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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
M.O. AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

«APPROVED BY»
Chairman of the Board-Rector
Doctor of historical sciences, Academician
Kozhamzharova D.P.
«23» 02 2023

EDUCATIONAL PROGRAMME

6B07280 – «Technology Production and Processing of Polymers»

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 educational programs	B069 – Production of materials (glass, paper, plastic, wood)
Type of EP	new
ISCE level	6
NQF level	6
SQF of education level	6
Language of learning	Kazakh, Russian
The complexity of the EP, not less	240 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-

Shymkent, 2023

Devolopers:

Full name	Position	Signature
Sakibaeva S.A.	Candidate of Technical Sciences, Professor of the Department «Technology of inorganic and Petrochemical Industries»	
Mamytova G.Zh	Senior Lecturer of the Department «Technology of inorganic and Petrochemical Industries»	
Orazymbetova A.O.	Senior Lecturer of the Department «Technology of inorganic and Petrochemical Industries»	
Uakyn A.	Group CHT-21-12k	
Mamytov K.Zh	Chief Technologist LLP «AlmexPolymer»	
Ospanov I.N.	Deputy director LLP «Neftehymstroi-Yug»	
Massalova V.P.	Deputy director LLP «Eco - Shina»	
Alimbaev D.Dzh.	Director LLP «Triumf M.M.S.»	
Zholshibekov A.	Director of quality LLP "Hill Corporation"	

The EP was considered in the direction of training «Manufacturing and processing industries» at a meeting of the academic committee,
Minutes № 4 «17» 02 2023.

Chairman of the Committee _____ Erkebaeva S.U.

The EP was considered and recommended for approval at Educational and Methodical meeting of M. Auezov SKU,
Minutes № 4 «22» 02 2023.
Chairman of the EMC _____ R. Abisheva

The EP was approved by the decision of the Academic Council of the University, Minutes № 13 «23» 02 2023.

2

CONTENT

1.	Concept of the educational p.	4
2.	Passport of the program	6
3.	Competences of the EP graduate	8
3.1	Matrix of correlation of the EP learning outcomes in general with modules formed by competencies	9
4.	Matrix of the influence of modules and disciplines on the formation of learning outcomes and information on labor intensity	10
5	Summary table reflecting the volume assimilated credits of education program modules	48
6.	Learning strategies and methods, monitoring and evaluation	49
7	Educational and resource support of the EP	50
	Approval sheet	51
	Appendix 1. Review from the employer	
	Appendix 2. Expert opinion	

1 CONCEPT OF THE EDUCATIONAL PROGRAM

University Mission	Generation of new competencies, training of a leader who translates research and entrepreneurial thinking and culture**.**
University Values	• Openness–open to change, innovation and cooperation. • Creativity – generates ideas, develops them and turns them into values. • Academic freedom – free to choose, develop and act. • Partnership – creates trust and support in a relationship where everyone wins. • Social responsibility – ready to fulfill obligations, make decisions and be responsible for their results.
Graduate Model	• Deep subject knowledge, their application and continuous expansion in professional activity. • Information and digital literacy and mobility in rapidly changing conditions. • Research skills, creativity and emotional intelligence. • Entrepreneurship, independence and responsibility for their activities and well-being. • Global and national citizenship, tolerance to cultures and languages.
The uniqueness of the educational program	6B07280 - "Polymer production and processing technology" is basic for the petrochemical industry, it is orieted to the labor market through the availability of elective courses commissioned by employers of «Neftekhimstroy-Yug » LLC , «Ekoshina» LLC. 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 inclusivity.
Academic Integrity and Ethics Policy	The University has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination: • Rules of academic integrity (Minutes of the Academic Council № 3 dated 30.10.2018); • Anti-Corruption Standard (Order № 373 n/k dated 27.12.2019). • Code of Ethics (Protocol of the Academic Council № 8 dated 31.01.2020).
Regulatory and legal framework for the development of EP	1. Law of the Republic of Kazakhstan "On Education"; 2. Standard rules of activity of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated October 30, 2018, № 595 with amendments and additions dated December 29, 2021, № 614; 3. State obligatory standards of higher and postgraduate education, approved by the Order of the Ministry of Education and Science of the Republic of Kazakhstan dated July 20, 2022 № 2; 4. Rules for organizing the educational process on credit technology of education, approved by order of the Ministry of Education and Science of the Republic of Kazakhstan dated

	April 20, 2011 № 152; 5. Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated December 30, 2020 № 553. 6. Guidelines for the use of ECTS. 7. Guidelines for the development of educational programs for higher and postgraduate education, Appendix 1 to the order of the Director of the Center for the Bologna Process and Academic Mobility № 45 o / d dated June 30, 2021
Organization of the educational process	• Implementation of the principles of the Bologna Process • Student-centered learning • Availability • Inclusivity
Quality assurance of the Educational program	• Internal quality assurance system • Involvement of stakeholders in the development of the Educational Program and its evaluation • Systematic monitoring • Actualization of the content (updating)
Requirements for applicants	It is established according to the Model Rules for admission to training in educational organizations, implementing educational programs of higher and postgraduate education, Order of the Ministry of Education and Science of the Republic of Kazakhstan № 600 dated 31.10.2018
Conditions for the implementation of educational programs (EP) for persons with disabilities and special educational needs (SSN)	For students with SEN (special educational needs) and persons with disabilities (PSI), tactile PVC tiles, specially equipped toilets, a mnemonic diagram, and shower bars have been installed in educational buildings and student dormitories. Special parking spaces have been created. Crawler lift installed. There are desks for people with limited mobility (PLM), signs indicating the direction of movement, ramps. In the educational buildings (main building, building No. 8) there are 2 rooms with six working places adapted for users with disorders of the musculoskeletal system (DMS).For visually impaired users, the SARA™ CE Machine (2 pcs.) is available for scanning and reading books. The library website is adapted for the visually impaired. There is a special NVDA audio program with a service. The JIC website http://lib.ukgu.kz/ is open 24/7. An individual differentiated approach is provided for all types of classes and in the organization of the educational process.

2. PASSPORT of the program

Purpose of the EP	Prepare competitive bachelors who are able to solve production problems, conduct design and research activities in the field of technology for the production and processing of polymers, elastomers and paint materials.
Tasks of the EP	- providing the learner with knowledge, skills, and competencies that allow them to see, analyze, and find solutions to engineering problems in the field of technology for the production and processing of polymers, elastomers and paint materials using modern technologies and the results of experimental research; - to form a spiritual and social consciousness, socially responsible behavior in society, understanding the importance of professional ethical standards and following these standards; - training of a highly qualified, competitive multilingual specialist who has language competence based on parallel mastery of Kazakh, Russian and English languages, who is mobile in the international educational space and in the labor market, and who is capable of intercultural communication; - providing conditions for the formation of skills for business activities.
Harmonization of EP	• 6th level of the National Qualifications Framework of the Republic of Kazakhstan; • Dublin descriptors of the 6th level of qualification; • 1 cycle of a Framework for Qualification of the European Higher Education Area); • 6^{th} Level of European Qualification Framework for Life long Learning).
Connection of the EP with the professional sphere	• The sectoral qualifications framework "Petroleum and gas, petroleum processing and petrochemical industries" was approved by the protocol of the Sectoral commission on social partnership and regulation of social and labor relations of the petroleum and gas industry dated March 30, 2017 No. 1-2017 • The sectoral qualifications framework “Chemical Production” was approved by the protocol of the session of the sectoral commissions on social partnership and regulation of social and labor relations for mining and smelting, chemical, construction industry and woodworking, light industry and mechanical engineering of August 16, 2016 No.1.
Name of the degree awarded	After te successful completion of this EP, the graduate is awarded with degree of «Bachelor of Engineering and Technology on the Educational Program 6B07280 - Technology Production and Processing of Polymers».
List of qualifications and positions	Bachelors in OP 6B07280 - "Technology of polymer production and processing" can hold the following positions: process engineer, petrochemical engineer, chemical engineer, production preparation engineer, reservoir engineer, polymer production and processing engineer, production management engineer, quality control engineer; engineer (by type of activity); an engineer in production without presenting work experience requirements in accordance with the Industry Qualification Framework "Oil and gas, oil refining and petrochemical industries", "Chemical production".
Field of professional	There are enterprises for the production and processing of polymers,

activity	elastomers, paint and varnish materials, research and design industry institutes.
Objects of professional activity	The objects of professional activity are equipment, technological processes and industrial systems for obtaining substances, materials, and products, as well as the study of the scientific foundations of modern methods for obtaining polymers, the development of technical requirements for special-purpose polymer materials, as well as the study of the physical and chemical properties of polymers and modern methods for their evaluation.
Subjects of professional activity	Objects of professional activity are the products of basic and fine organic synthesis, apparatus and equipment for manufacture and processing of polymers, elastomers, coating materials, various types of raw and auxiliary materials, monomers, polymers, elastomers, chemicals and reagents, production of plastics and polymeric compositions, research facilities, devices and equipment, training documentation, technical training.
Types of professional activity	- industrial-technological; - organizational and management; - research; - design.
Learning outcomes	**LO1** Use various information resources and technologies in professional activities, communicate freely in the professional environment and society in Kazakh, Russian and English with an understanding of the culture and principles of academic integrity. **LO2** Demonstrate socio-cultural, professional development based on the formation of ideological, civic, spiritual and social responsibility, methods of scientific and experimental research. **LO3** Apply natural science, mathematical knowledge to solve engineering and scientific problems. **LO4** To carry out technological processes for the production and processing of polymers, elastomers and paint materials in accordance with technological regulations in compliabct with safety and labor protection standards. **LO5** Perform qualitative and quantitative analysis of raw materials and finished product using analytical equipment, control and measuring equipment. **LO6** Choose a rational technological scheme for the production of polymers, elastomers, paints and varnishes, talking into account economic and environmental factors. **LO7** Demonstrate the skills of drawing up material and thermal balances, calculating the main and auxiliary devices of the technological scheme for the production and processing of polymers, elastomers, paint and varnish materials. **LO8** Conduct scientific research and present the results of experimental data to the general public. **LO9** Have an active life position, entrepreneurial skills, improve skills throughout life.

3 COMPETENCES OF THE GRADUATE OF EP

Softskills. Behavioral skills and personality qualities

SS1. Competence in managing one's own literacy	SS1.1.The ability of self-learn, self-develop and constantly update their knowledge with in the chosen trajectory and in an interdisciplinary environment.
	SS1.2. The ability to express thoughts, feelings, facts and opinions in the professional field.
	SS1.3. The ability for mobility in the modern world and critical thinking.
SS 2. Language competence	SS2.1.The ability to build communication programs in the state, Russian and foreign languages.
	SS2.2. The ability for interpersonal social and professional communication in the conditions of intercultural communication.
SS 3. Mathematical Competence and Competence in the field of Science	SS3.1.The ability and will increase applications potential, experience and personal qualities acquired during hospitalization natural sciences, technical disciplines at the university to solve professional problems.
SS 4. Digital competence, technologicall iteracy	SS4.1. The ability to demonstrate and develop information literacy through the mastery and use of modern information and communication technologies in all areas of their lives and professional activities.
	SS4.2. The ability to use various types of information and communication technologies: Internet resources, cloud and mobile services for searching, storing, protecting and disseminating information.
SS 5. Personal, social and academic competencies	SS5.1.The ability for physical self-improvement and focus on a healthy lifestyle to ensure full-fledged social and professional activities through the methods and means of physical culture.
	SS5.2. The aility to social and cultural development based on the manifestation of citizenship and morality.
	SS5.3 The ability to build a personal educational trajectory throughout life for self-development, career growth and professional success.
	SS5.4. The ability to successfully interact in a variety of socio-cultural contexts during study, work, home and leisure.
SS 6. Entrepreneurialcompetence	SS6.1. The ability to be creative and entrepreneurial in a variety of environments.
	SS6.2. The ability to work in a mode of uncertainty and rapidly changing task conditions, make decisions, allocate resources and manage your time.
	SS6.3. The ability to work with consumer requests.
SS 7. Culturalawarenessandabilitytoexpressyourself	SS7.1. The ability to show world view, civil and moral positions.
	SS7.2. The ability to be tolerant of the traditions and culture of other peoples of the world, to have high spiritual qualities.

Professional competencies (HARD SKILLS).

Theoretical knowledge and practical skills specific to this field	PC1 ndustrial-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, properties of raw materials and products; PC2 organizational and management - the ability to organize the work of the team in the current production conditions; make management decisions in the field of labor organization and implementation of environmental 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
- readiness to participate in the design and modernization of individual stages of technological processes, equipment and installations using modern information technologies; to design individual units of installations using automated application systems; to issue project documentation as part of the author's team.

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

	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**
SS1	+							+	
SS 2		+			+		+	+	
SS 3	+	+					+	+	
SS 4			+						+
SS 5		+				+			+
SS 6			+						+
SS 7				+					+
PS1				+		+	+		+
PS2				+		+			+
PS3	+	+			+				
PS4		+				+	+		+

4 MATRIX OF THE INFLUENCE OF MODULES AND DISCIPLINES ON THE FORMATION OF LEARNING OUTCOMES AND INFORMATION ON LABOR INTENSITY

№	Наименование модуля	цикл	компонент	Наименование дисциплины	Краткоеописаниедисциплины	Кол-во кредитов	Формируемыерезультатыобучения(коды)								
							РО1	РО2	РО3	РО4	РО5	РО6	РО7	РО8	РО9
1	Fundamentals of public sciences	GED	ОС	History of Kazakhstan	The goal is to form an objective view of the history of Kazakhstan based on a deep understanding and scientific analysis of the main stages, patterns of historical development of Kazakhstan. Contents: Ancient people and the formation of a nomadic civilization. The Turkic civilization and the Great Steppe. Kazakh Khanate. Kazakhstan in the era of modern times. Kazakhstan is part of the Soviet administrative and command system. Independence of Kazakhstan. The state system, socio-political development, foreign policy and international relations.	5		+							
2		GED	ОС	Philosophy	The goal is to form students' holistic understanding of philosophy as a special form of cognition of the world, its main sections, problems and methods of their study in the context of future professional activity. Content:The subject and method of philosophy. Fundamentals of philosophical understanding of the world. Genesis. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. Human philosophy and the world of values. Ethics. The philosophy of values. The subject of aesthetics as a field of philosophical knowledge. Society and culture. Philosophy of history. Philosophy of religion.	5		+							

					"Mangilik El" and "Modernization of public consciousness" are a new Kazakh philosophy.										
3	Socio-political knowledge	GED	OC	Sociology and Political Science	The goal is to form knowledge about socio-political activities, explain socio-political processes and phenomena. Content: Social and ethical values of societies. Features of social, political, cultural, psychological institutions in the context of their role in the modernization of Kazakh society. Making decisions to resolve conflict situations in society, including in professional society. Research of political institutions and processes, methods of analysis and interpretation of ideas about politics, government, the state and civil society, to understand and apply methods and techniques of sociological, comparative analysis, to understand the essence and content of the political situation in the modern world.	4		+							
4		GED	OC	Cultural Studies and Psychology	The goal is to introduce students to universal cultural, artistic and moral values, expand their horizons, develop erudition. Content: Culture as a social phenomenon. The history of cultural thought. Culture of different times and peoples. Political, economic, national culture. The subject of the problem and methods of psychology. The specifics of psychological research. The structure of the psyche. Personality, behavior, activity Psychology of communication. Psychology of cognitive processes. Individual personality traits.	4		+							
5	Socio-Ethnic Develop-ment	GED	HSC	Ecosystem and Law	The goal is to form integrated knowledge in the field of economics, law, anti-corruption culture, ecology and life safety, entrepreneurship, research methods. Contents: Fundamentals of safe interaction	5		+		+		+			

					between man and nature, productivity of ecosystems and the biosphere. Entrepreneurial activity in conditions of limited resources, increasing the competitiveness of business and the national economy. Regulation of relations in the field of ecology and human life safety. Knowledge and compliance with Kazakhstan law, obligations and guarantees of subjects, state regulation of public relations to ensure social progress. Application of scientific research methods.										
6		BD	EC	Abay Studies	The goal is to preserve the "national code" in the Kazakhtanu project based on the creativity of A.Kunanbayev Contents: Historical overview of the history of Kazakhstan and Kazakh literature of the XIX-XX centuries. Studies of Abai's legacy of the XX-XXI century. Chronology of Abai's creativity. Abai is a great poet, ethnographer, founder of Kazakh written literature. Abai is the compiler of the code of laws "The Position of Karamola", social significance. Abai is a thinker, religious scholar, philosopher. The role of Abai in education and science, the concept of a "Holistic person". "Words of Edification" by Abai, an epic novel by M.Auyezova "The Way of Abai". K. Tokaev "Abai and Kazakhstan in the XXI century", role, significance.	3		+							
7		BD	EC	Actual Problems and Modernization of National Awareness	The goal is to restore spirituality, deformed in the periods of tsarist and Soviet reality, the formation of a creative personality based on the modernization of the public consciousness of young people. Contents: Spiritual modernization: origin and prerequisites. Modern national identity.			+							

					Pragmatism and competitiveness. National identity and national code. Experience and prospects of evolutionary development. The triumph of knowledge and openness of consciousness. Alphabet reform: experience and priorities. The motherland is the foundation of the state.Education through national sacred places and history.Modern Kazakh culture is the cornerstone of spiritual revival.New humanitarian education and the future national intelligentsia. Abai Kunanbayev and the Kazakh society.										
8		BD	EC	Mukhtar Studies	The goal is the formation of knowledge and thinking by learning by deepening their understanding of the work of M. Auezov. Contents: The history of the formation and development of the science of "Mukhtar studies", the main dates of M. Auezov's life and creative activity, the role and significance of M.Auezov's works in Kazakh literature. The life and creative activity of the writer M.Auezov. Formation of the science of Mukhtar studies. Scientists who have studied the science of Mukhtar studies. Scientific works on the work of M.Auezov. The early works of M.Auezov, the Stories of M.Auezov in 20-30 years. ("Korgansyzdyn kuni", "Zhetim", "Eskilik kulenkesinde", "Barymta" T.B.) Gray Fierce" is a classic of Kazakh literature. The epic "The Way of Abai" is an encyclopedia of folk life. The system of images in the epic "The Way of Abai". Essays on the life and work of M.Auezov. M.Auezov is a classic of Kazakh literature			+							

9		BD	EC	Service to Society	The goal is to form an active life position among students by making proposals to solve specific problems of society. Content: The concept and meaning of "Servicelearning". The history of the formation and development of the concept of "ServiceLearning". Key components of "ServiceLearning". Socially useful activities in the children's and youth environment. Organization of the volunteer movement in the world and Kazakhstan practice. The profile focus of Service Learning. Domestic practice of teaching through socially useful activities. Technologies of social design. Preparation of social projects, their analysis and discussion. Implementation of the action plan. Making a portfolio. Preparation and protection of the project. Reflection and further promotion of the social project.			+							
10		BD	EC	Foundations of Anticorruption Culture	The goal is to form an anti-corruption worldview, strong moral foundations of personality, civic position, stable skills of anti-corruption behavior. Content: Overcoming legal nihilism, formation of the foundations of the legal culture of students in the field of anti-corruption legislation. Formation of a conscious perception, attitude to corruption. Moral rejection of corrupt behavior, corrupt morality, ethics. Mastering the skills necessary to counter corruption. Creating an anti-corruption standard of conduct. Anti-corruption propaganda, dissemination of ideas of legality, respect for the law. Activities aimed at understanding the nature of corruption, awareness of social losses from its		+	+							

					manifestations, the ability to defend one's position in a reasoned manner, to look for ways to overcome manifestations of corruption.										
11	Communication and Physical Training Module/	GED	OC	Kazakh (Russian) Language	The goal is to form communicative competence using the Kazakh (Russian) language in the socio-cultural, professional sphere and public life, improving the ability to write academic texts. Content: Levels A1, A2, B1, B2-1, B2-2 (B2, C1 Russian) are presented in the form of cognitive- linguistic-cultural complexes consisting of spheres, topics, subtemes and typical communication situations of international standard: social, social, cultural, educational and professional, modeled forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts of the educational program, possession of terminology and the development of critical thinking.	10	+								
12		GED	OC	Foreign language к	The goal is to form the intercultural and communicative competence of students in the process of foreign language education at a sufficient level A2 and the level of basic sufficiency B1. The student reaches the level B2 of the pan-European competence if there is a language level at the start above the level B1 of the pan-European competence Content: Levels A1, A2, B1, B2 are presented in the form of cognitive - linguoculturological complexes consisting of spheres, topics, subtemes and typical situations of communication of international standard: socio-household, socio-cultural, educational	10	+								

					and professional, modeled forms: oral and written communication, written speech works, listening. Demonstration of understanding of the language material in the texts of the educational program, possession of terminology and the development of critical thinking.										
13		GED	OC	Physical Training	Purpose: formation of social and personal competencies and the ability to purposefully use the means and methods of physical culture that ensure the preservation and strengthening of health in preparation for professional activity; to withstand physical exertion, neuropsychic stresses and adverse factors in future work. Content: Implementation of physical culture and health and training programs. A complex of general development and special exercises. Sports (gymnastics, sports, athletics, etc.). Control and self-control during classes, insurance and self-insurance. Judging competitions. Means of professionally applied physical training. Modern wellness systems.	8	+								
14		BD	HsC	Professional Kazakh (Russian) Language	The goal is to provide professionally-oriented language training for a specialist who is able to adequately build communication in professionally significant situations and who knows the norms of the language for special purposes. Content: Professional language and its components. Professional terminology as the main feature of scientific style. Scientific vocabulary and scientific constructions in the educational and professional and scientific and professional spheres. The algorithm of work	3	+								

					on the analysis and production of scientific texts in the specialty. Production of scientific and professional texts. Fundamentals of business communication and documentation in the framework of future professional activity.										
15		BD	HSC	Professionally-Oriented Foreign Language	The goal is to achieve the linguistic and communicative competence necessary for foreign language activities to study and creatively comprehend foreign experience in the profile and related fields of science and technology. Content. Types of speech activity necessary for oral communication in the field of professional activity; reading special literature and periodical materials with the extraction of professionally relevant information, business correspondence and documentation with the use of modern means of communication, translating information in the specialty from a foreign language, writing various kinds of written works in a professionally oriented field.	3	+								
16		GED	OC	Information and Communication Technologies	The goal is to develop the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, ways of collecting and transmitting information through digital technologies. Development of new "digital" thinking, acquisition of knowledge and skills of using modern information and communication technologies in various activities. Contents: Introduction and architecture of computer systems. Software. Operating systems. Human interaction with computers. Database systems. Database management.	5	+								

					Networks and telecommunications. Cyber defense. Internet technologies. Cloud and mobile technologies. Multimedia technologies. Smart technologies. Electronic technologies. Electronic business. Electronic control.										
17	Основы инженерно-технических наук	BD	HSC	Higher Mathematics	Purpose: formation of theoretical knowledge on the basics of analytical geometry, linear algebra, differential and integral calculus, knowledge of probability theory and statistics underlying mathematical models, phenomena and processes. Contents: Functions of several variables. Partial derivatives of the first order. Full differential. Higher-order derivatives. The extremum of a function of several variables. Tangent plane and normal to the surface. Differential equations of the first order. The Cauchy problem. Homogeneous equations. Linear differential equations. The Bernoulli equation. Higher-order differential equations. Homogeneous and inhomogeneous differential equations. Numerical series. Convergence and sum of the series. A sign of Leibniz. Functional series. Power series.	5			+						
18		BD	HSC	Physics	The goal is to form ideas about the fundamental laws of classical and modern physics and the skills of their application in chemical engineering, the development of scientific thinking based on an interdisciplinary approach. Content:The laws of classical and modern physics (mechanics, molecular physics, thermodynamics, electromagnetism, optics, quantum and atomic physics). Application of knowledge of physical phenomena and	5			+						

					processes to solve applied and technical problems. Scientific research methods, methods of processing and analyzing the results of theoretical and experimental studies.										
19		BD	EC	Applied Mechanics	The goal is to master the general principles and modern methods of calculating the strength of typical elements of machines and structures for using the knowledge gained in practical activities when solving professional tasks. Content:Introduction. The main provisions of the resistance of materials. Stretching-compression. Geometric characteristics of cross sections. Shear and torsion. Bend. Theories of strength. Stability of compressed rods. Fundamentals of mechanism analysis. Mechanical transmissions. Drive. Shafts and axles. Shaft and axle supports. Fundamentals of the design of parts and assemblies of mechanisms.	4			+						
20		BD	EC	Mathematical modeling of chemical-technological processes	Purpose: formation of students' knowledge about the main criteria of mathematical modeling and creation of mathematical models of objects of various nature with their help. Contents: Modeling methods and their applications, structural schemes of chemical technology objects, principles and stages of mathematical model construction, mathematical description of chemical transformation processes (kinetic models); processes of substance movement (hydrodynamic models); mathematical model as a basis for optimization of technological processes. Analysis of the efficiency of chemical production.				+						

21		BD	HSC	Engineering Computer Graphics	The goal is to form knowledge, skills and abilities sufficient to compile engineering and design documentation using AutoCAD. Content: Projection. A point and a straight line. The plane. Axonometric projections. Geometric surfaces and bodies. Basic information on the graphic design of drawings. Views, sections and sections in drawings. Methods of connecting parts. Threaded products. Execution of sketches of parts. Compilation and design, reading and detailing of assembly drawings and general drawings. Initial setup. Shutdown and save images. Building a drawing of a flat shape. Building drawings of parts. Image editing. Building a three-dimensional model of an object	4			+				+		
22	Chemical engineering	BD	HSC	General Chemistry	Purpose: students gain theoretical knowledge in key sections of general chemistry and acquire skills in performing laboratory work. Contents: Basic concepts and laws of chemistry. Atomic and molecular theory, the structure of matter, general patterns of chemical processes, chemical processes in solutions, chemical bonding and the structure of molecules. Chemical and physical properties of elements and their basic compounds. Chemical kinetics. Thermodynamics. Water and aqueous solutions. Solutions of electrolytes. Redox reactions. Electrochemical processes.	4			+						
23		BD	EC	Physical and Colloid Chemistry	The goal is the formation of knowledge on the basics of physical and colloidal chemistry and the formation of a theoretical foundation for the study of specialized disciplines. Contents: Laws of thermodynamics and thermodynamic potentials. Chemical	4			+						

					equilibrium. Phase equilibrium and solutions. Electrochemistry. Chemical kinetics and catalysis. Chemical kinetics and catalysis. Dispersed systems, thermodynamics of surface phenomena. Adsorption. Electrical properties of dispersed systems, stability and coagulation.										
24		BD	EC	Qualitative and Quantitative Analysis	Purpose: formation of students' skills in the study of the qualitative and quantitative composition of the substance. Content: Qualitative analysis. Analytical reactions and methods and conditions for their implementation. Fractional and systematic analysis. Acid-basic classification of cations. Classification of anions based on precipitation reactions. Quantitative analysis. Gravimetric (weight) method of analysis. Methods of titrimetric analysis. Methods of redox titration. Methods of complexometric titration. Physico-chemical methods of analysis.					+			+		
25		BD	EC	Industrial Organic Chemistry	The goal is to form students' holistic understanding of organic chemistry as the science of organic compounds and methods of their industrial production. Contents: The main provisions of the theory of the structure of organic compounds. The raw material base of the organic synthesis industry. High-molecular compounds. Synthetic detergents. medicinal products. Synthetic dyes. Organic solvents and technical liquids. Synthetic scented and flavoring substances. Methods of isolation and purification of organic compounds.	5			+						
26		BD	EC	Structure and Reactivity of Organic	The goal is to form students' in-depth knowledge in the field of the influence of structural factors on the behavior of reacting				+						

				Compounds	systems, ideas about the features of the mechanisms of reactions. Contents: The concept of the reaction mechanism. Methods of establishing mechanisms. reactions. Reactivity: structural and solvation effects. Catalysis. Synchronous processes. Nucleophilic substitution in the aliphatic series. Elimination reactions. Electrophilic and nucleophilic substitution in aromatic systems. Electrophilic connection by multiple bonds. Nucleophilic attachment to C =O multiple bond. Reactions of free radical substitution.											
27		BD	EC	General Chemical Technology	Objective: to form students' knowledge about the scientific foundations and physico-chemical laws of chemical and technological processes, the analysis of HTS models, the choice of the optimal technological scheme of production with the rational use of raw materials and fuel and energy resources. Contents: The main stages of chemical production, criteria for the effectiveness of chemical production; theoretical foundations of chemical technology; basic laws of homogeneous, heterogeneous and heterogeneous-catalytic chemical processes; principles of operation of chemical reactors. Calculation and analysis of material and thermal balances of chemical and technological processes; basic kinetic parameters for describing elements of technological schemes.	4			+							
28		BD	EC	Regularities of Technological Processes	Objective: to form students' knowledge about the scientific foundations and typical patterns of chemical and technological processes, the choice of optimal technological modes of				+							

					production with the rational use of raw materials and fuel and energy resources. Contents: General characteristics and classification of chemical and technological processes; thermodynamic analysis of HTS; limitations in the Le Chatelier principle on pressure, temperature and excess of reagents; kinetics of homogeneous and heterogeneous chemical processes, areas of flow, methods of intensification of heterogeneous processes in various areas of flow. Calculation of the equilibrium compositions of the reaction mixture; analysis of factors limiting chemical and technological processes.											
29		BD	EC	Processes and Equipment of Chemical Technology	Purpose: formation of students' knowledge about the theoretical foundations of the processes of chemical, petrochemical, oil refining technology. Content:Fundamentals of hydraulics, hydrodynamic processes and apparatuses, thermal processes, mass transfer processes, calculation and selection of apparatuses and structures; comparative analysis of the operation of devices, finding optimal conditions for technological processes. Material and energy calculation of processes and determination of optimal parameters of their management; design calculations of the main devices.	4			+							
30		BD	EC	Heat and Mass Transfer Processes of Chemical Technology	Purpose: formation of students' knowledge about the main heat and mass transfer processes in chemical, petrochemical, oil refining technology. Contents: The mechanism of transfer of heat and mass transfer processes, the basic equation of processes; the design of the main				+							

					types of heat and mass transfer equipment; material and thermal balances of drying, crystallization and dissolution. Calculations of heat and mass transfer processes and determination of optimal parameters of their management; design calculations of the main devices.										
31		BD	EC	Engineering Economics and Entrepreneurship	The goal is to form students' fundamental theoretical knowledge about the basic economic laws and competencies necessary for practical engineering and management activities at oil and gas processing enterprises in market conditions. Content: characteristics of the development of the economy of the Republic of Kazakhstan and its state regulation. Types of economic systems and patterns of transition economy. The essence and mechanism of functioning of the market economy. Fundamentals of the theory of supply and demand. Entrepreneurial activity. Development of entrepreneurship in the Republic of Kazakhstan within the framework of the services market. Creating your own business. Conducting commercial activities. Drafting of legal documents. Development of a business plan.	4						+			+

32		BD	EC	Organization of Production and Management	Purpose: formation of students' theoretical knowledge and practical skills in the economic justification of management decisions, the study of the fundamental principles of organization, planning and management of production. Content: Organization of the enterprise in the market system of management; types of production, its technical and economic characteristics; production structure; organization of technical control at the enterprise; management of technical preparation of production; essence, functions and methods of production management. Development and justification of various management decisions aimed at improving the efficiency of the enterprise, productivity growth.							+			+

33		BD	HSC	Standardization, Certification and Metrology	The goal is to form theoretical knowledge and practical skills in the field of standardization, certification and metrology to solve problems of ensuring the uniformity of measurements and quality control of products, services and works in their professional activities. Content: Objects of standardization, certification and metrology. Legislative and regulatory-technical base of standardization systems, technical regulation, metrology and conformity assessment. General scientific and special methods of standardization. Certification and declaration schemes. Methods and types of measurements. Calculation of measurement errors and uncertainties. The technical basis of metrology. The role of international management systems in improving the competitiveness of enterprises..	4					+				
34		BD	EC	Biochemistry	The goal is to form knowledge about the structure and properties of chemical compounds in living organisms, about the laws of biochemical processes and mechanisms of regulation of metabolism. Contents: Proteins, properties and functions. Enzymes, properties and functions. Nucleic acids, properties and functions. Carbohydrates, classification and functions. Biological significance of lipids. Vitamins. Carbohydrate metabolism. Anaerobic and aerobic breakdown of carbohydrates. The exchange of proteins and amino acids.	4			+						
35		BD	EC	Introduction to biopolymers Chemistry	Objective: to form students' fundamental knowledge about the chemical composition and structure, physico-chemical and biological properties of natural polymer compounds.				+						

					Contents: Physico-chemical structure of biopolymers and basic chemical reactions. Color reactions. Methods of research and recognition of biopolymers. Physiologically active and neutral polymers. Inert polymers. Requirements for polymer materials. Packaging materials based on biopolymers. Ecological features of the use of biopolymers. Biopolymers of the future.										
36	Fundamentals of Specialty	BD	EC	Introduction Specialty	Purpose: formation of theoretical knowledge and practical skills in the field of polymer production and processing technology for future bachelors, development of interest in the chosen profession. Content: The rules of the educational process organization at the university, the main components of the educational process; information about the educational program; the history of the development of the Republic of Kazakhstan; The basics of technology for obtaining and processing functional polymer materials with a given set of properties. Modern technological methods and equipment for the production of products from polymer composite materials. Areas of application of polymer composite materials.	4	+	+							
37		BD	EC	Fundamentals of acadimic writing	The goal is to develop students' skills in writing academic texts, such as abstracts, essays, annotations, literature reviews, etc., skills in creating and editing reports and presentations, and skills in correctly compiling bibliographic descriptions. Content: Features of scientific discourse: style and genres of academic texts; work on an academic text at the university. The structure of scientific written work. The wording of the		+							+	

					topic. Quoting works of other authors. Plagiarism. A logical presentation of your own idea. Logical connectives. Terms, concepts, definitions. Features of scientific vocabulary. Writing and registration of scientific work. Requirements for the design of texts of scientific papers. Scientific report and presentation. Abstract and abstract of the scientific work.										
38				Educational Practice	The goal is to consolidate and deepen the acquired theoretical knowledge, skills and abilities according to the chosen educational program; to expand the idea of future professional activity. Contents: Educational and laboratory base of the department, its structure, scientific and pedagogical staff, history, graduates, traditions. The main directions of research work of the department, master's degree, doctoral studies, student scientific society, educational and scientific research work of students. Safety precautions in the chemical laboratory. Implementation of educational and research work of students on the chosen topic. Methods of synthesis and analysis of raw materials and polymer. Excursion to the profile enterprise: the mode of operation of the enterprise; the main and auxiliary workshops of the enterprise, their purpose and technological process.	1	+				+				
39		BD	EC	Theoretical Basics of Polymer Processing	The goal is to form the skills of the correct choice and implementation of the method of processing polymer material. Content: Theoretical foundations of polymer processing. The nature of polymers and the mechanism of structure formation in the processing processes. The strength of polymers.	5				+		+			

					Theoretical foundations of surface phenomena of polymer materials. Physico-chemical bases of polymer processing. Rheological properties of polymer melts. Mixing. Extrusion. Injection molding. The main characteristics of polymer processing on roller machines. Analysis of the formation of composites based on reactive oligomers.										
40		BD	EC	Rheology in Polymer Refining Processes /	The aim is to form knowledge about the rheology of polymer systems, the characteristic features of the behavior of polymers in the process of viscous flow Contents: Basic axioms and concepts of polymer rheology. Patterns of viscous flow of polymers. Development of models for the flow of polymer melts in channels of circular and rectangular cross-sections. The main regularities of the flow of polymer bodies in rotary viscometers. Methods of investigation of rheological properties of polymers. Capillary and rotational viscometry. Viscoelastic properties of polymers. Viscoelastic properties of polymers. The concept of elastic turbulence of the polymer melt.					+		+			
41	Fundamentals of Applied Sciences/	BD	EC	Control Systems of Chemical-Technological Processes	Purpose: formation of students' knowledge in the field of the theory of automatic control and operation of control systems for chemical and technological processes. Content: Automation systems of the main technological objects, hierarchical process control systems; the structure of the automated process control system, methods and methods of measuring the main technological parameters, automation systems of	4				+					

					technological objects, synthesis of functional automation schemes; hierarchical process control systems. Economic justification of the choice of basic devices and automation devices.											
42		BD	EC	Automation of Production	Purpose: formation of students' knowledge about methodological, technical automation tools, including general principles of building automated systems for industrial purposes. Contents: Fundamentals of automatic regulation and control. Purpose, purpose and functions of the automated control system. Automatic control. Purpose of automatic control systems. Functional schemes of automatic control systems. Instrumentation. Automatic control of technological parameters. Remote and telemechanical control and management. Automation of polymer production and processing.					+					
43		BD	EC	Analytical Methods of Technical Practice	Purpose: formation of students' knowledge on the theoretical foundations of chemical analysis. Contents: Elemental and group compositions of monomers, polymers. Methods for determining the structural and group composition of high-molecular compounds. Modern methods of analysis of polymer materials. Analytical equipment, control and measuring equipment, standards and specifications for raw materials and manufactured products. Environmental control of production; chemical, physical and physico-chemical methods of analysis.	4					+					
44		BD	EC	Analytical Control of the Chemical	Purpose: formation of students' knowledge about physical and physico-chemical methods of analysis, analytical control of technological						+					

				Industry	processes, automatic control. Contents: General information about technical analysis at the enterprise. Types of technical analysis, classification, frequency. Input control of raw materials and materials. Technical analysis as a quality management tool. Regulatory and technical documentation State standards and regulations in the field of polymer materials science and polymer testing. The most important classes of polymers. The main physico-chemical methods used in technical analysis. IR spectroscopy. NMR spectroscopy. X-ray diffraction and X-ray phase analysis. UV spectroscopy. Gel chromatography of polymers. Mass spectrometry and EPR spectroscopy. Thermographic analysis.										
45		ChD	EC	Chemistry and Physics of High-molecular Compounds	The goal is to form practical skills of synthesis, modification, research of physico-chemical properties and structure of polymers. Contents: Basic concepts and definitions in chemistry and physics of high-molecular compounds. Methods for obtaining high-molecular compounds. Radical polymerization. Ionic polymerization. Copolymerization Stepwise synthesis methods. Technical methods of polymerization and software-licondensation. Chemical properties and chemical transformations of polymers. Intermolecular interaction and supramolecular structure of polymers. Aggregate and phase states of polymers. Physical states of polymers. Properties of crystalline polymers. Oriented structures of crystalline and amorphous polymers of Macromolecules and their behavior in solutions.	6			+	+					

46		ChD	EC	Colloidal Chemistry of Polymers	The purpose is to reveal the essence of processes and surface phenomena occurring in polymer–based colloidal systems. Content: Dispersion of colloidal polymer systems. Methods for determining the dispersed composition of polymers. Surface and interfacial tension in dispersed polymer systems. Surface-active properties of polymers and the effect of surfactants on the properties of polymer systems. Adsorption and adhesion of polymers Rheological properties of binary systems. Solidification of solutions and jelly polymers. Polymer jellies as dispersed colloidal systems. Emulsions, dispersions and foams of polymers Colloidal-chemical properties of polymer dispersions. Dispersion polymerization in organic media. Fundamentals of polymer composites.			+				+			
47				Industrial Practice I	The goal is to consolidate the knowledge gained by students in the process of studying at a higher educational institution on the basis of an in–depth study of the work of the enterprise, institution and organization in which students practice. Contents: A brief history and prospects of the company. The structure of the laboratories of the Research Institute. The structure of the central factory laboratory of the enterprise. Types of laboratory quality control of raw materials and finished products. commodity analysis laboratory, machine room, research laboratory. Analytical equipment, control and measuring equipment, current standards and specifications for raw materials and manufactured products in the laboratories of research institutes and research centers of	4				+	+				

					enterprises for the production and processing of polymers.										
48	Fundamentals of Scientific Research	ChD	EC	Planning and Statement of Scientific Research Works	The goal is to form a system of knowledge among students about the basics of organizing scientific research, about the basic principles of planning, conducting, and processing the results of scientific research. Content: Methods of working with scientific literature and processing scientific information. Patent search. Assessment of the relevance of the research topic. Choosing the direction of scientific research on oil research. Selection of methods of physico-chemical research of polymers. Setting goals and objectives of scientific research in the production of polymers. Rules for registration of research results.	5								+	
49		ChD	EC	Fundamentals of Scientific Research and Patenting	The goal is to develop students' skills for independent, engineering, creative and research work. Contents: Classification of sciences. Methodological foundations of scientific knowledge. Research work of students (R&D), its organization and stages. Experimental studies. Classification, types and tasks of the experiment. Metrological support of experimental studies. Registration of R&D results. Discoveries and inventions, forms of their protection. Description and formula of the invention. The main provisions of the patent laws of the Republic of Kazakhstan and the countries of the far and near abroad. Patent documentation and its use. Development of search regulations. Specifics and organization of scientific research..									+	

50		ChD	EC	Fundamentals of Design and Equipment of Enterprises for the Production and Processing of Polymers	The goal is to form knowledge about the design of polymer processing enterprises, standard equipment for the production of polymers and their processing into products. Contents: Equipment for pretreatment of polymers and chemicals. Closed faucets. Roller machines and lines based on them. Extrusion equipment and lines based on it. Injection molding machines. Machines for tableting press materials. Hydraulic presses. Blow-out units. Production of products based on fiberglass. Machines for thermoforming sheet and film thermoplastics. Vulcanization equipment. Vehicles. Fundamentals of enterprise design in the production of polymer products.	6							+		
51		ChD	EC	Fundamentals of Designing and Equipment of Petrochemical Plants	The purpose is to familiarize with the principles and fundamentals of the design of enterprises and equipment of NHZ, design documentation, modern engineering methods of equipment calculations; compilation of material and thermal balances of chemical and technological processes. Contents: The main stages and initial data for the design of the NHZ. Design and estimate documentation. Raw materials and schemes of NHZ. Calculation and compilation of material balances of production and schemes of material flows of NHZ. The initial data for the design of the technological part of the project and the principles of building technological schemes. Classification of equipment and technological processes. Factors affecting the design of chemical reactors. Calculation and design of devices. Design of systems of the general factory								+		

					economy of the NHZ.										
52	Polymer Materials Science	BD	EC	Polymerization Polymer Technology	The goal is to form a complex of knowledge about the basic physico-chemical and macrokinetic laws of polymerization processes. Contents: Physico-chemical bases of polymerization methods of polymer synthesis. Technology of polymerization polymers. Polyethylene: raw materials, production of polyethylene at different pressures, structure, properties and applications of polyethylene. Polypropylene: preparation, structure, properties, applications. Polyvinyl chloride: the main and additional raw materials, methods of production, structure and properties, applications. Polyvinylidene chloride: raw materials and their preparation, structure and properties, production. PET: receipt, properties. Polystyrene: raw materials, methods for producing polystyrene, structure and properties, impact-resistant and heat-resistant polystyrene. PVA- receipt, properties.	5				+					
53		BD	EC	Chemistry of Hydrocarbons	Purpose: formation of skills for determining the structure of substances; identification of dependencies between the structure of hydrocarbons and their properties. Contents: Structure, properties, reactivity and methods of obtaining hydrocarbons: limiting, ethylene, acetylene, diene, etc. Structure, properties, reactivity and methods of obtaining monofunctional derivatives of hydrocarbons. Structure, properties, reactivity and methods of obtaining bi- and polyfunctional derivatives of hydrocarbons. Spectral and other instrumental methods for the study of organic				+			+			

					compounds.										
54		BD	EC	Polycondensation Polymer Technology	The aim is to develop practical skills in the synthesis and research of the physico-chemical properties of polycondensation polymers in laboratory and industrial conditions. Content: Characteristics of the features of the synthesis of polycondensation polymers. Methods for obtaining polycondensation polymers: in melt, in solution, at the interface of phases and in the solid phase. Production technology, properties and application of heterochain polyesters. Production technology, properties and application of epoxy oligomers and plastics based on them. Production technology, properties and application of phenol-aldehyde oligomers and plastic mass based on them. Production technology, properties and application of aminoaldehyde oligomers and plastics based on them.	5				+		+			
55		BD	EC	Technology of rubber products	The goal is the formation of knowledge about the laws of processing rubbers into rubber products; skills in the selection and calculation of formulations of products for a specific purpose and the study of their properties. Content: Features of rubber products manufacturing technologies. The main materials used in the production of rubber products. Promising reinforcing materials, industries. Modern pneumatic tires. Molding and vulcanization of tires. Production of rubber technical products and consumer goods. Methods of manufacturing sleeves of various designs. Molded rubber technical products. Non-standard rubber technical					+		+			

					products. Manufacture of latex products, technology features. Manufacture of shoes made of polymer materials.										
56		ChD	EC	Technology Processing and Use of Plastics	The purpose is to study the methods of plastics processing, methods of regulating the properties of polymers in products, mastering the knowledge of process control. Contents: Classification of plastic processing methods. Extrusion. Injection molding of thermoplastics. Manufacture of hollow products by blowing. Molding of products from sheet thermoplastic materials. rotary molding, pressing. injection molding of reactoplasts. Rolling and calendering. Molding of products made of reinforced plastics. Special methods of plastics processing: welding, gluing and mechanical processing of products.	4				+		+			
57		ChD	EC	Polymer Materials Science	The goal is to develop skills for analyzing and comparing the properties of compositions by parameters, choosing the composition of the material, taking into account the design features of the product, its manufacturing technology, and the operating conditions of the products. Content: Composition, structure and structure of polymer materials. Classification and nomenclature of polymer materials. Commodity forms of polymers. The main ingredients of plastics, their purpose and requirements for them. Identification of polymer materials. Technical and technological properties of polymer materials. Thermoplastic and thermosetting polymers. Natural polymers. Cellulose esters and esters, Elastomers.				+		+				

					Rubbers. Rubber. Thermoplastics. Foams. Paint and varnish materials. Polymer composites. Physico-chemical principles. designing new materials. Diagnostics of materials.										
58				Industrial Practice II	The goal is to consolidate, deepen and systematize the knowledge gained during the study of theoretical special disciplines at a university at a particular enterprise or organization, as well as to obtain primary production experience. Contents: General principles of the organization of the enterprise, its history, development prospects, significant indicators. The purpose and operation of the main and auxiliary workshops, the flow chart of the plant, the quality of refined oil and the range of commercial products.General factory farm. Hardware and technical design of technological processes. Typical machines and apparatuses in workshops (reactors, injection molding machines, extruders, absorbers, etc.). Familiarization with one of the workshops, its structure and place in the production scheme of the plant.).	6				+					
59		ChD	EC	Physical and Mechanical Testing of Plastics	The goal is to develop the skills of conducting physical and mechanical tests of plastics. Content: Physical and mechanical properties of plastics. Standard test methods. International Organizations for Standardization (ISO and ASTM). Existing international standards in the field of plastic testing methods. The relationship of loading conditions of polymers and products made of them with their mechanical behavior and mechanical properties. Structural and optical	4				+					

					properties of polymers. Thermophysical properties: determination of specific heat capacity, determination of linear thermal expansion coefficient and glass transition/melting temperature. Mechanical properties: Hardness and strength tests Tensile and bending tests. Rheological properties Viscosity, fluidity, volume change rate.										
60		ChD	EC	Recycling of Polymers	The purpose is to familiarize students with the methods of recycling waste polymer materials, the formation of the analysis and selection of the method of recycling polymer materials Content: Problems of polymer recycling. Waste classification The main methods of waste disposal of all types. Processes of mechanical recycling. Washing, cleaning, drying and transportation. Shredding of waste polymer materials. Compaction and agglomeration. Classification (fractionation) waste polymer materials. Granulation of secondary polymer materials. Modification of recycled plastics. Recycling of polymer materials. Processing of elastomeric compositions. Waste disposal. The economics of recycling.						+			
61		ChD	EC	Chemistry and Technology of Synthetic Fibers	The goal is to form knowledge about the physico-chemical bases of obtaining fiber-forming polymers; methods of obtaining chemical fibers and technology of forming polymer fibers and filaments. Content: General information about chemical fibers. Classification of chemical fibers. Methods of obtaining chemical fibers. Viscose fibers. Production of viscose. Molding of viscose fiber. Acetate fibers. Production of cellulose acetates. Forming of acetate fiber.	4				+					

					Copper-ammonia fibers. Polyamide fibers. Preparation of polycaproamide. Molding of nylon fibers. Polyester fibers. Production of polyethylene terephthalate. Molding of polyester fibers. Polyacrylonitrile fibers. Production of polyacrylonitrile. Forming of polyacrylonitrile fibers. Polyvinyl chloride polyvinyl alcohol fibers.										
62		ChD	EC	Chemistry and Technology of Synthetic Rubber	The purpose is to familiarize with the main scientific and technical problems and development prospects in the field of chemistry and technology of synthetic rubber production. Content: The production of synthetic rubbers (SC) is the main branch of petrochemical production. Types of synthetic rubbers. Classification by the method of obtaining. General and special purpose rubbers. Technological properties of rubbers and rubber mixtures. Isoprene rubbers. Types and properties of butadiene rubbers Butadiene rubbers. Butadiene-styrene rubbers. Ethylene-propylene rubbers. Butyl rubber .Polyisobutylene. Butadiene-nitrile rubbers. Chloroprene rubbers. Fluoro-rubber. Acrylate rubbers. Siloxane rubbers. Polysulfide rubbers. Urethane rubbers					+					
63	Polymer Composite Materials	ChD	EC	Basics of the Design of Plastic Products and Forming Tooling	The goal is to acquire students theoretical and practical skills in the selection and justification of plastics for specific products and technological equipment for their manufacture. Content: The design process. The main elements of the design of products made of polymer materials. Structural design. Fundamentals of strength calculation of plastic products. Design of structural elements of	4			+				+		

					plastic products. Fundamentals of calculation and design of tooling for the production of plastic products. Molds for injection molding. Calculation of cooling systems. A system for removing castings from the mold. Calculation of the ejection force of castings. Molds for pressing. Equipment for inflatable molding. Equipment for pneumatic vacuum molding.										
64		ChD	EC	Calculation and Design of Rubber Products	The purpose is to study the basics of designing and calculating pneumatic tires, rubber products (RP) and technological equipment. Content: Features of rubber as a structural material. The main requirements for rubber, depending on the operating conditions. Features of relaxation properties of rubber. Calculated dependences between stress and strain in these types of loading. Properties and features of rubber in dynamic loading and in structures. The endurance of rubber to repeated deformations. Designs of modern pneumatic tires. Performance characteristics of tires. Design of automobile tires. Design of the main parameters of technological equipment. Drive belts. Conveyor belts. Sleeves. Rubber parts and seals.					+		+			
65		ChD	EC	Chemistry and Technology of Paint and Varnish Materials and Coatings	The goal is to acquire students' knowledge in the field of chemistry and technology of paint and varnish materials and polymer coatings, allowing them to solve practical problems. Content: The range of materials for obtaining polymer coatings. Development of the coating composition. Methods for evaluating operational properties. Adhesive joints. Strength and deformation properties. Methods of application and curing of paint coatings. Classification of methods for	5				+		+			

					applying and curing coatings; methods for applying liquid and powder paints; thermal curing; curing coatings obtained from powder paints. Equipment for preparing the surface of products for painting Equipment for applying liquid and powder paint materials. Coating curing equipment.										
66		ChD	EC	Technology of Tire Production	The purpose is to study by students the design of tires for various purposes, , features of the formulation and manufacturing technology of rubbers for tires of various types and purposes, technological. Contents: Raw materials and materials for and dropping children tires.Reinforcing materials. Preparation of cord and fabrics. Impregnation and processing of cord and fabrics.Trimming of cord and fabrics on calenders.Construction of massive and pneumatic niches. Manufacture of diagonal car tires. Production of tires with a radial arrangement of cord threads. Massive tires.Manufacture of car cameras and rim tapes.Final tire manufacturing operations. Restoration repair of pneumatic tires. Principles of construction of formulations of tire rubbers.					+		+			
67		BD	EC	Water Soluble Polymers	The purpose is to study the features of their structure and physico-chemical properties, to acquire the skills of experimental work in the field of synthesis of water-soluble synthetic polymers. Contents: General information and classification of water-soluble polymers. Production of artificial water-soluble polymers. Practical significance of water-soluble and water-swelling polymers. The main methods of synthesis of water-soluble polymers based on acrylamide: radical	4				+	+				

					polymerization of acrylamide in solution, in mass, emulsion and suspension. Features of polymerization methods. Properties of the obtained polymers and technical and economic indicators of production. Homogeneous and heterogeneous polymerization. Chemical properties of polyacrylamide and its derivatives. Physical and physico-chemical properties of polymers of acrylamide and substituted acrylamides and their application.										
68		BD	EC	Biodegradable Polymers	The aim is to obtain theoretical knowledge about the classification of biodegradable polymers, methods and technologies of production, mechanisms of biodegradation and methods of its research; Contents: Classification of biodegradable polymers (used) by type of raw materials. Used polymers from natural raw materials of plant and animal origin. Biodegradable polymers from natural raw materials of bacterial origin. Biodegradable synthetic polymers from biomonomers. Biodegradable synthetic polymers from hydrocarbon raw materials. Biodegradable artificial polymers (chemically modified polymers). Biodegradable composite materials based on natural and synthetic polymers. Biodegradable artificial polymers (chemically modified polymers).Biodegradable polymers for medical purposes.					+	+				
69		ChD	EC	Polymer Composite Material	The goal is to form the skills of choosing the types of binder and filler, product molding modes, selection of auxiliary materials, determination of physical, mechanical and operational properties of PCM.	4				+		+			

					Contents: General idea of composite materials. Classification, features of the structure and properties of composite materials. Methods of obtaining. Areas of application. Fillers and reinforcing elements PCM. The main types of binders for PCM. Structure and properties of PCM. Composite materials with metal and ceramic matrix (microns microns). Elastomeric materials and products made of them. Spatially reinforced composite materials. Nanostructured composite materials. Composites with functional layers. Sandwich designs.										
70		ChD	EC	Modified Polymer Materials	The purpose of the formation of skills for obtaining modified polymer materials with various modifying additives, determining their physical and mechanical properties in laboratory conditions Contents: Modification of polymers Modification of polymers. Chemical transformations of polymers. The main modifiers and their effect. Non-binding modifiers. Binding modifiers. Gain stimulators. Chemical type modifiers. Functionalized polymers . Low molecular weight substances. Structural modification of physical and mechanical properties. Filled polymers. Modification of physico-mechanical and technological properties of polymers by functional fillers. Modification of secondary polymers. Identification methods polymer materials.							+		+	
71		ChD	EC	Recycling and Utilization of Polymer Wastes	The goal is to form a system of knowledge about the possibility and ways of recycling and recycling of polymer waste. Content: Analysis of the state of recycling of polymer materials. Sources of polymer waste. Isolation of polymers from household waste. Methods of disposal of polymer waste. Recycling of polymers .Methods of pretreatment of polymer waste. Separation of polymer	5						+		+	

					mixtures into individual components. Features of secondary polymers. Recycling of secondary polymers in the product. The use of recycled polymers. Chemical processing of polymer waste. Extraction of energy from waste plastics. Creation of environmentally friendly polymer materials.										
72		ChD	EC	Ecology and Environmental Protection of Polymer Enterprises /	The goal is the formation of systematic knowledge in the field of ecology of production and use of polymer materials. Contents: Environmental problems related to the functioning of polymer production enterprises. The use of polymer composite materials in industry. Technological and environmental problems in the production of raw materials and ways to solve them. water-soluble polymers, their properties and environmental problems in the field and ways to solve them. Assessment of environmental reliability of polymer materials (PM) Methods of control of low molecular weight substances released from PM Sanitary and chemical analysis of PM in liquid media. Features of sanitary chemical analysis of PM in the air.						+			
73		ChD	EC	Polymeric Materials in Construction	The goal is to form students' knowledge about polymer materials used in construction. Contents: History and development trends of building polymer materials. Materials and products based on polymers. Basic properties of polymers as building materials. Toxicity and other negative properties of polymer materials. Physico-chemical bases of production of polymer building materials. The main and auxiliary quality indicators of polymer materials and	5				+					

					factors affecting quality indicators.										
74		ChD	EC	Polymers in Medicine	The goal is to form students' knowledge about polymer materials used in medicine Content:Requirements for polymers in medicine. Parameters for assessing the impact of high-molecular compounds on human health; the relationship of chemical compounds. The relationship of physico-chemical parameters of polymer compounds with their biological activity. Industrial polymers. Bioinert polymers. Biocompatible polymers. The use of polymers in various fields of medicine. The use of polymer medicinal films. Medical threads. Gluing of fabrics.Microcapsulation. Polymers of directed biological action. Blood and plasma substitutes. Prolongators.Polymer medicinal substances. Polymers for the creation of new dosage forms.					+					
75	Module of New Professional Competencies Acquisition	BD	EC	Subjects on the Additional Educational Program	Purpose: formation of additional competencies that ensure the competitiveness of students in the domestic and international labor market; the possibility of working or forming a related industry on the labor market at the border of two educational programs – the main (Major) and additional (Minor). Content: A set of disciplines and (or) modules and other types of academic work chosen by the student for study. Protocol No. 6 of 30.04.2021.	12										+
76	Module of Final Certification			Pre-degree or Industrial Practice	The goal is to consolidate the theoretical knowledge gained in the study of disciplines; in-depth study of the technology of production and processing of polymers, the acquisition of practical skills and competencies in the field of professional activity.	10				+	+			+	

					Contents: Characteristics of raw materials processed at the plant and methods of its transportation at the plant; assortment of products manufactured by the enterprise; flow diagram of the plant; technological scheme of the installation, its hardware design, technological regulations of the installation (material balance of the installation, mode of operation of devices and devices); the main equipment of the installation with an automation scheme and instrumentation, with an appropriate description of the devices and means of regulation. Norms and requirements of safety regulations and firefighting equipment										
77				Writing and Defending a Thesis, a Graduate Work, or Preparing and Passing a Comprehensive Exam	**Goal -** systematization, generalization and consolidation of theoretical knowledge, practical skills and competencies of the future bachelor. **Content: Graduation project.** Literary review. The choice of the production method and the place of its construction. Characteristics of raw materials, reagents and finished products. Description of the technological scheme of the process being developed and its distinctive features. The material balance of the projected process. Technological calculations of the main devices. Mechanical calculation. Selection of main and auxiliary equipment. Analytical control of production. Elements of research work**.** **Graduate work.** Annotation. Literary review. Justification of the choice of research direction and their purpose. Experimental installation and instructions for its operation. Methods of conducting research and processing experimental data. Research results, their discussion. The material balance of the projected process. Technological calculations of the main unit or unit of the installation.	8						+			+

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

Course of Study	Semester/Trimester	The number of mastered modules	The number of studied disciplines			Number of KZ credits					Total hours	Total KZ credits	The number of	
			OC	HSC	EC	Theoretical training	Physical Training	Educational practice	Industrial/ Pre-diploma practice	Final examination			exam	dif. Credits
1	1/	5	4	2	1	28	2				900	30	6	1
	2/	5	2	1	2	27	2	1			900	30	4	4
2	3/	5	3	3	1	28	2				900	30	6	2
	4/	6		1	4	24	2		4/		900	30	4	3
3	5/	4		1	6	30					900	30	5	2
	6/	4		-	4	24			6/		900	30	4	1
4	/7	3			5	21					630	21	3	2
	/8	2			4	21					630	21	4	2
	/9	1							/10	8	540	18		1
Total		13	9	8	27	203	8	1	20	8	7200	240	36	18

6 LEARNING STRATEGIES AND METHODS, MONITORING AND EVALUATION

Learning strategies	Student–centered learning: The student is the center of teaching/learning and an active participant in the learning and decision-making process. Practice-oriented training: orientation to the development of practical skills.
Teaching methods	Conducting lectures, seminars, various types of practices with: • the use of innovative technologies: • problem-based learning; • case study; • work in a group and creative groups; • discussions and dialogues, intellectual games, olympiads, quizzes; • reflection methods, projects, benchmarking; • Bloom's taxonomies; • presentations; • rational and creative use of information sources: • multimedia training programs; • electronic textbooks; • digital resources. Organization of independent work of students, individual consultations.
Monitoring and evaluation of the achievability of learning outcomes	**Current control** on each topic of the discipline, control of knowledge in classroom and extracurricular classes (according to syllabus). Assessment forms: • survey in the classroom; • testing on the topics of the discipline; • * control works; • protection of independent creative works; • discussions; • trainings; • colloquiums; • essays, etc. **Boundary control** at least twice during one academic period within the framework of one academic discipline. Intermediate certification is carried out in accordance with the working curriculum, academic calendar. Forms of holding: • exam in the form of testing; • oral exam; • written exam; • combined exam; • project protection; • protection of practice reports. **Final state certification.**

7. EDUCATIONAL AND RESOURCE SUPPORT OF THE EP

Information Resource Center	The structure of the JRC has 6 subscriptions, 16 reading rooms, 2 electronic resource centers (ERC). The basis of the network infrastructure of the OIC consists of 180 computers with Internet access, 110 automated workstations, 6 interactive whiteboards, 2 video doubles, 1 videoconferencing system, 3 scanners of A-4 format, 3. The software of the OIC – AIBS "IRBIS-64" for MSWindows (a basic set of 6 modules), an autonomous server for uninterrupted operation in the IRBIS system. The library fund is reflected in the electronic catalog available to users on the website http://lib.ukgu .kz is on-line 24 hours 7 days a week. Thematic databases of their own generation have been created: "Almamater", "Works of scientists of SKSU", "Electronic Archive".Online access from any device 24/7 via an external linkhttp://articles.ukgu.kz/ru/pps. Working with catalogs in electronic form. The EC consists of 9 databases: "Books", "Articles", "Periodicals", "Works of the teaching staff of SKSU", "Rare books", "Electronic Fund", "SKSU in print", "Readers" of "SKU". The JIC provides its users with 3 options for accessing its own electronic information resources: from the Electronic Catalog terminals in the catalog hall and divisions of the JIC; through the university's information network for faculties and departments; remotely on the library's website http://lib.ukgu.kz /. Access to international and republican resources is open: "SpringerLink", "Envoy", "Web of Science", "EVSSO", "Epigraph", to electronic versions of scientific journals in open access, "Zan", "RMEB", "Adebiet", Digital library "Akpigress", "Smart-kitar", "Kitar.kz", etc. For people with special needs and disabilities, the library's website has been adapted to the work of visually impaired users in the JRC.
Material and technical base	The department has all the necessary conditions for conducting fundamental, applied, research, development work, as well as for innovative activities. The material and technical base of the Department "Technology of inorganic and Petrochemical Industries" includes 7 laboratories: "7 laboratories: "Petrochemical synthesis" (213B) "Research of petroleum products" (214B), laboratory of undergraduates and doctoral students (216B), "Research of petroleum and petroleum products" (414B), scientific laboratory "Petrochemistry and polymer composite materials"(418B), "Destructive processes of oil refining, petroleum products and physico-mechanical testing of elastomers" (121A), "Elastomer technology" (123A), Also, teachers and students have the opportunity to conduct research in certified laboratories of the University "SAPA" and "IRLIP". The laboratories are equipped with modern equipment and devices, which allows the educational process to keep up with the times

APPROVAL SHEET

on the Educational program
6B07280 – «Technology of production and processing of polymers»

Director of DAA _____ Naukenova A.S.

Director of DASc _____ Nazarbek U.B.

Director of DE&C _____ Bazhirov T.S.

РЕЦЕНЗИЯ
на образовательную программу
6В07280 – «Технология производства и переработки полимеров»
Южно-Казахстанский университет им. М.Ауэзова

Казахстан в рамках инновационно-индустриальной политики охватывает широкий спектр развития нефтехимии, предусматривающий комплекс задач, что позволит быстрыми темпами наращивать глубокую переработку продукции для сопутствующих отраслей нефти и газа, и эта процедура несомненно ускорит форсированное развитие экономики РК в перспективе, что определено в Стратегии развития РК-2050. Нефтяная и газовая промышленность развиваются высокими темпами. Разработка и внедрение в промышленность новых эффективных процессов получения мономеров, синтетических каучуков и резин требует точного и детального анализа состава и строения образующихся продуктов, глубокого понимания механизма получения продуктов. Такая необходимость будет возрастать по мере совершенствования процессов и технологий, внедрения в них средств автоматизации и непрерывно совершенствующейся компьютерной техники, повышения культуры производства.

Поэтому подготовка высококвалифицированных кадров, обладающих знаниями, умениями, навыками и компетенциями, позволяющими видеть, анализировать и находить пути решения инженерных проблем в области нефтехимическихпроизводствявляется первостепенной задачей.

Анализ инновационно-образовательной деятельности, качества инноваций и их педагогической целесообразности, проведенный посредством оценки по данным критериям, позволит сделать адекватные выводы об эффективности внедрения образовательных инноваций в учебный процесс при подготовке бакалавров по профилю «Технология производства и переработки полимеров».

Преимуществом рецензируемой образовательной программы является практико-ориентированный характер, способствующий укреплению взаимосвязей между вузом и работодателями.

Разработанная образовательная программа 6В07280 –«Технология производства и переработки полимеров» обеспечивает выборность образовательной траектории и разработана в контексте компетентностной модели подготовки бакалавров. Каждый модуль образовательной программы ориентирован на достижение определенного результата обучения.

Задачамиобразовательной программы являются:

-обеспечение обучаемого знаниями, умениями, навыками и компетенциями, позволяющими видеть, анализировать и находить пути решения инженерных проблем в области профессиональной деятельности с использованием современных технологий и результатов экспериментально-исследовательских работ;

-сформировать духовное и общественное сознание, социально-ответственное поведение в обществе, понимание значимости профессиональных этических норм и следование этим нормам.

-подготовка полиязычного высококвалифицированного, конкурентоспособного специалиста, владеющего языковой компетенцией на основе параллельного овладения казахским, русским и английским языками, мобильного в международном образовательном пространстве и на рынке труда, способного межкультурной коммуникации;

-обеспечение условий для формирования умений и навыков для предпринимательской деятельности.

На основе целей и результатов обучения разработан перечень модулей, изучение которых способствует приобретению обучающимися компетенций, соответствующих профилю образовательной программы. Образовательная программа содержит общие и специальные модули, которые обеспечивают формирование компетенций в области производственно-технологической, проектной, организационно-управленческой и научно-исследовательской компетенций.

Структура образовательной программы в целом логична и последовательна. ОП обеспечивает последовательность изучения дисциплин, основанную на их преемственности; рациональное распределение дисциплин и практик по семестрам с позиций равномерности учебной работы студента. ОП содержит общие, дополнительные модули, выходящие за рамки квалификации, междисциплинарные модули и модули специальности.

Формированию духовного и общественного сознания, понимания значимости профессиональных этических норм и следование этим нормам, а также формированиюполиязычного высококвалифицированного, конкурентоспособного специалиста способствует изучение дисциплин, включенных в модули «Основы общественных наук», «Модуль социально-этническогоразвития», «Модуль социально-политических знаний»и «Модуль коммуникаций и физической культуры».

Теоретическую и практическую подготовку в области химии и физики полимеров, теоретических основ переработки полимеров; технологии полимеризационных и поликонденсационных полимеров; технологии и аппаратурного оформления основных процессов переработки полимеров; специфики процессов с точки зрения охраны труда, техники безопасности, охраны природы; теоретических основ конструирования и расчета основных видов пластмасс и технологической оснастки для их производства;параметров процессов переработки, выбора области применения пластмасс, анализа возможных дефектов полученных пластмассовых изделий и способы их устранениябеспечивают дисциплины модулей «Основы специальности», «Полимерное материаловедение» и «Полимерные композиционные материалы».

Стремительное развитие химической науки и технологии в последние десятилетия в значительной степени обусловлено беспрецедентно быстрым совершенствованием методов научных исследованийвеществ.Модуль«Основы

научных исследований» включает в себя дисциплины, обеспечивающие формирование у обучающихся знаний озадачах и методах научных исследований; метрологическом обеспечении экспериментальных исследований, оформлении результатов научных исследований; внедрении научных исследований и основах патентоведения; общих положениях и особенностях проектирования предприятий по переработке пластмасс; методологии и методах расчета элементов конструкций на прочность, жесткость и устойчивость механизмов при проектировании химико-технологического оборудования.

Разработанная образовательная программа предусматривает профессионально-практическую подготовку обучающихся в виде учебной, производственной и преддипломной практик, направленных на закрепление практических навыков и расширение знаний, полученных студентами в процессе теоретического обучения. В период практики студенты изучают общие сведения о предприятии, его историю, схему управления и структуру предприятия, основные и вспомогательные цеха и их взаимодействие, химизм основного технологического процесса, устройство и назначение основных аппаратов, а также приобретают навыки работы на технологических установках.

Действуя в рамках кредитной технологии обучения, университет создает максимально благоприятные условия обучающимся для освоения всех дисциплин специальности и получения ими академической степени бакалавра. Подготовка кадров осуществляются в соответствии с требованиями работодателей.

Таким образом, представленнаяобразовательная программа 6В07280 – «Технология производства и переработки полимеров» в полной мере соответствует заявленному уровню подготовки бакалавров, обеспечивает решение одной из актуальных задач государства - подготовку высококвалифицированных кадров в области нефтехимических производств.

Главный технолог
ТОО «Шымкентская химическая компания» Аханов Д.Р



ЭКСПЕРТНОЕ ЗАКЛЮЧЕНИЕ

на образовательную программу 6В07280 –«Технология производства и переработки полимеров»

1.Актуальность образовательной программы

Сегодня общество выдвигает новые требования к качеству образования, а именно трансформируется его системообразующий элемент - цель образования. Компетентностный подход, внедряемый на данный момент в образовательные системы различных уровней, предполагает результатом образования в вузе формирование компетенций различного свойства. Реформирование цели образования ведет к необходимости перестройки всех элементов образовательной системы, внедрения инноваций на ее всех уровнях. Образовательные инновации в вузе имеют свою специфику, выражающуюся в основной цели их внедрения - улучшения качества подготовки к дальнейшей профессиональной деятельности.

Разработанная ОП соответствует обновленному содержанию программы по качественной подготовке бакалавров по профилю «Технология производства и переработки полимеров» и базируется на ожидаемых результатах обучения, которые в совокупности обеспечат формирование необходимых компетенций для решения профессиональных задач в будущей деятельности.

2. Соответствие целей и задач образовательной программы запросам работодателей

Современная подготовка инженеров требует быстрого реагирования на изменения рынка труда, производственной деятельности, что может быть реализована только в процессе инновационного образования.

Целью ОП является подготовка конкурентоспособных бакалавров, способных решать профессиональные задачи, вести проектную и научно-исследовательскую деятельность в области технологии нефтехимических производств.

Задачами ОП являются: обеспечение обучаемого знаниями, умениями, навыками и компетенциями, позволяющими видеть, анализировать и находить пути решения инженерных проблем в области технологии нефтехимических производств с использованием современных технологий и результатов экспериментально-исследовательских работ;формирование духовного и общественного сознания, социально-ответственное поведение в обществе, понимание значимости профессиональных этических норм и следование этим нормам; подготовка полиязычного высококвалифицированного, конкурентоспособного специалиста, владеющего языковой компетенцией на основе параллельного овладения казахским, русским и английским языками, мобильного в международном образовательном пространстве и на рынке труда, способного межкультурной коммуникации; обеспечение условий для формирования умений и навыков для предпринимательской деятельности.

Считаем, что цель и задачи ОП в полной мереотвечают запросам работодателей и студентов.

3.Соответствие ОП Национальной рамке квалификации Республики Казахстан. Образовательная программа соответствует 6 уровню Национальной рамки квалификаций Республики Казахстан (протокол РТК от 16.03.2016г.)

4.Отражение в ОП результатов обучения и компетенций, основанных на Дублинских дескрипторах, заложенных в профессиональных стандартах/ отраслевых рамках. Результаты обучения и компетенции отражены в соответствии с Дублинскими дескрипторами, 1 циклом Квалификационной Рамки Европейского Пространства Высшего Образования (A Frameworkfor Qualificationsof the European Higher Education Area), а также 6 уровнем Европейской квалификационной рамки для образования в течение всей жизни (The European Qualifcations FrameworkforLifelong Learning).

5. Соответствие классификатору направлений подготовки кадров с высшимобразованием

Структура и содержание ОП 6В07280 – «Технология производства и переработки полимеров» соответствуют требованиям приказа Министра образования и науки Республики Казахстан от 13 октября 2018 года № 569 «Об утверждении Классификатора направлений подготовки кадров с высшими послевузовским образованием»

6. Структура и содержание ОП, применение модульного принципа их построения

Образовательная программа построена в соответствии с кредитной технологией обучения на модульном принципе. В учебный план включены дисциплины вузовского компонента и дисциплины компонента по выбору. Дисциплины вузовского компонента обеспечивают формирование ключевых и профессиональных компетенций. Дисциплины компонента по выбору расширяют и углубляют подготовку обучающихся, способствуют получению дополнительных компетенций, знаний и умений, необходимых для обеспечения конкурентоспособности выпускника на рынке труда.

7. Логическая последовательность дисциплин и результаты обучения в учебных планах

ОП обеспечивает последовательность изучения дисциплин, основанную на их преемственности; рациональное распределение дисциплин и практик по семестрам с позиций равномерности учебной работы студента. Распределение дисциплин по учебным периодам рационально илогическивыверено. Предусмотрены все виды образовательной деятельности для подготовки высоко квалифицированных кадров для работы на производстве, в том числевладеющих навыками научно-исследовательской работы - теоретическая подготовка, производственная практика, написание и защита дипломного проекта/дипломной работы. Запланированный объем и временной ресурс на учебные дисциплины и виды подготовкиудовлетворяют квалификационным требованиям, предъявляемым к уровню выпускаемыхспециалистов.

Структурные части образовательной программы взаимосвязаны, преемственны, нацелены на достижение запланированного комплексного результата и раскрыты глубокои в полном объёме.

8. Отражение в ОП системы учета учебной нагрузки студентов и преподавателей в кредитах, ее соответствие параметрам кредитной системыобучения.

Содержание ОП полностью соответствует требованиям кредитной технологииобучения, в том числе в части учета учебной нагрузки студентов в кредитах. Предусматривается освоение 240 кредитов.

9. Наличие в программах производственной практики для закрепленияте оретического материала, выраженного в учебной нагрузке в кредита

Образовательная программа предусматривает проведение следующих видов практик: учебной практики - в объеме 1 кредита, производственной практики - в объеме10 кредитов и преддипломной практики - в объеме 10 кредитов.

10. Квалификация, получаемая в результате освоения ОП

По освоении ОП предусмотрено присвоение выпускнику квалификации бакалавр техники и технологий по образовательной программе 6В07280 – «Технология производства и переработки полимеров».

11. Рекомендации

Включенные в план дисциплины раскрывают сущность актуальных на сегодняшний день проблем нефтеперерабатывающей отрасли. Структура образовательной программы в целом логична и последовательна. В числе конкурентных преимуществ ОП следует отметить, что к ее реализации привлекаются ведущие специалисты профильных предприятий. Разработанная образовательная программа обладает целостностью – в ней взаимосвязаны цель, задачи и ожидаемые результаты обучения.

Таким образом, на основе анализа ОП утверждаем, что цели и содержание ОП, соответствуют современным требованиям подготовки бакалавров в области технологии и переработки полимеров и рекомендуем введение ОП 6В07280 – «Технология производства и переработки полимеров» в реестр ОП МНиВО РК.

Председатель экспертной комиссии, к.б.н., доцент декан ВШ «ТиПИ» — Еркебаева С.У.

Члены экспертной комиссии:

к.т.н., профессор — Пернебеков С.С.

к.т.н., доцент — Ханжаров Н.С.

PhD доктор, ст.препод. — Ешжанов А.А.