4	4	4			4/120	20	20.0				16	64				4.0								
23		BS	UC	Mat 2204	Mathematics	4	4	4			4/120	20		20			16	64				4.0								
24		BS	UC	Fiz 2205	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0								
25		BS	UC	NGIG 2206	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0								
26		BS	ES	MAPPZh 3219	Machines and Apparatus for Processing Livestock Products	5	8	8			5/150	20		30			20	80							5.0					
27		BS	ES	MAPPR 3220	Machines and equipment for processing of crop products	5	9	9			5/150	20	10.0	20			20	80								5.0				
28	General Technical	BS	ES	OTPP 1214	Fundamentals of technology processing industries	4	2	2			4/120	20	20.0				16	64		4.0										
29		BS	ES	EOE 2216	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0							
30		BS	UC	IMSD 2207	Engineering mechanics (Statics, Dynamics)	4	5	5			4/120	10	10.0	20			16	64					4.0							
31		BS	UC	MM 2208	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0						
32		BS	ES	AE 2217	Automatic electric driver	5	6	6			5/150	20	10.0	20			20	80						5.0						
33		BS	UC	IS 2209	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0						
34		BS	ES	PK 3222	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64							4.0					
35		BS	ES	MZhG 3223	Mechanics of liquid and gas	4	7	7			4/120	20	10.0	10			16	64							4.0					
36		BS	ES	THOPP 3218	Thermal and refrigerating equipment of food production	3	7	7			3/90	10		20			12	48							3.0					
37		BS	UC	AVCh 3211	Draft execution automation.	4	7	7			4/120		20.0	20			16	64							4.0					
38		BS	UC	SChOM 4213	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80											5.0	
39		AS	UC	MIP 2301	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0								
40		AS	UC	TRRIO 2302	Cutting theory, cutting tools and tooling	5	5	5			5/150	20	10.0	20			20	80					5.0							
41	Design and Technology	BS	UC	APM 3210	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80							5.0					
42		BS	UC	OK 3212	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80								5.0				
43		BS	ES	RPMPP 4225	Calculation and design of food production machines	5	11	11			5/150	20		30			20	80											5.0	
44		AS	UC	MM 3308	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64									4.0			
45		AS	UC	PPMK 4309	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80											5.0	
46		BS	ES	TPAPP 3224	Technological processes and apparatus of food production	5	8	8		8	5/150	20	10.0	20			20	80								5.0				

47	Profiling	BS	ES	PTUPP 4221	Hoisting and transport installations of food productions	5	11	11			5/150	20	10.0	20			20	80										5.0		
48		BS	ES	OI 4226	Fundamentals of engineering	4	12	12			4/120	20		20			16	64												4.0
49		**AS**	**UC**	**UP 1311**	**Practical training**	**2**	**3**				**2/60**					60					2.0								
50		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150								5.0					
51		AS	UC	AORM 3304	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80									5.0			
52		**AS**	**UC**	**PP 3305**	**Internship**	**6**	**9**				**6/180**					180										6.0			
53		AS	UC	MSSO 4310	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112										7.0		
54		AS	UC	MIETM 4306	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112										7.0		
55		**AS**	**UC**	**PP 4307**	**Internship**	**6**	**10**				**6/180**					180											6.0		
56	Organizational-economic	AS	ES	PM 4312	Production management	4	12	12			4/120	20		20			16	64												4.0
Additional modules beyond qualification																														
Modules of choice																														
Scientifically research																														
Weekly average workload at hours																			57	60	63	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**	**56**		**12**	**6**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**10**	**16**	**16**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**			
	Core subjects(GER/CS)	51		11	6	0	1530	100	30	540	0	0	172	688	10	16	16	2	6	1	0	0	0	0	0	0			
	University component(GER/UC)	5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0			
	Electives(GER/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2	**Base requirements(BS)**	**112**		**26**	**0**	**3**	**3360**	**410**	**270**	**440**	**0**	**0**	**448**	**1792**	**9**	**4**	**3**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**			
	Core subjects(BS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	University component(BS/UC)	54		13	0	2	1620	160	160	220	0	0	216	864	9	0	3	10	4	9	9	5	0	0	5	0			
	Electives(BS/ES)	58		13	0	1	1740	250	110	220	0	0	232	928	0	4	0	4	5	5	11	10	5	0	10	4			
3	**Profession requirements(VRS)**	**60**		**8**	**0**	**1**	**1800**	**180**	**90**	**140**	**0**	**570**	**164**	**656**	**0**	**0**	**2**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**			
	Core subjects(VRS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	University component(VRS/UC)	56		7	0	1	1680	160	90	120	0	570	148	592	0	0	2	4	5	5	0	0	15	20	5	0			
	Electives(VRS/ES)	4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4			
4	**Disciplines for the formation of professional competencies(BDFPC)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
	Core subjects(BDFPC/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	University component(BDFPC/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Electives(BDFPC/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			
	Core subjects(BDPD/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	University component(BDPD/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Electives(BDPD/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Total on curriculum		228			**6**	**4**	**6840**	**710**	**390**	**1150**	**0**	**570**	**804**	3216	19	**20**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8			
6	**Additional courses**											**Number of credits**			**Semester**				**Number of hours**				**Number of weeks**						
7	**Module of final certification (MoFC)**											**12**							**360.0**										
Total including FCS												**240**							**7200.0**										

Admission year: 15-08-2019 to the EP 6B07104 Technological machines and equipment

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period									
												Classroom work					Independent work of students		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
																			Number of weeks in the academic period											
																			10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	language	GER	CS	KRYa 1104	Kazakh (russian) language	3	1	1			3/90			30			12	48	3.0											
2		GER	CS	KRYa 1105	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0										
3		GER	CS	IYa 1102	Foreign language	3	2	2			3/90			30			12	48		3.0										
4		GER	CS	KRYa 1106	Kazakh (russian) language	4	3	3			4/120			40			16	64			4.0									
5		GER	CS	IYa 1103	Foreign language	3	3	3			3/90			30			12	48			3.0									
6	general education	GER	CS	FK 1112	Physical education.	2	1	1			2/60			60					2.0											
7		GER	CS	IYa 1101	Foreign language	4	1	1			4/120			40			16	64	4.0											
8		GER	CS	IKT 1111	Information and communication technologies	5	2	2			5/150	20	30.0				20	80		5.0										
9		GER	CS	FK 1113	Physical education.	1	2	2			1/30			30						1.0										
10		GER	CS	FK 1114	Physical education.	1	3	3			1/30			30							1.0									
11		GER	CS	FK 2115	Physical education.	2	4	4			2/60			60								2.0								
12		GER	CS	FK 2116	Physical education.	1	5	5			1/30			30									1.0							
13		GER	CS	FK 2117	Physical education.	1	6	6			1/30			30										1.0						
14		GER	ES	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80							5.0					
15		BS	ES	EOE 2222	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0							
16	social and political	GER	CS	PS 1109	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0										
17		GER	CS	SIK 1107	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0										
18		GER	CS	KP 1110	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0									
19		GER	CS	Fil 2108	Philosophy	5	5	5			5/150	20		30			20	80					5.0							
Modules of specialty/education programm																														
20	base	BS	UC	Mat 1203	Mathematics	5	1	1			5/150	20		30			20	80	5.0											
21		BS	UC	Fiz 1206	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0											
22		BS	UC	NGIG 1209	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0									
23		BS	UC	Mat 2204	Mathematics	4	4	4			4/120	20		20			16	64				4.0								
24		BS	UC	NGIG 2220	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0								
25		BS	ES	Him 2208	Chemistry	4	4	4			4/120	20	20.0				16	64				4.0								
26		BS	UC	Fiz 2207	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0								
27		BS	UC	IM 2218	Engineering mechanics	4	5	5			4/120	10	10.0	20			16	64					4.0							
28		BS	ES	EMP 2213	Electric machines and drives	5	6	6			5/150	20	10.0	20			20	80						5.0						
29		BS	UC	AVCh 3216	Draft execution automation.	4	7	7			4/120		20.0	20			16	64							4.0					
30		BS	ES	TOT 3224	Thermal Engineering and Thermodynamics Basics	3	7	7			3/90	10		20			12	48							3.0					
31		BS	UC	APM 3210	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80							5.0					
32		BS	ES	MZh 3214	Mechanization of cattle-breeding farm	5	8	8			5/150	20		30			20	80								5.0				
33		BS	UC	OK 3211	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80								5.0				
34		BS	ES	SM 3217	Agreecultural machines	5	9	9			5/150	20	10.0	20			20	80									5.0			
35		BS	UC	SChOM 4212	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80										5.0		
36		BS	ES	PMSC 4215	Mechanical and design assembly room	5	11	11			5/150	20		30			20	80										5.0		
37		BS	ES	MR 4221	Manipulators and robots	5	11	11			5/150	20	10.0	20			20	80										5.0		
38		AS	UC	MSSO 4308	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112									7.0			
39	profiling	**BS**	**UC**	**UP 1202**	**Practical training**	**2**	**3**				**2/60**					60					2.0								
40		BS	UC	IS 2223	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0						
41		BS	ES	PK 3225	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64							4.0					
42		BS	ES	PGP 3226	Pneumatic and hydraulic drives	4	7	7			4/120	20	10.0	10			16	64							4.0					
43		BS	ES	TSM 3227	Technology of agricultural engineering	5	8	8		8	5/150	20	10.0	20			20	80								5.0				
44		BS	ES	PZ 4205	Patent Law	4	12	12			4/120	20		20			16	64												4.0
45		AS	UC	MIP 2306	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0								
46		AS	UC	TRRIO 2307	Cutting theory, cutting tools and tooling	5	5	5			5/150	10	20.0	20			20	80					5.0							

47		**AS**	**UC**	**PP 2303**	**Internship**	**5**	**6**				**5/150**					150								5.0						
48		AS	UC	MM 3309	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64									4.0				
49		AS	UC	AORM 3302	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80									5.0				
50		**AS**	**UC**	**PP 3304**	**Internship**	**6**	**9**				**6/180**					180										6.0				
51		AS	UC	MIETM 4301	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112										7.0			
52		**AS**	**UC**	**PP 4305**	**Internship**	**6**	**10**				**6/180**					180											6.0			
53	general technical	BS	UC	MM 2201	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0							
54	design and technolog	AS	UC	PPMK 4310	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80												5.0	
55	organizational-economic	AS	ES	PM 4311	Production management	4	12	12			4/120	20		20			16	64													4.0
56		BS	ES	OUKGM 1219	Basics of organization of wheeled and casterpillar machines	4	3	3			4/120	20	20.0				16	64			4.0										
Additional modules beyond qualification																															
Modules of choice																															
Scientifically research																															
Weekly average workload at hours																			54	63	63	60	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**	**56**		**18**	**0**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**9**	**21**	**12**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**				
	Core subjects(GER/CS)	51		17	0	0	1530	100	30	540	0	0	172	688	9	21	12	2	6	1	0	0	0	0	0	0				
	University component(GER/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(GER/ES)	5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0				
2	**Base requirements(BS)**	**114**		**26**	**0**	**3**	**3420**	**410**	**270**	**440**	**0**	**60**	**448**	**1792**	**9**	**0**	**9**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**				
	Core subjects(BS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BS/UC)	56		13	0	2	1680	160	160	220	0	60	216	864	9	0	5	10	4	9	9	5	0	0	5	0				
	Electives(BS/ES)	58		13	0	1	1740	250	110	220	0	0	232	928	0	0	4	4	5	5	11	10	5	0	10	4				
3	**Profession requirements(VRS)**	**58**		**8**	**0**	**1**	**1740**	**170**	**100**	**140**	**0**	**510**	**164**	**656**	**0**	**0**	**0**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**				
	Core subjects(VRS/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(VRS/UC)	54		7	0	1	1620	150	100	120	0	510	148	592	0	0	0	4	5	5	0	0	15	20	5	0				
	Electives(VRS/ES)	4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4				
4	**Disciplines for the formation of professional competencies(BDFPC)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDFPC/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDFPC/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDFPC/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				
	Core subjects(BDPD/CS)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	University component(BDPD/UC)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Electives(BDPD/ES)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Total on curriculum		228			**0**	**4**	**6840**	**700**	**400**	**1150**	**0**	**570**	**804**	3216	18	**21**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8				
6	**Additional courses**										**Number of credits**				**Semester**				**Number of hours**				**Number of weeks**							
7	**Module of final certification (MoFC)**										**12**								**360.0**											
Total including FCS											**240**								**7080.0**											

Admission year: 15-08-2019 to the EP 6B07105 Mechanical Engineering

Module code	Module name	Discipline cycle	Discipline component	Code of subject	Subject name	Academic credits	Academic study period	Control in the academic period			Number of hours								Distribution of credits per academic period										
												Classroom work					Independent		1 course			2 course			3 course			4 course		
								Exams	Differentiated test	Term paper/project	Total	Lectures	Laboratory trainings	Practice	Studio lessons	Practice	Independent work of students with faculty staff	Independent work of students	1	2	3	4	5	6	7	8	9	10	11	12
																			Number of weeks in the academic period											
																			10	10	10	10	10	10	10	10	10	10	10	10
General modules																														
1	general education	GER	CS	FK 1112	Physical education.	2	1	1			2/60			60					2.0												
2		GER	CS	FK 1113	Physical education.	1	2	2			1/30			30						1.0											
3		GER	CS	IKT 1106	Information and communication technologies	5	2	2			5/150	20	30.0				20	80		5.0											
4		GER	CS	FK 1114	Physical education.	1	3	3			1/30			30							1.0										
5		GER	CS	FK 2115	Physical education.	2	4	4			2/60			60								2.0									
6		GER	CS	FK 2116	Physical education.	1	5	5			1/30			30									1.0								
7		GER	CS	FK 2117	Physical education.	1	6	6			1/30			30										1.0							
8		GER	ES	OTOBZh 3118	Labor protection and basics of life safety	5	8	8			5/150	20		30			20	80								5.0					
9	language module	GER	CS	KRYa 1101	Kazakh (russian) language	3	1	1			3/90			30			12	48	3.0												
10		GER	CS	IYa 1102	Foreign language	4	1	1			4/120			40			16	64	4.0												
11		GER	CS	KRYa 1103	Kazakh (russian) language	3	2	2			3/90			30			12	48		3.0											
12		GER	CS	IYa 1104	Foreign language	3	2	2			3/90			30			12	48		3.0											
13		GER	CS	IYa 1108	Foreign language	3	3	3			3/90			30			12	48			3.0										
14		GER	CS	KRYa 1109	Kazakh (russian) language	4	3	3			4/120			40			16	64			4.0										
15	social and political	GER	CS	PS 1110	Political science and sociology	4	2	2			4/120	20		20			16	64		4.0											
16		GER	CS	SIK 1105	The modern history of Kazakhstan	5	2	2			5/150	20		30			20	80		5.0											
17		GER	CS	KP 1111	Cultural studies and psychology	4	3	3			4/120	20		20			16	64			4.0										
18		GER	CS	Fil 2107	Philosophy	5	5	5			5/150	20		30			20	80					5.0								
Modules of specialty/education programm																														
19	basic disciplines	BS	UC	Fiz 1213	Physics	4	1	1			4/120	20	10.0	10			16	64	4.0												
20		BS	UC	Mat 1211	Mathematics	5	1	1			5/150	20		30			20	80	5.0												
21		BS	UC	NGIG 1214	Descriptive geometry and engineering graphics	3	3	3			3/90	10	20.0				12	48			3.0										
22		BS	UC	Mat 2219	Mathematics	4	4	4			4/120	20		20			16	64				4.0									
23		BS	UC	Fiz 2220	Physics	3	4	4			3/90	10	10.0	10			12	48				3.0									
24		BS	UC	NGIG 2221	Descriptive geometry and engineering graphics	3	4	4			3/90		30.0				12	48				3.0									
25		BS	ES	FKH 2209	Physical and colloid chemistry	4	4	4			4/120	20	20.0				16	64				4.0									
26		BS	ES	MAPPZh 3210	Machines and Apparatus for Processing Livestock Products	5	8	8			5/150	20		30			20	80								5.0					
27		BS	ES	MAPPR 3212	Machines and equipment for processing of crop products	5	9	9			5/150	20	10.0	20			20	80										5.0			
28	general technical	BS	ES	OTPP 1205	Fundamentals of technology processing industries	4	3	3			4/120	20	20.0				16	64			4.0										
29		BS	UC	IMSD 2203	Engineering mechanics (Statics, Dynamics)	4	5	5			4/120	10	10.0	20			16	64					4.0								
30		BS	ES	AE 2207	Automatic electric driver	5	6	6			5/150	20	10.0	20			20	80						5.0							
31		BS	UC	MM 2204	Mechanics of materials	4	6	6			4/120	10	10.0	20			16	64						4.0							
32		AS	UC	MIP 2306	Materials in engineering design	4	4	4			4/120	20	10.0	10			16	64				4.0									
33		**BS**	**UC**	**UP 1217**	**Practical training**	**2**	**3**				**2/60**					60					2.0									
34		BS	UC	IS 2222	Measuring Systems	5	6	6			5/150	20	10.0	20			20	80						5.0							
35		BS	ES	PK 3224	Industrial controllers	4	7	7			4/120	20	10.0	10			16	64							4.0						

36		BS	ES	MZhG 3225	Mechanics of liquid and gas	4	7	7			4/120	20	10.0	10			16	64							4.0						
37		BS	ES	TPAPP 3227	Technological processes and apparatus of food production	5	8	8		8	5/150	20	10.0	20			20	80								5.0					
38	profiling	BS	ES	OI 4223	Fundamentals of engineering	4	12	12			4/120	20		20			16	64													4.0
39		**AS**	**UC**	**PP 2302**	**Internship**	**5**	**6**				**5/150**					150								5.0						
40		AS	UC	AORM 3305	Failure analysis and repair of machines	5	9	9		9	5/150	20	10.0	20			20	80									5.0				
41		**AS**	**UC**	**PP 3303**	**Internship**	**6**	**9**				**6/180**					180										6.0				
42		AS	UC	MIETM 4301	Installation, testing and operation of technological machines	7	10	10			7/210	30	20.0	20			28	112										7.0			
43		**AS**	**UC**	**PP 4304**	**Internship**	**6**	**10**				**6/180**					180											6.0			
44	general technical	BS	ES	EOE 2201	Electrical engineering and the basics of electronics	5	5	5			5/150	20	10.0	20			20	80					5.0								
45		BS	UC	AVCh 3218	Draft execution automation.	4	7	7			4/120		20.0	20			16	64						4.0							
46	base	BS	UC	SChOM 4216	CNC system (Fundamentals of Mechatronics)	5	11	11			5/150	20		30			20	80											5.0		
47		AS	UC	MSSO 4311	Metal-working machines and welding equipment	7	10	10			7/210	30	20.0	20			28	112										7.0			
48	base	BS	ES	THOPP 3215	Thermal and refrigerating equipment of food production	3	7	7			3/90	10		20			12	48						3.0							
49		BS	ES	PTUPP 4202	Hoisting and transport installations of food productions	5	11	11			5/150	20	10.0	20			20	80											5.0		
50		BS	UC	APM 3206	Computer-Aided Mechanism Design	5	7	7		7	5/150	10	20.0	20			20	80						5.0							
51		BS	UC	OK 3208	Basics of design	5	8	8		8	5/150	10	20.0	20			20	80							5.0						
52	design and technology	BS	ES	RPMPP 4226	Calculation and design of food production machines	5	11	11			5/150	20		30			20	80											5.0		
53		AS	UC	TRRIO 2307	Cutting theory, cutting tools and tooling	5	5	5			5/150	10	20.0	20			20	80					5.0								
54		AS	UC	MM 3310	Metalworking Modeling	4	9	9			4/120	20	10.0	10			16	64								4.0					
55		AS	UC	PPMK 4308	Production processes (CAM, DTSP)	5	11	11			5/150	20	10.0	20			20	80											5.0		
56	organizational-economic	AS	ES	PM 4309	Production management	4	12	12			4/120	20		20			16	64													4.0
Additional modules beyond qualification																															
Modules of choice																															
Scientifically research																															
Weekly average workload at hours																			54	63	63	60	60	60	60	60	60	60	24
1	**General education subjects(GER)**					**56**		**18**	**0**	**0**	**1680**	**120**	**30**	**570**	**0**	**0**	**192**	**768**	**9**	**21**	**12**	**2**	**6**	**1**	**0**	**5**	**0**	**0**	**0**	**0**
	Core subjects(GER/CS)					51		17	0	0	1530	100	30	540	0	0	172	688	9	21	12	2	6	1	0	0	0	0	0	0
	University component(GER/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(GER/ES)					5		1	0	0	150	20	0	30	0	0	20	80	0	0	0	0	0	0	0	5	0	0	0	0
2	**Base requirements(BS)**					**114**		**26**	**0**	**3**	**3420**	**410**	**270**	**440**	**0**	**60**	**448**	**1792**	**9**	**0**	**9**	**14**	**9**	**14**	**20**	**15**	**5**	**0**	**15**	**4**
	Core subjects(BS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BS/UC)					56		13	0	2	1680	160	160	220	0	60	216	864	9	0	5	10	4	9	9	5	0	0	5	0
	Electives(BS/ES)					58		13	0	1	1740	250	110	220	0	0	232	928	0	0	4	4	5	5	11	10	5	0	10	4
3	**Profession requirements(VRS)**					**58**		**8**	**0**	**1**	**1740**	**170**	**100**	**140**	**0**	**510**	**164**	**656**	**0**	**0**	**0**	**4**	**5**	**5**	**0**	**0**	**15**	**20**	**5**	**4**
	Core subjects(VRS/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(VRS/UC)					54		7	0	1	1620	150	100	120	0	510	148	592	0	0	0	4	5	5	0	0	15	20	5	0
	Electives(VRS/ES)					4		1	0	0	120	20	0	20	0	0	16	64	0	0	0	0	0	0	0	0	0	0	0	4
4	**Disciplines for the formation of professional competencies(BDFPC)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDFPC/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDFPC/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDFPC/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	**Disciplines of personal development and the formation of leadership qualities(BDPD)**					**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Core subjects(BDPD/CS)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	University component(BDPD/UC)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Electives(BDPD/ES)					0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total on curriculum					228			**0**	**4**	**6840**	**700**	**400**	**1150**	**0**	**570**	**804**	3216	18	**21**	**21**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	8
6	**Additional courses**															**Number of credits**				**Semester**			**Number of hours**				**Number of weeks**		
7	**Module of final certification (MoFC)**															**12**							**360.0**						
	Total including FCS															**240**							**7200.0**						

Appendix 3. Matrix of achievability of the formed learning outcomes according to the educational program with the help of academic disciplines

№	Name of the discipline	Short description of the discipline	Number of credits	Quantities Generated learning resultso credits									
				PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
The cycle of general education disciplines is a mandatory component													
1	History of Kazakhstan (GE)	The history of Kazakhstan consists of 5 thematic blocks: Ancient people and the formation of a nomadic civilization, Turkic civilization and the Great Steppe, Kazakhstan in modern times (XVIII - early XX centuries), Kazakhstan as part of the Soviet administrative-command system, Kazakhstan in the world community (1991- 2022)	5	v									
2	Philosophy	The emergence and development of philosophy. Fundamentals of philosophical understanding of the world. Consciousness, soul and language. Genesis. Ontology and metaphysics. The philosophy of man and the value world. "Mangilik El" and "Rukhani zhangyru" - the philosophy of new Kazakhstan.	5	v									
3	Foreign language	The course program is designed for the volume of teaching - 300 hours, of which: 90 hours - classroom work and 180 hours - independent work. The course ends with a comprehensive exam. The course is designed for 3 trimesters. As a result of mastering the program, the student, depending on the level of training, reaches the level B1/) or B2 at the time of completion of the course	10	v									
4	Kazakh (russian) language	Language and his basic functions. Speech: kinds and forms of speech.Functionally-semantic types of speech. Functional styles of speech. General description of functional styles of speech.Common concept about scientific style of speech.Features of scientific style at lexical, morphological, syntactic level. Text as leading unit of verbal communication. segmentation of text.Theme of text. Structure and sense of text. Communicative tasks of text.A role of suggestion is in text. function of suggestion. Progression of text as increase of his volume and information content.Compression as basic type of processing of scientific text.	10	v									

		A plan and his drafting are in a scientific sphere. Types of plans. scientific text. Composition-semantic structure of scientific text. Summarizing of scientific text. Annotating of scientific texts. Types of lemmatas. Reviewing of scientific texts. Types of reports. Criticizing of scientific text. Structure of scientific review. Review about the advanced study.										
5	Information and communication technologies	The discipline "ICT" includes the following topics: purpose, content and development trends of ICT; methods for collecting, storing and processing information; architecture of computer systems and networks; software and hardware for computer systems and networks for collecting, transmitting, processing and storing data; Internet resources, cloud and mobile services, Smart technologies	5		v		v					
6	Political science and sociology	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.	4	v								
7	Cultural studies and psychology	Formation of students understanding of culture as the highest human value, to facilities the development of cultural needs for independent assimilation of cultural values, to reveal the essence of the main problems of modern cultural studies and the creation of a holistic view of the psyche, personality and the creative nature of the human psyche, the ability to work in a team. Training in the skills of socio-psychological analysis and resolution of specific professional situations.	4	v								
8	Physical education	The formation of positive attitude, interest and need for physical education and sports. The 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	8	v								

		and competitions in sports, with broad-based participation of students in the active physical culture. The Comprehensive use of physical culture and sports as a general physical training. Improving the level of physical and functional status. Preventive use of physical training for health purposes. The students gain additional, necessary knowledge on the basics of psychological, pedagogical, medical and biological control according to the method and organization of independent exercise and "lifelong" sports.											
Cycle of general education disciplines Elective component													
9	Basics of economics and law	The purpose of teaching the discipline is: the formation of knowledge on the basics of economics and law; skills in practice to use the knowledge gained on the basic legal and economic laws, to establish relationships between the state, legal and economic phenomena, to determine the properties of legal entities; possession of economic categories and laws, the institutional and legal basis of the activities of economic entities and business ethics, the basics anti-corruption culture.	5	v								v	
10	Labor protection and basics of life safety	Formation of students knowledge, practical skills and abilities to create safe and healthy working conditions, to prevent the causes and conditions the emergence of a dangerous situations, to protect the population and production staff of national economy objects from the consequences of possible emergencies. The specific features of labor protection for women and youth, supervision and control of the implementation of health and safety legislation and liability for violations of the requirements of	5					v					
11	Introduction to leadership in education	Models of effective communication leader. Ways to manage in critical situations. Work techniques in the management team and the principles of the distribution of roles in the team. Techniques for effective control and motivation of learning. Leadership Theory. Concepts of leadership behavior (three leadership styles (K. Levin), Ohio State University research, University of Michigan studies, management systems (R. Likert), managerial framework (Blake and Moughton), the concept of reward and punishment, leadership substitutes (S. Kerr and J. Dzhermier).	5			v							
12	Innovative entrepreneurship	Formation of students" knowledge fundamental concepts of innovative development, modern approaches of entrepreneurial activity in the field of new technologies to ensure the competitiveness of innovative enterprise in	5	v									

		the market. Economic essence of innovative entrepreneurship. Business-planning. Venture financing. Types of firms with venture capital. Risk management. Human resource management in innovation management. Innovation processes as a condition for economic growth.											
13	**Basics of anti-corruption culture**	Theoretical and methodological foundations of the concept of "corruption" Improving the socio-economic relations of Kazakhstan society as a condition for countering corruption Psychological features of the nature of corrupt behavior Formation of anti-corruption culture Features of the formation of anti-corruption culture of youth Ethnic features of the formation of anti-corruption culture Moral and ethical responsibility for corruption in various fields. Legal liability for corruption offenses	5	v									
Cycle of basic disciplines University component													
14	Mathematics	General provisions Elements of linear algebra (determinants of the second and third orders, their properties, linear operations on matrices, systems of linear equations, analytical geometry on the plane, analytical geometry in space) Functions, limits, derivatives of one variable (methods of function transfer,function derivatives, high-frequency derivatives, function study,function study on clipping, convexity) One variable function integral (initial function, integration of simple parts, definite integral, application of Integral)	9		v				v				
15	Physics	Formation of students' scientific worldview and modern physical thinking and practical application of the laws of physics necessary to solve engineering problems based on physical laws, phenomena and processes, the study of basic physical quantities and definitions and units of measurement.	7		v			v					
16	Descriptive geometry and engineering graphics	Development of spatial imagination and instilling the skills of correct logical thinking, methods of constructing images of spatial forms on a plane, measuring these forms, allowing the transformation of images, rules for design documentation in accordance with the Unified System of Design Documentation (ESCD), execution and reading of drawings of individual parts and assembly units.	6				v	v					
17	Materials in engineering design	The ability to possess knowledge of the structure of the composition and properties of various materials (metals and nonmetals) to understand the technologies and methods of obtaining materials processing, using modern machines, machines and equipment to solve design, operational, experimental, research and design problems.	4		v								v

18	Engineering mechanics	The development of the discipline considers the general laws of the mechanical movement of bodies and their equilibrium. The main provisions related to the laws of equilibrium and motion of points of a mechanical system, taking into account the geometric forms of motion and under the influence of factors causing certain types of motion. Methods of transformation of systems of forces and conditions of equilibrium of material bodies, general laws of dynamics of motion of mechanical systems necessary for solving engineering problems. Confirmation of the reliability of the oretical know ledge byexperience.	4				v	v					
19	Electrical engineering and the basics of electronics	Basic concepts and definitions of electrical and magnetic circuits , the basic laws and methods for calculating electrical circuits, electromagnetism and basic concepts, electrical circuits of three-phase alternating current, basic concepts, the construction of vector and wave diagrams, basic concepts of industrial electronics.	5		v				v	v			
20	Mechanics of materials	Mastering the basic concepts and definitions set out in the sections: theoretical mechanics, theory of mechanisms and machines, resistance of materials. Basic concepts, laws and models of mechanics, kinematics and hydromechanics, classification of mechanisms, assemblies and parts, performance criteria and factors affecting them, dynamics of energy conversion into mechanical work, analysis of the functionality of mechanisms and their applications.	4					v					v
21	Measuring Systems	The concept of measuring and control. Principles of choice of SI. Limiting errors of the most common universal measuring instruments. The concept of testing and control. Limit gauges. Rules of operation, setting SI, measurement methods. 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 (USTL).	5			v					v	v	
22	Metal-working machines and welding equipment	Classification of machines. Features of building control systems. Features of the device drives. Feedback devices. Devices automatic tool changer machines. Technological equipment of machines. Features of the development of technological processes. Precision machining. Plasma and laser cutting machines, bending and welding machines and CNC presses. Electrical circuits of machines. Troubleshooting machine problems.	7							v	v		
23	CNC system	Study of the structures and principles of integration of mechatronic and	5							v	v		

	(Fundamentals of Mechatronics)	robotic systems, mechatronic rotational motion modules based on high-torque motors features of setting control tasks for mechatronic and robotic systems, definition and terminology of mechatronics. Terms and definitions of robotics. Structure and principles of integration of mechatronic and robotic systems											
24	Manipulators and robots	Classification of hoisting machines, manipulators and robots. Construction of lifting machines. Load gripping devices. Elements of cargo and traction devices. Stops and brakes. Mechanisms for lifting and changing the boom. Movement mechanisms. Rotation mechanisms. Device manipulators and industrial robots. Drives of industrial robots. Robot control systems.	5							v	v		
25	Metalworking Modeling	Methods for compiling mathematical models (empirical, experimental-analytical, theoretical), methods for obtaining a regression equation (passive experiment, active experiment, determining the response of an object to standard perturbations). Methodological basis of optimization. Necessary conditions for the application of optimization methods. Simulate systems with continuous, discrete and hybrid properties.	5				v				v		
26	Draft execution automation.	Study of the basic principles and methodologies of modern computer-aided design when creating electronic tools, methods and techniques for solving problems in the main sections of the discipline using design automation tools, creation of mathematical models of construction, automation of preparation and release of design and technological documentation: SolidWorks systems, Compass 3D, Altium Designer, T-Flex CAD.	4				v	v					
27	**Automated design of mechanisms**	Consolidation, generalization, and expansion of the knowledge gained in the study of basic disciplines, acquire new knowledge and form skills and abilities in the use of computers for the design, analysis and maintenance of machines and mechanisms necessary for the study of special disciplines and for subsequent professional activity. fundamentals of design and modeling, calculation, and analysis, as well as structures used in general technical and agricultural engineering products.	5				v	v					
28	Basics of design	To develop students' elementary skills in designing and designing mechanisms and machine parts; mastering by students the provisions of the system of standards for the implementation, design, storage and use of design documentation, theoretical foundations and requirements of the ESKD standards fundamentals of designing mechanisms for general machine-building, purpose and development of practical skills in solving	5				v	v					

		complex design tasks.											
29	Basics of patenting and professional creative	Familiarization with the conceptual foundations of inventive activity as a modern complex science of intellectual property objects. Obtaining sustainable knowledge on the method of activating creative thinking when creating objects of industrial property. skills of independent patent search, drawing up applications for inventions	4	v								v	
Cycle of basic disciplines Elective component													
30	Chemistry	Discipline studies modern ideas about the structure and properties of inorganic substances, the foundations of chemical methods of analysis used in assessing water quality. Studies the properties of the most important classes of inorganic compounds in conjunction with their structure; patterns of chemical processes; methods and achievements of chemical science.	4		v								v
31	Physical and colloid chemistry	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).	4		v								v
32	Basics of organization of wheeled and casterpillar machines	To determine the details, the basic components and mechanisms in wheeled and tracked machines, to regulate their work; to recognize technological machines and tools, their components and parts, identify and troubleshoot; skills to identify possible faults, determine the cause and maintenance of systems and components of wheeled and tracked vehicles	4			v				v	v		
33	Fundamentals of technology processing industries	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	4	v		v						v	
34	Automatic electric driver	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.	5						v	v			
35	Electric machines and drives	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	5						v	v			

		and calculation of mechanical characteristics and transients in electric drives.												
36	Mechanization of cattle-breeding farm	Technological bases of design 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; Design and completion of production technological lines of livestock farms and complexes.	5			v					v		v
37	Machines and Apparatus for Processing Livestock 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	5			v					v		v
38	Machines and equipment for processing of crop products	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	5			v					v		v
39	Agricultural machines	The device of agricultural machines and their adjustment to the specified working conditions; the principle of operation of the agricultural machinery and agrotechnical requirements; the basic principles and patterns of interaction of the working bodies of machines with the processed material; assessment of the quality of technological operations, methods and means of quality control of agricultural machines.	5			v					v		v
40	Calculation and design of food production machines	Concepts and definitions that 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	5				v					v	

		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.											
41	Mechanical and design assembly room	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	5				v					v	
Cycle of profile disciplines University component													
42	Design of machine fixtures	Acquisition by students of skills in the field of designing machine tools for various purposes for the implementation of technological processes for the production of agricultural and food engineering products. Know the methodology for designing and calculating machine tools, basing and fixing workpieces on machines. Obtaining the required accuracy of workpiece processing at high process productivity, ensuring work safety and reducing worker fatigue.	4				v				v	v	
43	Production processes (CAM, DTSP)	Discipline studies the totality of actions of workers and labor tools, as a result of which raw materials, materials, and components delivered to the enterprise are transformed into finished products or services in a predetermined quantity and a given property, quality and assortments for a certain period. Explains the production process consisting of main, auxiliary and serving processes. Technical and organizational-economic characteristics of the production process at the enterprise, types of products, production volume, types and types of applied equipment and technology, level of specialization.	5									v	v
44	Cutting theory, cutting tools and tooling	Studying the basics of cutting theory; structural and tool materials, cutting kinematics, cutter design and geometry; chip formation process; force factors during cutting; heat and temperature in the cutting zone; wear and destruction of blades of metal-cutting tools; tool life and cutting speed; methods for assigning cutting conditions during processing. Types of multi-blade machining and cutting tool used. Drilling, countersinking, reaming, milling, piercing and broaching, thread forming methods and thread forming tools, abrasive processing.	4								v		v

45	Failure analysis and repair of machines	Mastering the basics of technical conditions and rules for the rational operation of transport and transport-technological machines and equipment, the causes and consequences of the termination of their operability, organization of technical inspection and maintenance of equipment, acceptance and development of the introduced technological equipment, drawing up an application for equipment and spare parts, preparation of technical documentation and instructions for the operation and repair of equipment	5					v					v
46	Installation, testing and operation of technological machines	Fundamentals of wear and aging of technological machines and equipment, system of preventive maintenance of equipment, installation and operation of technological machines, methods and methods of monitoring and restoring machine parts. Basic calculations of technological lines with the choice of machinery and equipment; management of specific machines and devices; the rationale for assessing their technical and operational capabilities	7								v	v	v
47	Production management	Introduction to production management; basic principles of production management and personnel management; production management at the enterprise; main trends in improving production management in a market economy; rationalization of processes and methods of production management; production inventory management; production inventory management.	4	v		v						v	
48	Educational practice		2										
49	Production practice		17										
Cycle of profile disciplines Component of choice													
50	Thermal and refrigerating equipment 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.	3						v	v			
51	Thermal Engineering and Thermodynamics Basics	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	3						v	v			
52	Mechanics of liquid and gas	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	4					v		v			

		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 systems, pressure losses in them, device, principle of operation and purpose of various types of hydraulic machines, methods for calculating pumping units												
53	Pneumatic and hydraulic drives	Classification of hydropneumatic machines and drives; features of hydraulic and pneumatic systems; study of technological equipment using hydraulic and pneumatic drives; calculation of the main 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.	4						v	v	v			
54	Technological processes and apparatus of food production	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	5			v			v		v			
55	Technology of agricultural engineering	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.	5			v					v	v		