МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РЕСПУБЛИКИ КАЗАХСТАН
РГП на ПХВ «ЮЖНО-КАЗАХСТАНСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ ИМ.М.АУЭЗОВА» МОН РК

AUEZOV
UNIVERSITY
1943

ОБРАЗОВАТЕЛЬНАЯ ПРОГРАММА

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THE MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN
M.Auezov SOUTH KAZAKHSTAN UNIVERSITY

«APPROVED BY»
The Rector
d.h.s., academician Kozhamzharova D.P.
«25» 02 2021 y.

EDUCATION PROGRAMME

6B07170- «Chemical technology of organic substances»

Registration number	6B07100231
Code and classification of the field of education	6B07-Engineering, processing and construction industries
Code and classification of training areas	6B071 -Engineering and engineering practice
Group of educational programs	B060 - Chemical engineering and processes
Type of EP	Acting
ISCE level	6
NQF level	6
SQF of education level	6
Language of learning	Russian
Typical duration of study	4 years
Form of study	Full time
The complexity of the EP, not less	241 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-
Social Partner (DE)	-

Shymkent, 2021

Drafters:

Full name	Position	Sign
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EP was considered by the Committee on Innovative Learning Technologies and Methodological Support of the Higher school of ChEaBT, protocol № 7 from 22.02 2021.

Chairman of MC (Committee) _____
sign

Considered and recommended for approval at the meeting of Educational and Methodical Council of M. Auezov SKU.
protocol № 5 from 23.02 2021.

Approved by the decision of the Academic Council of the University
protocol № 12 from 25.02 2021.

CONTENT

Introduction

1. Area of application

Designed for the implementation of bachelors training by educational program (here in after - EP) 6B07170-" Chemical technology of organic substances " in Non-profit Limited Company "M.Auezov South Kazakhstan University" of RK MES.

2. Regulatory documents

Education Act of the Republic of Kazakhstan (as amended and supplemented on 07/04/2018);

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

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

The rules for the organization of educational process on credit technology education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan on April 20, 2011 No. 152 as amended and supplemented of October 12, 2018 No. 563

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.

3. Educational programs concept

The goal of the educational program is coordinated with the mission of university and is aimed at preparing the intellectual elite of the country with advanced entrepreneurial skills, fluent in three languages, demonstrating conceptual, analytical and logical thinking skills, creative approach in professional activities, being able to work in national and international teams obtaining the lifelong strategy.

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

The educational program is focused on professional and social order through the formation of professional competencies associated with the necessary types of research, practical and business activities, adjusted to meet the requirements of stakeholders.

The uniqueness of EP 6B07170- "Chemical technology of organic substances" is the base for the petroleum processing and petrochemical industries, focused on the labor market through the availability of elective courses commissioned by employers. EP 6B07170 - “Chemical Technology of Organic Substances” was internationally accredited by the International Agency ASIIN in 2014 and has the right to assign European label Eurobachelor® to graduates.

The educational program aims to achieve learning outcomes through the organization of the educational process using the principles of the Bologna process, student-centered learning, accessibility and inclusion.

Program learning outcomes are achieved through the following training events:

- classroom lectures: lectures, seminars, practical and laboratory works are held in the light of innovative learning technologies, the use of the latest achievements of science, technology and information systems. Laboratory works are held in the accredited laboratories of the University: Testing regional laboratory of the engineering profile "Constructional and biochemical materials" and the laboratory of physical and chemical analysis methods "SAPA", on the basis of educational and scientific production complexes LLP "Ecoshina", LLP "Hillcorporation", etc.

- extracurricular works: independent work of the learning, including under the guidance of a lecturer, individual counseling;

- carrying out professional practices, implementation of course and graduation works (projects) commissioned by enterprises.

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

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

4. Entry Requirements

Established according to the Model Rules for admission to studies in educational organizations that implement educational programs of higher and postgraduate education by order MES RK №600 on 31.10.2018

1. EDUCATION PROGRAMME PASSPORT

1.1 The purpose and objectives of education program by specialty

EP purpose: Preparation of competitive bachelors who are able to solve production problems, conduct design and research activities in the field of chemical engineering.

EP objectives:

-providing the student with the knowledge, skills, abilities and competencies that enable him to see, analyze and find solutions to engineering problems in the field of petroleum, gas and coal processing technology using modern technologies and the results of experimental research works;

- to form the spiritual and social consciousness, socially responsible behavior in society, an understanding of the significance of professional ethical norms and adherence to these norms;

-preparation of a multilingual highly qualified, competitive specialist, who owns language competence based on parallel mastering of Kazakh, Russian and English languages, mobile in the international educational space and on the labor market, capable of intercultural communication;

-providing conditions for the formation of skills for business activities.

1.2 List of qualifications and positions

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

Bachelors by EP 6B07107- "Chemical technology of organic substances" may hold positions: chief (production, site, section); installation chief; head of shift (by type of activity); park chief (commodity, reservoir, liquefied hydrocarbon gases); overpass chief (bulk, reactant economy); the head of the gas tapping house; head of the laboratory; manager; deputy head of the workshop, quality control engineer; process engineer; engineer (by type of activity); chemical engineer without requirements for work experience in accordance with the Industry framework qualifications "Petroleum and gas, petroleum processing and petrochemical industries", "Chemical production".

1.3 Qualification characteristics of the educational program graduate

1.3.1 Scope of professional activity

The scope of professional activity are enterprises for the production of organic substances, for the processing of petroleum, gas, coal and polymers, elastomers, paints and varnishes, research and project branch institutes, colleges.

1.3.2 Objects of professional activity

The objects of professional activity are equipment, technological processes and industrial systems for the production of substances, materials, products, as well as their management and regulation systems; chemical substances and materials; methods and devices for determining the composition and properties of substances and materials; methods and means of assessing the state of the environment and protecting it from the effects of industrial production, energy and transport.

1.3.3 Subjects of professional activity

The objects of professional activity of graduates are products of basic and fine organic synthesis, polymers, apparatuses and equipment for chemical technology of production and processing of organic substances and materials, various types of raw and auxiliary materials,

petroleum, gas, coal, polymers, monomers, elastomers, chemical reagents and reagents research instruments and equipment.

1.3.4 Types of professional activity

-production and technology;

- organizational and managerial;

-scientific-research;

-project.

2 EP LEARNING OUTCOMES

LO1 Possess informational and computational literacy, the skill of generalization, analysis and perception of information; communicate freely in a professional environment and society in Kazakh, Russian and English.

LO2 Use naturally scientific, mathematical, social, socio-economic and engineering knowledge, regulatory documents and elements of economic analysis in professional activities.

LO3 Have knowledge of the development regularity of nature and society, the main stages in the development of Kazakh statehood, to possess elements of spiritual, aesthetic and ethical culture.

LO4 Critically evaluate the current state of production of organic compounds, analyze and choose ways to improve existing and develop new technological processes based on modern achievements of science and technology.

LO5 Manage technological process of processing hydrocarbon raw materials in accordance with the technological regulations, safety regulations, industrial hygiene, fire safety and labor safety standards.

LO6 Perform qualitative and quantitative analysis of raw materials and products of hydrocarbon processing using chemical and physico-chemical methods of analysis.

LO7 Select and justify a rational technological scheme of production based on the laws of the processing of hydrocarbon raw materials, taking into account economic and environmental factors

LO8 To have the skills to compile material and heat balances, to calculate the main and auxiliary equipment of the technological scheme and to select them when designing and upgrading equipment.

LO9 Plan and carry out theoretical and experimental studies, interpret the results obtained using mathematical data processing methods and draw conclusions

LO10 Effectively work individually and as a member of the team, showing independence in solving production problems, using research, entrepreneurial skills, and raising qualifications throughout their lives.

3 COMPETENCES OF EP GRADUATE

3.1 Successful completion of training in EP contribute to the formation of the following competences of a graduate:

- core competencies (CC)
- professioanal competencies (PC).

Core competencies:

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

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

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

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

(CC3) *computer*

- the ability to confidently and critically use modern information and digital technologies for work, leisure and communications, mastering the skills of using, restoring, evaluating, storing, producing, presenting and exchanging information through a computer, communicating and participating in collaborating networks using the Internet for professional activities;

(CC4) *social*

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

(CC5) *economic, entrepreneurial*

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

(CC6) *cultural training*

- the ability to know and understand the traditions and culture of the peoples of Kazakhstan, to be tolerant to the traditions and culture of other peoples of the world, to realize the attitudes of tolerant behavior; be free from prejudice, possess high spiritual qualities.

(CC7) *additional competencies*

- ability to own the skills of critical thinking, interpretation, creativity analysis, drawing conclusions, evaluation; have creativity and an active lifestyle; make professional decisions under conditions of uncertainty and risk;

Professional competencies:

(PC1) *production and technology*

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

(PC2) *organizational and managerial*

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

(PC3) *scientific-research*

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

(PC4) *project*

- 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; draw up project documentation as a part of a group of authors.

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

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10
CC1	+								+	
CC2		+				+		+	+	
CC3	+	+						+	+	
CC4			+		+					+
CC5		+					+			+
CC6			+							+
CC7				+	+					+
PC1				+	+		+	+		+
PC2					+		+			+
PC3	+	+				+			+	
PC4		+					+	+		+

4. 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	
			OK	BK	KB	Theoretical training	Educational practice	Industrial/ Pre-diploma practice	Final examination			exam	dif. offset
1	1/	5	5	2	-	30				900	30	6	1
	2/	4	4	2	2	28	2			900	30	5	3
2	3/	5	3	3	2	30				900	30	5	3
	4/	6	1	2	5	26		4/		900	30	5	2
3	5/	4		1	6	30				900	30	6	1
	6/	3		-	4	24		6/		900	30	4	1
4	/7	2			5	20				600	20	4	1
	/8	2			4	20				600	20	4	2
	/9	1		1				/8	12	600	20		1
Итого		13	8	10	28	208	2	18	12	7200	240	39	15

5. INFORMATION ABOUT THE DISCIPLINES

Module	CYCLE	HSC/ EC	Component	Brief course description (30-50 words)	Number of credits	Codes
Achievements in the field of hydrocarbon processing	BD	HSC	Acamemic writing	Reflects the educational content, features of academic texts, reading behavior, writing an introduction, hypotheses and their construction, analyzing data, paragraph and its structure, writing the final part,plagiarism and ways to avoid it. Academic text-written in a complex structure aimed at explaining a specific topic.The main goals and objectives of the scientific review. Review in the system of genres of scientific discourse. Features of editorial revision in a scientific publication	3	LO1, LO2, LO3, LO8
	BD	HSC	Research Methods	Provides research novelties, a set of methods, techniques and textbooks on pedagogy and pedagogical technologies. Teaches the skills of innovative pedagogical activity, which is the basis for the formation of the competitiveness of any institution in the educational services market and determines the directions of professional growth of teachers.	4	LO1, LO2, LO3, LO8
	BD	EC	Complex processing of hydrocarbon resources	The course forms a deep system knowledge in the field of complex processing of hydrocarbon raw materials, solving scientific and technical problems in the organization of resource-saving industries. It instills the skills of in-depth analysis of scientific information for the purpose of scientific, patent and marketing support for basic research.	6	LO1, LO3, LO5, LO6
			New generation carbon materials	The course considers the methods of preparation, growth mechanism, technology and physics of the structures of carbon materials of the new generation; promising areas of research in this area. It instills the skills of organizing, planning and implementing the research process in the development of new carbon materials.		LO1, LO3, LO5, LO6
	BD		Pedagogical Practice	The course develops skills in designing teaching materials for conducting training sessions; analysis of domestic and foreign pedagogy and psychology of higher education in order to apply innovations in scientific and pedagogical activity in the context of rapid updating and growth of information flows.	10	PO1,PO2, PO3,PO8
Scientific bases and methods of research in the field of	Ch.D	HSC	Alternative sources of raw materials for the production of fuels	The course deepens knowledge about alternative sources of raw materials for fuel production. It instills the skills of applying special knowledge for critical analysis, evaluation and synthesis of new complex ideas, search and development of alternative sources of raw materials for fuel production.	4	LO1, LO3, LO5, LO6

chemical technology of organic substances	Ch.D	EC	New materials and processes in the rubber industry	Deepen knowledge on new developments in the field of synthetic rubber synthesis; search for new ingredients rubber compounds. It instills the skills of organizing, planning and implementing the research process in the development and use of new rubber compound ingredients for tire manufacturing.	4	LO1, LO3, LO5, LO6
			Innovative principles of creating composite materials	The course deepens the knowledge on the scientific basis of creating composite materials, on the mechanisms of their hardening. It instills the skills of organization, planning and implementation of the research process in the development and application of new composite materials.		LO1, LO3, LO5, LO6, LO7
	Ch.D	EC	Modern hydrogenation processes of oil refining	Forms the skills of analysis and synthesis of the results of numerous studies of chemistry and the mechanism of hydrogenation processes, which play an important role in oil refining and petrochemistry. Instills the skills of organization, planning and implementation of the research process in the development of hydrogenation refining processes.	4	LO1, LO3, LO5, LO6, LO7
			Multifunctional additives for fuels and oils	The course deepens the knowledge of the main directions of the synthesis and development of technology of multifunctional additives to oils and fuels. Instills the skills of conducting research on the synthesis and determination of the effectiveness of functional additives on the properties of fuels and oils.		LO1, LO3, LO5, LO6
	Ch.D		Research practice	It consolidates the practical skills of applying modern methods of scientific research, processing and interpretation of experimental data in the framework of the chosen topic of dissertation research; preparation of scientific publications, registration of applications for the proposed invention.	10	LO1, LO2, LO3, LO4, LO5, LO8
Module of final certification			Doctoral Research Scientific Work	It consolidates the practical skills of applying modern methods of scientific research, processing and interpretation of experimental data; preparation of scientific publications, presentations of a wide audience of research results, preparation and execution of competitive applications for research and design work.	123	LO1, LO2, LO3, LO4, LO5, LO8
			Writing and Defending a Doctoral Thesis	The course develops skills to transform the knowledge gained into innovative technologies, products of research activities; generalization and systematization of research results in the form of a doctoral dissertation, presentation of the main provisions of the dissertation work to a wide audience.	12	LO1, LO2, LO3, LO5, LO8
Total on the educational program					**180**	

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APPROVAL SHEET

by educational program

6B07170- «Chemical technology of organic substances»

Director of DAI _____ Naukenova A.S.
signature

Director of DAS _____ Nazarbek U.B.
signature

Director of DE&K _____ Bazhirov T.S
signature