

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

M.Auezov SOUTH KAZAKHSTAN UNIVERSITY



D.h.s., academician Kozhamzharova D.P.

EDUCATION PROGRAMME

6B07271 - "Technology of pharmaceutical and perfumery and cosmetic products"

Registration number	
Code and classification of the field of education	6B07-Engineering, manufacturing and construction industries
Code and classification of training areas	6B072- Manufacturing and processing industries
Group of education programme	B072 Technology of pharmaceutical production
Type EP	Updated
ISCED level	6
NQF level	6
ORC level	6
Language of tuition	Russian
Typical duration of study	4 years
Form of study	Full time
The workload of the EP	240 credits
Distinctive features of EP	-
University partner (SOP)	-
University Partner (PDD)	-
Social Partner (DO)	-

Shymkent, 2021

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EP was considered by the Committee on innovative teaching technologies and methodological support of the Higher School of Chemical Engineering and Biotechnologies,

Protocol № 7 dated from «22» 02 2021

The chairman of the committee Aitkulova R.

It was considered and recommended for approval at the meeting of the Educational-methodical Council of M. Auezov SKU.

Protocol № 5 dated from «23» 02 2021

It was approved by the decision of the Academic Council of the University

Protocol № 12 dated from «25» 02 2021

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Introduction

1. Scope

Designed for the implementation of the training of bachelors in the educational program (hereinafter - EP) 6B07271 - "Technology of pharmaceutical and perfumery and cosmetic products" in RSE on right of economic management «M. Auezov South Kazakhstan State University» of RK MES.

2. Regulatory documents

The Law of the Republic of Kazakhstan "On Education" (with amendments and additions as of 04.07.2018);

Standard rules for the activities of educational organizations that implement educational programs of higher and (or) postgraduate education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated October 30, 2018 № 595 (registered with the Ministry of Justice of the Republic of Kazakhstan on October 31, 2018 № 17657);

State compulsory standards of higher and postgraduate education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 № 604;

The rules for organizing the educational process on credit technology of education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan dated April 20, 2011 № 152 with amendments and additions dated October 12, 2018 № 563;

The sectoral qualification framework "Chemical production" was approved by the minutes of the Meeting of sectoral commissions on social partnership and regulation of social and labor relations for the mining and metallurgical, chemical, construction industry and woodworking, light industry and mechanical engineering of August 16, 2016 № 1. As one of the economic activities, "Manufacturing of soaps and detergents, cleaning and polishing products, perfumes and cosmetics" is classified under this Industry Qualification Framework for the Chemical Manufacturing Industry.

The sectoral qualifications framework "Oil and gas, oil refining and petrochemical industries" was approved by the protocol of the Sectoral Commission on Social Partnership and Regulation of Social and Labor Relations in the Oil and Gas Industry dated March 30, 2017 № 1-2017.

The professional standard "Specialist in the production of perfumery and cosmetic products" was considered on the Eurasian technological platform "Technologies of the food and processing industry of the agro-industrial complex - healthy food products" (Association "TPPP APK") and approved by Order of the Ministry of Labor of Russia dated July 20, 2020 N 432n.

Professional standard: "Pharmaceutical activity" was approved by the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated October 22, 2018, № 285.

2. The concept of the educational program

The goal of the educational program is consistent with the mission of the university and is aimed at training the intellectual elite of the country with advanced knowledge, entrepreneurial skills, fluency in three languages, demonstrating conceptual, analytical and logical thinking skills, showing a creative approach in professional activities, capable of working in national and international teams, adopting the strategy of lifelong learning.

The educational program is harmonized with the 6th level of the National Qualifications Framework of the Republic of Kazakhstan, with Dublin descriptors, 1 cycle of the Framework for Qualification of the European Higher Education Area), also with the 6th level of the European Qualification Framework for Lifelong Learning.

The educational program is focused on professional and social order through the formation of professional competencies related to the necessary types of research, practical and entrepreneurial activities, adjusted taking into account the requirements of stakeholders.

The prospect of EP 6B07271 - "Technology of pharmaceutical and perfumery - cosmetic products" consists in the introduction of a new direction in the technology of perfumery and cosmetic products; integration of academic disciplines vertically and horizontally; implementation of continuity between basic and specialized disciplines with a practice-oriented approach to teaching. This EP is relevant for the oil refining and petrochemical industries, focused on the labor market through the availability of elective courses ordered by employers.

The attractiveness of the EP also lies in the fact that the products of the perfumery and cosmetic profile remain always in demand.

The educational program is aimed at achieving learning outcomes through the organization of the educational process using the principles of the Bologna process, student-centered learning, accessibility and inclusion.

The learning outcomes of the program are achieved through the following training activities:

- classroom lessons: lectures, seminars, practical and laboratory classes are conducted taking into account innovative teaching technologies, the use of the latest achievements of science, technology and information systems. Laboratory classes are carried out in accredited laboratories of the university: Testing regional laboratory of engineering profile "Structural and biochemical materials" and Laboratory of physical and chemical methods of analysis "SAPA", on the basis of educational, scientific and production complexes of Individual Entrepreneurship "Musaeva SA" and etc.

- extracurricular activities: independent work of a student, including under the guidance of a teacher, individual consultations;

- carrying out professional practices, the implementation of term papers and theses (projects) by order of enterprises.

The university has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination against students.

The quality of the EP is ensured by the involvement of stakeholders in its development and evaluation, systematic monitoring and review of its content.

Requirements for applicants are established in accordance with the Standard Rules for admission to training in an educational organization that implements educational programs of higher and postgraduate education order (MES RK No. 600 dated 31.10.2018)

1 PASSPORT OF THE EDUCATIONAL PROGRAM

1.1 The purpose and objectives of the educational program

The purpose of EP 6B07271 "Technology of pharmaceutical and perfumery - cosmetic products": fundamental training of bachelors for professional activities, able to solve production problems, to conduct design and research activities in the field of technology of petrochemical production and fine organic synthesis.

The tasks of the EP:

- Creation of conditions for the development of creative potential, initiative and innovation in the field of processing industries, students gaining basic knowledge for further training at higher levels of higher professional education

- Providing the trainee with knowledge, skills and competencies allowing to see, analyze and find ways to solve engineering problems in the field of petrochemistry and fine organic synthesis using modern technologies and the results of experimental research;

- Formation of spiritual and social consciousness, socially responsible behavior in society, understanding the importance of professional ethical standards and adherence to these standards;

- Training of a multilingual, highly qualified, competitive specialist with linguistic competence based on the parallel mastery of the Kazakh, Russian and English languages, mobile in the international educational space and in the labor market, capable of intercultural communication;

- Providing conditions for the formation of skills and abilities for entrepreneurship

1.2 List of qualifications and positions

The graduate of this EP is awarded the degree "Bachelor of Engineering and Technology".

Bachelors in EP "Technology of pharmaceutical and perfumery - cosmetic products" can work at enterprises for the production of pharmaceutical substances, perfumery - cosmetic and biotechnological products; at enterprises for the production of biologically active additives, medicinal and prophylactic drinks, sanitary and hygienic products and hold the positions of: pharmacist - cosmetologist, technologist, chemist-technologist, chemist-analyst, marketer, shift supervisor (by type of activity); shop manager, chief technologist, researcher (chemistry), research engineer, quality control engineer; manager of pharmaceutical production in accordance with the Industry Qualification Framework "Chemical Manufacturing", "Oil and gas, oil refining and petrochemical industries", Professional Standards.

1.3 Qualification characteristics of the graduate of the educational program

1.3.1 Scope of professional activity

The sphere of professional activity of a bachelor in the specialty 6B07271 "Technology of pharmaceutical and perfumery - cosmetics" is: pharmaceutical industry, perfumery and cosmetic, chemical, microbiological, biotechnological, food industry, science and education.

1.3.2 Objects of professional activity

The objects of professional activity of a bachelor in the specialty 6B07271 "Technology of pharmaceutical and perfumery - cosmetic products" are: pharmaceutical enterprises; enterprises for the production of medicines and medical products; biotechnological production, perfumery and cosmetic production; technical control departments; central plant laboratories; laboratories for standardization and quality control of medicines; management bodies for standardization, certification and licensing; research institutes; department of chemical and special profile.

1.3.3 Objects of professional activity

The subjects of professional activity of a bachelor in the specialty 6B07271 "Technology of pharmaceutical and perfumery - cosmetics" are: products of fine organic synthesis, apparatus and equipment of chemical and pharmaceutical technology; machines and machines for filling and packaging; perfumery and cosmetics, various types of raw materials and auxiliary materials and substances (including vegetable raw materials), chemical reagents, research instruments and equipment, educational and methodological documentation, regulatory and technical documentation and systems of standardization, certification.

1.3.4 Types of professional activities

- scientific research;
- production and technological;
- organizational and managerial;
- project;
- educational, pedagogical.

2. Learning outcomes for EP

LO1 Use information and digital technologies to solve professional problems, speak languages at a level that allows one to work in an international environment.

LO2 Use natural scientific, mathematical, social, economic and engineering knowledge, regulatory documents in professional activities.

LO3 Possess the methods of technical analysis and laboratory control of raw materials and finished products using instruments and analytical equipment, apply the requirements of standards and technical conditions for the development of formulations.

LO4 Know the methods of managing technological processes of processing natural and synthetic raw materials for the production of pharmaceutical, perfumery and cosmetic and detergents in accordance with the technological regulations in compliance with safety measures and labor protection standards.

LO5 Select and substantiate a rational production technology for pharmaceutical, perfumery and cosmetic and detergents based on the analysis of scientific and technical information, taking into account economic and environmental factors.

LO6 Possesses the skills of hardware and technological design, drawing up material and heat balances, calculating the main and auxiliary devices of the technological scheme for the production of pharmaceutical, perfumery-cosmetic and detergents.

LO7 Plan and conduct research for the development of compositions of compounds based on a deep understanding of colloidal-chemical processes at various interphase boundaries with the participation of surfactants, prepare scientific articles and reports, carry out comparative analyzes of theoretical and experimental data using methods of mathematical data processing.

LO8 Effectively work individually and as a team member, showing independence in solving production problems, using research, entrepreneurial skills, improve qualifications throughout life.

3. COMPETENCES OF EP GRADUATE

3.1 Successful completion of EP training contributes to the formation of the following competencies in the graduate:

- Core competencies (CC)
- Professional competence (PC).

Core competencies:

(CC1) in the field of *native and foreign languages*

- the ability to express and understand thoughts, feelings, facts and opinions in the professional field in written and oral forms;

(CC2) *fundamental mathematical, natural science and technical training*

- the ability and willingness to apply the educational potential, experience and personal qualities acquired during the study of mathematical, natural science, technical disciplines at the university and for solving professional problems.

(CC3) *computer*

- the ability to confidently and critically use modern information and digital technologies for work, leisure and communication, mastering the skills of using, recovering, evaluating, storing, producing, presenting and exchanging information through a computer, communicating and participating in cooperating networks with using the Internet in the field of professional activity;

(CC4) *social*

- the ability to understand social and ethical values based on public opinion, traditions, customs, norms and to be guided by them in their professional activities; be able to adequately navigate in various social situations; find compromises, correlate your opinion with the opinion of the team; know the norms of business ethics, ethical and legal standards of conduct; strive for professional and personal growth; work in a team, correctly defend your point of view, propose new solutions;

(CC5) *economic, entrepreneurial*

- the ability to know and understand the goals and methods of state regulation of the economy, the role of the public sector in the economy; possess the basics of economic knowledge; demonstrate entrepreneurial skills.

(CC6) cultural *training*

- the ability to know and understand the traditions and culture of the peoples of Kazakhstan, to be tolerant to the traditions and culture of other peoples of the world, to be aware of the attitudes of tolerant behavior; be not subject to prejudices, have high spiritual qualities.

(CC7) *additional competencies*

- the ability to master the skills of critical thinking, interpretation, creativity of analysis, drawing conclusions, assessment; have creativity and an active life position; make professional decisions in conditions of uncertainty and risk;

Professional competences:

PC1 *production and technological*

- the ability to carry out the technological process in accordance with the regulations and use technical means to measure the main parameters of the technological process, the properties of raw materials and products;

PC2 *organizational and management*

- the ability to organize the work of the team in the conditions of existing production; make managerial decisions in the field of work organization and implementation of environmental protection measures; systematize and summarize information on the formation and use of enterprise resources;

PC3 *research*

- the ability to study and analyze domestic and foreign scientific and technical literature; apply modern physical and chemical research methods, plan experimental research, receive, process and analyze the results obtained;

PC4 *design*

- willingness to participate in the design and modernization of individual stages of technological processes, equipment and installations using modern information technologies; design individual units of installations using automated application systems; draw up project documentation as part of the team of authors.

3.2 Matrix of correlation of EP learning outcomes in general with modules formed by competencies

	LO1	LO2	LO3 06	LO4 05	LO5 07	LO6 08	LO7 09	LO8 10
CC1	+				+			
CC2		+	+		+	+		
CC3	+	+			+	+		
CC4				+				+
CC5		+			+			+
CC6								+
CC7				+				+
PC1				+	+	+		+
PC2				+	+			+
PC3	+	+	+		+			
PC4		+			+	+		+

4. SUMMARY TABLE REFLECTING THE VOLUME ASSIMILATED CREDITS OF EDUCATION PROGRAM MODULES

Year of study	Semester / trimester	Number of master modules	Number of disciplines studied			Number of KZ credits				Total in hours	Total KZ credits	The number of	
			OC	UC	CC	Theoretical teaching	Study practice	Industrial / undergraduate practice	Final examination			Exam	Dif. exam
1	1/	5	5	2	-	30				900	30	6	1
	2/	4	4	2	2	28	2			900	30	5	3
2	3/	5	3	3	2	30				900	30	5	3
	4/	6	1	2	5	26		4/		900	30	4	3
3	5/	4		1	6	30				900	30	5	2
	6/	3		-	4	24		6/		900	30	4	1
4	/7	2			5	20				600	20	3	2
	/8	2			4	20				600	20	4	2
	/9	1		1				/8	12	600	20		1
Total		13	8	10	28	208	2	18	12	7200	240	36	18

5. Information about the disciplines

Name of module	CYCLE	HSC/E C	Component name	Short description of discipline	Credits quantity	Formed LO (codes)
Fundamentals of Public sciences	GED	OC	Contemporary History of Kazakhstan	Considers the classification, conceptual foundations of Domestic history, origins, continuity of the Kazakh statehood and actual problems of the history of modern Kazakhstan; the activities of the national intelligentsia ; creation of a democratic state of law. Forms a system of scientific views on the history of modern Kazakhstan society.	5	LO1, LO2
	GED	OC	Philosophy	Considers the foundations of the emergence of philosophy, identifies features of the emergence of a culture of thinking, reveals the concept of "philosophy", "worldview". Develops the skills of identifying the essence of the philosophical problem, critical thinking, the study of philosophical aspects, problems of practice and knowledge.	5	LO1, LO2
Module of Socio-Political Knowledge	GED	OC	Social and Political Studies	Considers the theory of sociology, social structure and stratification of society, the role and place of politics in society, the main stages of the formation and development of political science, reveals the essence of the state. Allows to develop the skills of sociological research, analysis of socio-political information.	4	LO1, LO2
	GED	OC	Cultural Studies and Psychology	Forms an understanding of the socio-ethical values of society in the systems of basic knowledge of the disciplines of the socio-cultural-psychological module. Instills the skills of formation of a program for solving conflict situations in society, including in a professional society; correctly express and defend their own opinions.	4	LO3, LO1
Socio-Ethnic Development Module	GED	HSC	Ecosystem and Law	Forms ideas about ecology as a science, about the relationship and interdependence of man and the environment. Considers the role of the state in market development, competition, demand, supply. Instills skills for calculating costs, revenue, turnover and capital turnover indicators; factors of competitiveness of market economy subjects. It instills the skills of analyzing the legality of events, the ability to refer to regulatory acts.	5	LO , LO4, LO5,
	BD	EC	Abai Studies	Examines the biography and works of Abai, creativity, his philosophical, aesthetic and social views, the history of the birth and formation of Abai studies; Develops skills of analytical reading of works of art, which implies a vision of the problems.	3	LO2, LO1
	BD	EC	Actual Problems and Modernization of Public Consciousness	Considers the concepts, forms, signs, features, value and main directions of modernization of public consciousness; concepts of competitiveness, pragmatism, national identity, evolutionary development, new ideology. Forms skills of preserving national identity, selfless service to the fatherland; openness of consciousness, readiness for change, openness and receptivity to the best world achievements.		LO1

			Muhtar Studies	Considers history of the formation and development of science " Muhtar studies ", the main dates of the life and creative activity of M. Auezov, the role and importance of the works of M. Auezov. Instills skills of searching and using information about the life and creativity of M. Auezov.		LO2, LO1
Communication and Physical Education module	GED	HSC	Kazakh (Russian) Language	Develops cognitive and communication skills in the Russian (Kazakh) language in the areas of interpersonal, social, intercultural communication. Instills the skills of discussing ethical, cultural, socially significant norms in discussions. Develops practical skills in interpreting text information, explaining their stylistic, genre specificity in various areas of communication.	10	LO1
	GED	HSC	Foreign Language	Develops cognitive and communication skills in a foreign language in the areas of interpersonal, social, intercultural communication; letters necessary for the preparation of thesis, annotations, abstracts and skills of written reasoned presentation of his own point of view to understand and use the language material in oral and written forms.	10	LO1
	GED	HSC	Physical Training	Forms the skills of using the means of physical culture and sports to increase their functional and motor abilities, to achieve professional goals; independent, methodically correct use of methods of physical education and health promotion. Grafts special applied psychophysical qualities for successful implementation in life and future profession.	8	LO8
	BD	HSC	Professional Kazakh (Russian) Language	Develops the skills of extracting the necessary information from the text, its interpretation in educational and professional communication. Develops the ability competently build communications, based on the goals and situation of communication. Forms ability to creativity, in process of building a program of speech behavior in the Russian (Kazakh) language.	3	LO1
	BD	HSC	Professionally Oriented Foreign Language	Instills skills in all kinds of speech activities necessary for oral communication in the field of professional activity; reading special literature with the extraction of professionally relevant information, business correspondence and documentation using modern means of communication, translation of information, writing various kinds of written works.	3	LO1, LO8
	GED	HSC	Information and Communication Technologies (in English)	Develops the ability to use information resources for searching and storing information, working with spreadsheets, working with databases. Forms skills in the use of methods and means of information protection; designing and creating websites, multimedia presentations; use of e-government and e-books, various cloud mobile technologies, management of SMART technologies.	5	LO4, LO5, LO6, LO8
Fundamentals of Engineering and Technical Sciences	BD	HSC	Higher Mathematics	Considers linear and vector algebra, analytic geometry; introduction to mathematical analysis; differential calculus of a single variable function; indefinite and definite integrals; application of the function of several variables, ordinary differential equations. Instills the skills of calculating the theory of	5	LO4, LO5, LO6, LO8

				series, the theory of probability, modeling of applied problems.		
	BD	HSC	Physics	Considers the kinematics and dynamics of a material point; conservation laws in mechanics, elements of continuum mechanics; mechanical vibrations and waves; molecular physics; thermodynamics; transfer phenomena; real gases, electrostatics; direct electric current, magnetic field phenomena, oscillations and waves, quantum physics, thermal radiation; elements of nuclear physics and quantum electronics.	4	LO4, LO5
	BD	EC	Applied Mechanics	Considers theoretical mechanics: statics axioms; bringing the system of forces to the simplest form; equilibrium conditions; point and solid kinematics; the dynamics of the material point and hardness; fundamentals of material resistance; types of deformation - stretching and compression, torsion, shear cut, complex deformation; criterion for designing machine parts.	4	LO1
			Mathematical Modeling of Chemical and Technological Processes	It considers the classification of mathematical models of chemical-technological processes, the development of deterministic, stochastic mathematical models of chemical-technological processes, methods of assessing the adequacy and optimization of mathematical-technological processes. Instills the skills of quantitative processing and interpretation of laboratory research results.		LO7, LO8
	BD	HSC	Engineering Computer Graphics	Considers the main positions of descriptive geometry, engineering graphics, the practical implementation of general technical and specialized drawings in accordance with GOST. It instills skills in working with modern computer programs in the AutoCAD computer-aided design environment, 3D modeling; reading technical drawings.	4	LO2, LO3, LO4, LO5
Chemical engineering	BD	HSC	General Chemistry	Considers the basic laws of chemistry; basic laws of chemical processes; classification and properties of chemical elements, substances and compounds; the purpose and scope of basic chemicals and their compounds. Instills skills of using the basic elementary methods of chemical research of substances and compounds.	4	LO2, LO3, LO4
	BD	EC	Physical and Colloid Chemistry	Forms knowledge of chemical thermodynamics, chemical equilibrium; properties of aqueous solutions, gases and electrolytes, methods for calculating phase equilibria; of surface phenomena and properties of dispersed systems and colloidal solutions. Instills the skills of calculating the basic parameters of the chemical process, making the choice of the optimal process parameters.	4	LO4, LO5, LO6, LO7
			Qualitative and Quantitative Analysis	Considers the main types of chemical reactions and processes in analytical chemistry; theory and chemical reactions; theory of titrimetric methods; main indicators; methods for expressing concentration of solutions. Forms the skills of choosing a method and carrying out chemical analysis, detection and identification of ions; preparation of solutions.		LO1, LO2, LO7, LO8
	BD	EC	Industrial Organic	Considers the composition, properties, methods of preparation and processing of	5	LO1, LO2,

		Chemistry	natural raw materials used in industrial organic chemistry; most important products of industrial organic synthesis . Forms skills of carrying out synthesis of products of industrial organic chemistry in laboratory conditions; cleaning and establishing the structure of organic compounds.		LO7, LO8
		Structure and Reactivity of Organic Molecules	Considers theoretical foundations of modern organic chemistry (composition, structure and chemical properties of organic compounds), the types of chemical reactions and conditions of their occurrence. Forms skills to identify the relationship between the structure of the compound and its chemical properties, the synthesis of organic compounds in the laboratory.		LO2, LO3, LO4, LO5
BD	EC	General Chemical Technology	Considers the main stages of chemical production, the criteria for the chemical production efficiency; theoretical foundations of chemical technology; basic laws chemical processes; operation principles of chemical reactors. Instills skills of calculating and analyzing balances of chemical-technological processes; use of basic kinetic parameters to describe the elements of technological schemes.	4	LO2, LO3, LO4, LO5
		Regularities of Technological Processes	Considers the general characteristics and classification of chemical-technological processes (CTH); CTH thermodynamic analysis; limitations in Le Chatelier's principle on pressure, temperature, and excess reagents; kinetics of homogeneous and heterogeneous chemical processes. Instills the skills of calculating the equilibrium composition of the reaction mixture; analysis of factors limiting chemical-technological processes.		LO4, LO5, LO6, LO7, LO3
BD	EC	Processes and Equipment of Chemical Technology	Considers the fundamentals of hydraulics, hydrodynamic processes and apparatus, thermal processes, mass transfer processes, the calculation and selection of apparatus and structures. Instills skills of carrying out material and energy calculations of processes and determining the optimal parameters for their management; performing design calculations of the main apparatuses.	4	LO4, LO5, LO6, LO7, LO3
		Heat and Mass Transfer Processes of Chemical Technology	Considers the mechanism of heat transfer and mass transfer processes, basic equation of the processes; design of the main types of heat and mass transfer equipment. Instills skills of calculating heat and mass transfer processes and determining the optimal parameters for their management; performing design calculations of the main apparatuses.		LO3, LO2, LO1, LO8
BD	EC	Engineering Economics and Entrepreneurship	Forms knowledge about types of economic systems and laws of the transition economy; essence and mechanism of a market economy functioning; the fundamentals of the supply theory and demand; business activities. Instills skills of creating your own business, doing business, drafting legal documents, developing a business plan.	4	LO6, LO7, LO8
		Organization of Production and	Considers the organization of the enterprise in market economic system; types of production, its technical and economic characteristics; production structure;		LO6, LO7, LO8

			Management	organization of technical control at the enterprise. Instills skills of developing and justifying various managerial decisions aimed at improving the efficiency of the enterprise and increasing productivity.		
	BD	EC	Standartization, Certification and Metrology	Considers the system of technical regulation, standardization, ensuring the uniformity of measurements, legislative and regulatory documents, standards. Instills skills of applying standardization methods, certification schemes, requirements of technical regulations, analysis of compliance with the requirements for standardization, certification; assessing the economic efficiency of work on standardization, certification, metrology.	4	LO4, LO5, LO7
	BD	EC	Biochemistry	Considers objects of biochemistry and research methods; main stages of modern biochemistry development as an independent science; the value of microorganisms in petroleum processing. Instills skills of conducting chemical analyzes for studying the properties and identification of important natural objects; use of instruments and laboratory equipment during biochemical studies.	4	LO1, LO2, LO8
			Introduction to Biopolymer Chemistry	Considers biopolymers as a class of high-molecular compounds and the level of their structural organization, based on ideas about structure, flexibility and submolecular structure of polymers; the interrelation of biopolymer chemistry with special disciplines in the chemical engineering field. Instills skills of conducting chemical analyzes to study the biopolymers properties		LO2, LO7, LO8
Fundamentals of Speciality	BD	EC	Introduction Specialty	Considers the rules of the educational process organization at the university, main components of educational process; information about educational program; history of the development of petroleum processing and petrochemistry of the Kazakhstan Republic ; basics of hydrocarbon processing technology. Forms knowledge of trends in the chemical engineering development .	4	LO2, LO8, LO6
			Fundamentals of Academic Writing	Russian and foreign languages in the academic sphere; develops students ' skills of pragmatic thinking based on the materials of the state, Russian and foreign languages, the ability to analyze variant units of the language and competently select the desired unit depending on the goals and conditions of communication.		LO2, LO8, LO6
	BD	HSC	Educational Practice	Fixes and deepens the obtained theoretical knowledge, skills and abilities in the chosen specialty; expands ideas about future professional activities. Introduces industry-specific production facilities, structure and technology, requirements for the quality of raw materials and products, with basic equipment and technology for the production of organic substances.	2	LO2, LO3, LO4, LO7
	BD	EC	Sanitary norms of perfumery and cosmetic products	Sanitary and epidemiological requirements for production and quality perfumes and cosmetics and means of hygiene of an oral cavity establishes requirements for the design, construction, water supply, Sewerage, lighting, ventilation, maintenance of premises, equipment of the objects of the production of perfumery and cosmetic products and hygiene of the oral cavity. Study of regulatory	5	LO2, LO7, LO6

				documentation of the Republic of Kazakhstan in this area.		
			Perfume and Cosmetics Safety Management System	Examines the system of updated standards for the safety management of perfumes and cosmetics: ISO certification systems: 9001-quality Management; 14001-Environmental management; 18001 – Professional safety and health. Develops skills in the use and development of regulatory documents for the management system of perfumery and cosmetics products		LO2, LO6, LO5
	ChD	HSC	Industrial Practice I	Fixes the theoretical knowledge of studied disciplines, applies them to make concrete decisions in production. Fixes skills of working with analytical equipment, instrumentation, current standards and specifications for raw materials and manufactured products in the laboratories of the scientific research institute and central laboratory of petroleum processing and petrochemical enterprises.	4	LO2, LO6, LO7
Fundamentals of Applied Sciences	BD	EC	Control Systems of Chemical-Technological Processes	Considers automation systems of the main technological objects, hierarchical process control systems; the structure of the automated control system, methods and methods of measuring the main technological parameters, automation systems of technological objects, synthesis of functional automation schemes; hierarchical process control systems. It instills the skills of reading typical schemes of automation of technological processes; economic justification of the choice of basic devices and automation devices.	4	LO2, LO6, LO7, LO3
			Automation of Production	Considers the basics of automatic regulation and control; purpose, purpose and functions of the automated process control system; automatic control; purpose of automatic control systems; functional schemes of automatic control systems; devices; automatic control of technological parameters; remote and telemechanical control and management; automation of production of petroleum products. Develops skills of using the latest information technologies to solve problems of automation of technological processes.		LO2, LO5, LO6, LO8
	BD	EC	Analytical Methods of Technical Practice	Considers the elemental and group compositions of raw materials (alcohols, essential oils, surfactants (SAM), etc.) to produce perfumes and cosmetics; methods of determining the structural-group composition of raw materials; modern methods of analysis of biologically active components; physico-chemical characteristics of plant materials, its equipment analysis. Instills working skills to analytical equipment, testing equipment, to standards and specifications of raw materials and manufactured products.	4	LO2, LO5, LO6, LO8
			Analytical Control of the Chemical Industry	Considers theoretical foundations of analytical control of production; metrology and standardization of analytical control; general guidelines to make technical analysis; basic elements and objects of environmental control of production; chemical, physical and physico-chemical methods of analysis. Instills the experience of choosing and conducting skills of technical analysis of organic substances, appropriate in perfumery products and cosmetology (beauty		LO2, LO5, LO6, LO8

				therapy).		
	ChD	EC	Fundamentals of Processing Plant Raw Materials	Considers physical and chemical foundations and general principles of plant materials processing; main properties of plant materials and factors affecting the quality of plant materials processing; prospects of plant materials use in the pharmaceutical and perfumery and cosmetic products production. Forms the skills of laboratory studies of plant materials.	6	LO2, LO5, LO6, LO8
			Fundamentals of Processing Synthetic Raw Materials	Considers physico-chemical basis of synthesis and synthetic raw materials processing: organic alcohols including polyols, polyethylene glycols, organic acids, synthetic gelling agents, petroleum products (paraffin, ceresin, petroleum jelly and perfume oil). Forms the skills of laboratory research of the synthesis and analysis of synthetic raw materials.		LO2, LO5, LO6, LO8
	ChD	HSC	Industrial Practice II	Fixed and deepens theoretical knowledge in practice. Introduces the real practical activity of the enterprise. Instills the skills of the technological process in accordance with the regulations and the use of technical means to measure the main parameters of the technological process, the properties of raw materials and products.	6	LO2, LO5, LO6, LO8
Fundamentals of Scientific Research	BD	EC	Planning and Statement of Scientific Research Works	Considers the methods of organization and planning of scientific research, modern methods and means of studying the properties and structures of materials; fundamentals of metrological support of measurements and statistical processing of results, rules of a scientific report, article and report's design. Develops the skills of independent planning and implementation of research, search and analysis of necessary information of the research theme.	5	LO1, LO8, LO5
			Fundamentals of Scientific Research and Patenting	Considers organization and stages of students' research work; metrological support of experimental studies; the experiment results processing; methods of graphical research results presentation; presentation of the research results; basics of patent science. Develops planning and conducting research skills, preparing scientific articles and reports, conducting comparative analysis of theoretical and experimental data, working in educational and scientific laboratories.		LO1, LO8, LO5
	ChD	EC	Equipment for the Production of Perfume and Cosmetic Products	Considers objects, general provisions and design features; methods and principles of technological production organization; mechanical calculations of devices' elements to produce pharmaceutical, perfumery and cosmetic products and detergents. Forms the skills of hardware process design, calculation and selection of the main devices of the technological scheme.	5	LO2, LO3, LO4
			Fundamentals of Design and Calculation of Equipment	Considers design problems and assessing criteria of structures quality; basic input data of the equipment development; equipment reliability; metal consumption and rigidity of structures; economic foundations of design; stages of the creating process or upgrading equipment; material selection. Instills the calculation skills and apparatus design to produce pharmaceutical and perfumery and cosmetic		LO4, LO5, LO7

				products.		
Fundamentals of Processing Plant and Synthetic Raw Materials and Quality Control	ChD	EC	Pharmacognosy	Considers medicinal plants and some primary processing products of plant and animal origin; their chemical composition, methods of isolating these substances from plants; rationing and standardization of medicinal plant materials. Forms the skills of search and analysis of new herbal medicines in order to expand the range and create effective pharmaceutical and cosmetic products.	5	LO4, LO5, LO7
			Chemistry of Hydrocarbons	Considers the experimental methods and theoretical foundations of hydrocarbon chemistry: the allocation of individual substances from plant, animal or fossil raw materials; synthesis and purification of hydrocarbon compounds; mechanisms of chemical reactions. Imparts skills in determining the structure of substances; identifies relationships between the structure of hydrocarbons and its properties.		LO4, LO5, LO7
	ChD	EC	Technology of Perfume Products	Considers the technology of perfume products manufacturing, the recipe calculation; aromatic substances as the aromatic basis of products, ethyl alcohol as a solvent for aromatic substances and disinfectants, dyes and excipients, technological processes to prepare perfumes. Instills practical skills in the perfumery products manufacture, the study of its properties in laboratory and industrial conditions	5	LO4, LO5, LO7, LO6
			Technology of Natural and Synthetic Scented Substances	Considers the composition and physico-chemical properties of natural and synthetic fragrances; theoretical foundations of preparing raw materials of processing, physical methods of various types separation of raw materials; liquid disperse systems; basic physical and chemical characteristics of the processes of processing natural and synthetic aromatic substances. Instills practical skills in the synthesis of natural and synthetic aromatic substances, the study of its properties in laboratory and industrial conditions		LO4, LO5, LO6, LO7
	ChD	EC	Technology of Cosmetics	Considers the production technology of cosmetic products - creams, gels, masks, tooth powders and pastes, hair care products, shampoos, balms, shower gels and liquid soaps, the classification of cosmetic products. Forms the skills of composing perfume formulations for cosmetics, cosmetics formulations, developing highly effective cosmetic products based on plant extracts, biologically active additives, healing mud and salts in the laboratory.	4	LO4, LO5, LO6
			Fundamentals of Preparation of Emulsions, Solutions and Dispersions	Considers the properties of disperse systems; osmotic pressure; diffusion; methods of preparation and purification of dispersed systems; kinetic and structural-mechanical, rheological and technological properties of disperse systems; surface phenomena; adsorption; aggregative stability, coagulation and electrical properties of disperse systems. Instills the skills of choosing methods to produce dispersed systems, researching its basic properties.		LO6, LO5, LO7, LO4
	BD	EC	Technology for Processing Raw	Examines the physical and chemical bases and General principles of raw material processing; the main properties of natural and synthetic raw materials and factors	4	LO4, LO5, LO6, LO7,

			Materials in the Production of Perfumes	affecting the quality of raw material processing in the production of perfumes; prospects for using new raw materials in the production of perfumes. Develops skills for conducting laboratory research of natural and synthetic raw materials.		LO3
			Fundamentals Technology of Biologically Active Compounds	Examines the physical and chemical basis for the synthesis and isolation of biologically active compounds, including organic acids, alkaloids, flavones, flavonoids, etc. Forms skills for laboratory research on the synthesis and isolation of natural biologically active compounds.		LO4, LO5, LO6, LO7, LO3
	BD	EC	Decorative Cosmetics Technology	Considers the theoretical foundations and production technology of decorative cosmetics, classification by: purpose and application areas, care of nails, hair, face area, the nature of the dispersed system, its action duration and form of release; features of manufacturing technology of decorative cosmetics. Instills the development skills of decorative cosmetics and the study of their properties.	4	LO4, LO5, LO6
			Technology of Fats	Considers the theoretical foundations and producing fats technology from plant and animal raw materials; production and use of fatty alcohols from synthetic hydrocarbon feedstocks; the use of fats in the perfumes and cosmetics manufacture. Forms the skills of conducting laboratory research to obtain the components of perfumery and cosmetic products from animal and vegetable fats and the properties of its study.		LO4, LO5, LO7, LO6
Technology of Pharmaceutical, Perfumery and Cosmetic Products	ChD	EC	Certification in Perfumery and Cosmetics	Considers the legal and regulatory framework of standardization and certification of perfumes, cosmetics and detergents, its nomenclature and properties, ways to improve its quality. Instills the conducting laboratory skills and analytical studies of pharmaceutical, perfumery and cosmetic products and detergents, according to known quality indicators, identifying ingredients of compliance according to one of those available in the product range.	4	LO2, LO1, LO3, LO4, LO5, LO6
			Examination of Perfumes and Cosmetics	Considers the objects and tasks of the perfumes and cosmetics examination (PCE); factors shaping the assortment and quality of PCE; quality requirements, quality indicators, assessment features and quality control, examination rules, identification and certification of PCE product subgroups; main regulatory documents in the quality and safety field of PCE. Forms the examination skills of perfumes and cosmetics.		LO2, LO1, LO3, LO4, LO5, LO6
	ChD	EC	Pharmaceutical Technology	Considers the theoretical foundations and production processes of the drugs processing into drugs by giving them a specific dosage form, the use of pharmaceutical technology in the cosmetics production with therapeutic and prophylactic purposes. Forms the skills to perform the necessary calculations of recipes and technology parameters; choosing the best option to prepare the dosage form and determining its quality in the laboratory.	4	LO4, LO5, LO6
			Technology for	Considers the physics and chemistry of surface-active substances (surfactants);		LO4, LO5,

			Production of Surfactants	micelle formation in surfactant solutions; phase behavior of concentrated surfactant systems; emulsion and emulsifiers; microemulsions. Instills the predicting skills and stability studying and physicochemical properties of surfactants.		LO6, LO7
	BD	EC	Technology of Production of Detergents	Considers the theoretical foundations and production processes of detergents, the classification of cosmetic detergents, the technology of synthetic detergents production, the use of surfactants in the detergents production. Develops skills in calculating detergent recipes and researching their properties.	4	LO4, LO5, LO6, LO7
			Chemical Technology of Soap Making	Considers raw materials for the soap production, chemical composition, manufacturing technology, soap classification and its quality indicators. Develops skills in the ingredients selection to the development of soap formulations, depending on the purpose and quality assessment of finished products in the laboratory.		LO4, LO5, LO6, LO7
	ChD	EC	Technology of Extraction Preparations	Considers the theoretical foundations and production processes of extraction of various substances, extraction and types of solvents are used to extract extracts of plant materials, factors affecting the extraction process of plant materials, extraction methods and equipment used. Forms skills in determining the concentration of ethyl alcohol, preparing tinctures and extracts.	4	LO4, LO8, LO6, LO7
			Deodorizing Cosmetics	Considers the characteristics, classification and mechanism of deodorizing agents; recipes and technologies to produce deodorizing agents of various forms release; assessment of the goods quality. Generates practical skills in analyzing and substantiating the formulation of deodorant cosmetics.		LO4, LO5, LO6, LO7
	BD	EC	Environmental Problems of Perfumery and Cosmetics Production	Considers the classification of wastes in the perfumes and cosmetics production, the harmful effects of perfumes and cosmetics on the environment and human health, the ways of utilizing production wastes, the principles of creating environmentally friendly perfumes and cosmetics. Instills the performing calculations skills of economic damage from environmental pollution by enterprises producing perfumes and cosmetics.	5	LO4, LO5, LO6
			Environmental Problems of Pharmaceutical Production	Considers the main environmental problems in the pharmaceuticals and plant materials production, ways of pharmaceutical waste recycling, the principles of green economy in the pharmaceuticals production. Develops performing calculations skills of economic damage from environmental pollution by pharmaceutical manufacturing enterprises.		LO4, LO5, LO6
	ChD	EC	Packaging Materials and Equipment	Considers modern types of perfumes and cosmetics packaging, the level and classification of packaging equipment, functional and technological schemes of the main packaging equipment types for perfumes and cosmetics. Forms the rational selection skills of materials to manufacture the package, taking into account the characteristics of technological processes and the purpose of	5	LO3, LO5, LO6, LO8

				products.		
			Nanocosmetics	Considers the current level of nanotechnology development and its usage in cosmetics, the features of nanotechnology to ensure the safety and effectiveness of cosmetics, the problems and prospects of nanotechnology development in the field of cosmetics development. Forms the search and analysis skills to improve the safety and effectiveness of cosmetics through the use of nanotechnology.		LO4, LO5, LO6, LO8
Module of New Professional Competencies Acquisition	BD	EC	Subjects on the Additional Educational Program	Protocol №6 dated 30.04.2021. The additional educational program (Minor) is a set of disciplines and (or) modules and other types of educational work, determined by students to study in order to form additional competencies.	12	LO8
Module of Final Attestation	ChD	HSC	Pre-degree or Industrial Practice	Fixes and deepens the theoretical knowledge, skills and abilities in the field of professional disciplines; forms the skills of practical experience in the specialty; collection and systematization of source materials for the diplomaproject (work).	8	LO1, LO2, LO4, LO5, LO6,
			Writing and Defending a Thesis, a Graduate Work, or Preparing and Passing a Comprehensive Exam	Forms practical skills for conducting an analytical review and patent search; independent choice of ways to improve existing technologies and technological processes; selection of activities for life safety, technical and economic assessment of the effectiveness and feasibility of work (project), presentation and protection of work (project).	12	LO1, LO2, LO4, LO7, LO8

APPROVAL SHEET

by educational program


6807271 - "Technology of Pharmaceutical, Perfumery and Cosmetic Products"

Director of DAI


signature

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Director of DAS


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Nazarbek U.B.

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