

THE MINISTRY OF EDUCATION AND SCIENCE
OF THE REPUBLIC KAZAKHSTAN

M. Auezov SOUTH KAZAKHSTAN UNIVERSITY



d.h.s., academician D.P. Kozhamzharova
2021 y.

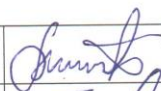
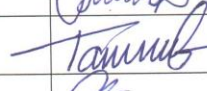

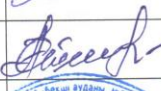





EDUCATION PROGRAMME

8D07172- " Technology Oil and Gas Processing »

Registration number	
Education area code and classification	8D07 Engineering, manufacturing and construction industries
Code and classification of training areas	8D071 Engineering and engineering
Group of educational programs	M097 Chemical engineering and processes
Type of EP	New
ISCED level	8
NQF level	8
ORC level	8
Language of instruction	English
Typical training period	3 years
Teaching method	intramura
The complexity of the EP, not less	180 credits
Distinctive features of EP	-
University partner (JEP)	-
University partner (TDEP)	-
Social partner (DE)	-

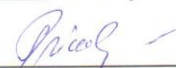
Shymkent – 2021

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The General education program was reviewed by the Committee on innovative learning technologies and methodological support of Higher schools of Chemical Engineering and biotechnology protocol № 7 from « 22 » 02 2021 y.

chairman of committee _____


signature

Reviewed and recommended for approval at a meeting of the Educational and methodological Council of M. Auezov SKU protocol № 5 from « 23 » 02 2021 y.

Approved by the decision of the Academic Council of the University Protocol № 12 from « 25 » 02 2021 y.

CONTENT

	Introduction	5
1.	Passport of the educational program	7
2.	learning outcomes on EP	8
3.	Competencies of the EP graduate	9
4.	Summary table showing the amount of loans disbursed in the context of educational program modules	10
5.	Information about disciplines	11
	Approval list	18
	Appendix 1. Review from the employer	19
	Appendix 2. Expert opinion	21

Introduction

1. Application

It is intended for the preparation of doctors of philosophy (PhD) in the educational program (hereinafter - OP) 8D07172-"Technology of oil and gas processing" in the RSE at the PHW "South Kazakhstan state University named after M. Auezov" MES RK.

2. Normative document

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

Standard rules of activity 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 dated October 30, 2018 No. 595 (registered in the Ministry of justice of the Republic of Kazakhstan on October 31, 2018 No. 17657);

State mandatory standards of higher and postgraduate education, approved by the order of the Minister of education and science of the Republic of Kazakhstan dated October 31, 2018 No. 604;

Rules for the organization of the educational process on credit technology of training, approved by the order of the Minister of education and science of the Republic of Kazakhstan dated April 20, 2011 No. 152 with amendments and additions dated October 12, 2018 No. 563;

The industry qualification framework "Oil and Gas, oil refining and petrochemical industries" was approved by the Protocol of the Industry Commission on social partnership and regulation of social and labor relations of the oil and gas industry dated March 30, 2017 No. 1-2017

The industry qualification framework "Chemical production" was approved by the Protocol of The meeting of the industry commissions on social partnership and regulation of social and labor relations for the mining, chemical, construction and woodworking, light industry and mechanical engineering dated August 16, 2016 No. 1.

Professional standard "Teacher" (Appendix to the order of the Chairman of the Board of the National chamber of entrepreneurs of the Republic of Kazakhstan" Atameken " No. 133 dated June 8, 2017).

3. Concept of the educational program

The purpose of the educational program is consistent with the mission of the University and is aimed at training the intellectual elite of the country with advanced knowledge, organizational and managerial qualities, able to generate new knowledge in the field of oil refining technology and petrochemistry, formulate production tasks in a professional language and solve them with the help of modern technologies; they are fluent in the state, Russian and English languages, demonstrate the skills of systematic, analytical and logical thinking, creative approach in professional activities, are able to work in a national and international team, learn the strategy of learning throughout their lives.

Educational program harmonized with the 8-level National qualifications framework of the RK, with the Dublin descriptors 3 cycle Qualifications Framework of the European Higher Education area. (A Framework for Qualification of the European Higher Education Area), also with level 8 of the European Qualification Framework for Lifelong Learning.

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

The uniqueness of the preparation of doctors of philosophy PhD in EP 8D07172 - "Technology of oil and gas processing"

EP is focused on the integration of the educational process, research and innovation activities, which contributes to the high competitiveness of graduates in the labor market;

The EP is aimed at orientation of scientific research in priority areas of science and technology development, training with leading domestic and foreign specialists, manufacturers, the opportunity to work in scientific laboratories with unique equipment, participation in international scientific and educational projects, internships in leading Russian and foreign companies and universities.

EP is implemented by attracting the technical base and highly qualified specialists of specialized enterprises in the region.

Leading scientists of the Department and foreign scientists who are heads of well-known scientific schools in Kazakhstan and abroad are involved in the educational process.

The EP is aimed at training professional managers and specialists for the oil refining and petrochemical industries, teachers who are capable of non-standard thinking and bold original solutions, developing strategic approaches to solving research problems, and possessing in-depth scientific and pedagogical knowledge.

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 inclusiveness.

The results of the training program are achieved through the following training activities:

classroom classes: lectures, seminars, practical and laboratory classes are conducted taking into account innovative teaching technologies, the use of the latest achievements of science, technology and information systems. Laboratory classes are held in accredited laboratories of the University: the regional Testing laboratory of engineering profile "Structural and biochemical materials" and the Laboratory of physical and chemical methods of analysis "SAPA", on the basis of educational and research and production complexes of "Ekoshina" LLP, "Hillcorporation" LLP, etc.;

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

-conducting pedagogical and research practices, performing doctoral dissertations;

- research work of a doctoral student(R & d): independent scientific work of the student, including the implementation of a doctoral dissertation and foreign scientific training.

The University has taken measures to maintain academic integrity and academic freedom, and to protect students from any kind of intolerance and discrimination.

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

4. Requirements for applicants

Established under the Model rules of admission for training in organization of education, implementing educational programs of higher and postgraduate education MES RK order No. 600 of 31.10.2018

1. PASSPORT OF THE EDUCATIONAL PROGRAM

1.1 Purpose and objectives of the educational program

The goal of the EP is to train competitive personnel in the field of oil refining and petrochemistry technology, who are able to develop theories, create, implement and operate

advanced chemical technologies of oil and gas, formulate and solve scientific, educational and production tasks in a professional language with the use of modern technologies.

EP tasks:

- provide doctoral students with a solid Foundation for management, analytical and consulting activities in the field of oil refining technology and petrochemistry;
- to provide doctoral students with strong analytical, research and leadership qualities and team work skills that allow them to solve problems of increasing the country's competitiveness in the modern economy;
- provide doctoral students with lifelong learning skills that will enable them to successfully adapt to changing technologies in the field of chemical processing of hydrocarbons throughout their professional careers;
- provide doctoral students with the broad education necessary to understand the impact of chemical technologies for processing hydrocarbons in a global and social context;
- creation on the basis of integration of education and science of an effective system of training of scientific, scientific and pedagogical personnel of a new formation, capable of solving issues of improving society, economy, production, science and development of new technologies.

1.2 List of qualifications and positions

The graduate is awarded the degree of doctor of philosophy (PhD) in the educational program 8D07172- "Technology of oil and gas processing»

Doctor of philosophy (PhD) in the educational program 8D07172 - "technology of oil and gas processing" can hold the positions of a researcher, teacher of a higher educational institution without presenting requirements for work experience, General Director (Chairman of the Board), Deputy General Director (in areas), project Manager, with practical experience in the specialty, or managerial experience in accordance with the qualification requirements of the Qualification directory of positions of managers, specialists and other employees, approved by the order of the Minister of labor and social protection of the population of the Republic of Kazakhstan dated may 21, 2012 No. 201-o-m.

1.3 Qualification characteristics of the graduate of the educational program

1.3.1 Scope of professional activity

The sphere of professional activity is enterprises for the preparation and processing of oil, gas, solid fuels, organic materials, research and design industry institutes, higher educational institutions.

1.3.2 Objects of professional activity

The objects of professional activity are: equipment, technological processes and industrial systems for obtaining new substances, materials, products, as well as their management and regulation systems; chemical processes; patterns of chemical processes; scientific tasks of an interdisciplinary nature; methods and devices for determining the composition and properties of substances and materials; methods and means for assessing the state of the environment and protecting it from the influence of industrial production, energy and transport; educational and methodological documentation, technical training tools.

1.3.3 Subjects of professional activity

The subjects of professional activity are: products of oil, gas, solid fuels, petrochemicals, devices and equipment for the preparation, processing, storage, transportation of oil, gas, solid fuels, various types of raw materials and auxiliary materials and substances, chemical reagents and reagents, research instruments and equipment.

1.3.4 Types of professional activities

- research;
- industrial-technological;

- organizational and managerial;
- design;
- scientific-pedagogical.

2. Learning outcomes at the OP

LO1 Use professional knowledge to critically evaluate modern scientific ideas about the structure of oil and fuel dispersed systems and their transformations, to intensify refining processes and improve the performance properties of fuels and lubricants, to generate new ideas for solving research and practical problems, including in interdisciplinary fields.

LO2 to Carry out and develop research and educational activities in the field of oil and gas processing technology and petrochemistry using innovative research methods and information and communication technologies.

LO3 Analyze and select appropriate algorithms for selling their own and collective ideas and achievements to interested consumers based on the study of legal protection of new technologies and scientific projects.

LO4 Participate in professional discussions using modern methods and technologies of scientific communication in the state and foreign languages, publish research results in international rating publications.

LO5 to Form new directions and forecast the results of research and development, to carry out scientific management of research on the most important scientific problems of fundamental and applied nature, to guide and control any stages or complexes of production of fuels, oils and petrochemicals.

LO6 Conduct research expertise of completed research and development, provide scientific guidance for the practical implementation of research results, and determine the scope of application of research and development results in the field of production, transport, oil and gas processing, the use of oil and gas processing products and petrochemicals.

LO7 Possess the skills of leadership management and team management, team work, planning and solving problems of their own professional and personal development, show tolerance and respect for others, the ability to group professional activities and cooperation in an international environment.

LO8 Adapt and generalize the results of modern scientific research to solve scientific and educational problems for teaching specialized disciplines and leading research teams.

3 COMPETENCIES OF THE GRADUATE EP

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

(QC 1) language and computer

- the ability to apply basic communication skills in a foreign language in oral and written forms; the ability to use modern information and digital technologies to analyze, evaluate and synthesize new complex ideas necessary for professional activity;

(QC 2) managerial, economic and entrepreneurial

- ability to manage and conduct business, be responsible for planning, development and results of business processes that may lead to significant changes or development of the enterprise, manage personnel, demonstrate entrepreneurial skills;

(QC 3) technical

- the ability to apply the educational potential, knowledge and experience acquired during the study of technical disciplines to solve innovative problems in the professional sphere; the ability to design objects of the chemical industry using analytical methods and complex models in conditions of uncertainty.

(QC 4) research

-the ability to analyze scientific and technical information in the field of chemical technology of organic substances for the purpose of scientific, patent and marketing support of research; the ability to summarize the results of research work in the form of scientific publications, to defend their position in the discussion and make professional decisions in conditions of uncertainty and risk;

(QC 5) methodological

- the ability to analyze and comprehend the realities of modern theory and practice based on the methodology of natural science knowledge, apply new methods of teaching specialized disciplines in pedagogical activities; develop new laboratory facilities for conducting workshops, update and deepen the knowledge necessary for scientific and pedagogical activities.

3.2 Matrix of correlation of the learning outcomes in EP as a whole with the formed competencies of modules

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
QC 1	+				+	+	+	
QC 2	+		+		+		+	
QC 3	+	+	+			+	+	
QC 4	+	+	+	+				+
QC 5	+	+						+

4. SUMMARY TABLE SHOWING THE AMOUNT OF LOANS DISBURSED IN THE CONTEXT OF EDUCATIONAL PROGRAM MODULES

Training course	Semester /trimester	Number of modules to be mastered	Количество изучаемых дисциплин		Number of credits KZ					Total hours	Total loans KZ	Quantity	
			UK	OC	Theoretical training	Pedagogical practice	Research practice	RODS	Final certification			exam	deeth. test
1	1	2	2	4	30	-	-	-	-	900	30	6	-
	2	2	-	-	-	8	-	22	-	900	30	-	2
2	3	2	-	-	-	-	15	15	-	900	30	-	2
	4	1	-	-	-	-	-	30	-	900	30	-	1
3	5	1	-	-	-	-	-	30	-	900	30	-	1
	6	1	-	-	-	-	-	18	12	900	30	-	2
total		3	2	4	30	8	15	115	12	5400	180	6	8

5. Information about disciplines

The name of the module	CYCLE	UC/OC	The component name	Brief description of the discipline (30-50 words)	Number of credits	The generated LO (codes)
Innovations in oil refining and petrochemicals	Basic discipline	University component	Innovations in pedagogy and research	Considers innovations in pedagogy and scientific research of pedagogical technologies, a set of methods, techniques and teaching tools. Instills the skills of innovative pedagogical activity, which is the basis for creating the competitiveness of an institution in the market of educational services and determines the direction of professional growth of the teacher.	3	LO1,LO2, LO3,LO8
	Basic discipline	Optional component	Modern instrumental research methods in oil refining and petrochemistry	It considers the theoretical foundations of instrumental (spectral, chromatographic, etc.) methods, instrumental methods of structural-dynamic analysis of light and dark oil products. Develops skills in applying various methods of instrumental research to obtain detailed information on the physicochemical composition, structure, reactivity of oil and oil products.	5	LO1,LO2, LO6, LO8
			Physicochemistry and chemometrics of oil disperse systems	It considers the essence of colloidal-chemical transformations of ODS on the basis of modern concepts and analytical research methods, the impact on ODS of various factors. It instills the skills of analyzing the patterns of behavior of the oil system during its production, transport and processing, analysis and evaluation of the dispersed state (thermodynamic stability, relaxation and thixotropic characteristics, phase states) of the oil system under consideration.		LO1, LO2, LO5, LO8
	Basic discipline	Optional component	Production and applying of synthetic lubricants	It considers the technology and prospects of production, ways of using synthetic lubricants; equipment of technological installations, methods for expanding the production of synthetic lubricants. It allows to acquire skills in determining the composition and properties of synthetic lubricants.	5	LO2, LO4, LO6, LO8
			Innovative technological developments in the production of special refined products	It considers the latest and promising methods and technologies for the production of special oil refining products. Develops skills in organizing, planning and implementing a research process in the field of developing new special oil refining products.		LO2, LO3, LO4, LO6, LO7, LO8
	Basic discipline		Pedagogical practice	Develops skills of designing didactic materials for conducting training sessions; analysis of domestic and foreign pedagogy and psychology of higher education in order to apply innovations in scientific and scientific-pedagogical activities in	8	LO1,LO2, LO4, LO7, LO8

				the conditions of rapid updating and growth of information flows. Develops a context-competent and systematic psychological and pedagogical approach to solving various pedagogical problems.		
Scientific principles in research and processing technology oil and gas	Profile of discipline	University component	Modern methods of scientific research	Considers methods of critical analysis and evaluation of modern scientific achievements in chemistry and technology of oil and gas; features of presentation of scientific results in oral and written forms when working in domestic and international research teams. Instills the skills of generating new ideas in solving research and practical problems, including in interdisciplinary areas; conducting experiments on modern devices.	5	LO1, LO2, LO4, LO5, LO6, LO8
	Profile of discipline	Optional component	Innovative methods for improving the operational properties of fuels and lubricants	It deepens knowledge on new developments in the field of production and methods for improving the operational properties of fuels and lubricants; in the main areas of synthesis and development of technology for multifunctional additives to oils and fuels. It instills skills in conducting research on the synthesis and determination of the effectiveness of functional additives on the properties of fuels and oils.	6	LO1, LO2, LO5, LO6
			Special additives for intensification of oil refining processes	Deepens knowledge on the scientific basis of creating special additives for intensifying the processes of oil refining of composite materials, on the mechanisms of their hardening, mathematical modeling of the physical and mechanical behavior of the composite medium of mixtures. Instills the skills of organizing, planning and implementing the research process in the development and application of new composite additives.		LO1, LO3, LO5, LO6, LO7, LO8
	Profile of discipline	Optional component	Scientific fundamentals of hydrocatalytic processes oil refining	It deepens knowledge on the theoretical foundations of processes, considers the laws that relate the structure and chemical properties of catalysts, directional changes in the properties of catalysts, deepen and substantiate the concept of stage-by-stage functional preparation and processing of distillate and residual raw materials of hydrocatalytic processes. It instills skills in organizing and implementing the results of scientific and technological developments in the field of hydrocatalytic oil refining processes.	6	LO1, LO3, LO5, LO6
			Technology of technical fluids and special products of oil production	It considers the technological fundamentals and aspects of the practical application of cooling, brake, hydraulic, shock absorber, starting, flushing and cleaning fluids and special products, their impact on the operation of various components and devices during operation of the equipment are considered. Studying of promising quality indicators of technical fluids and the selection of promising special fluids in the laboratory.		LO1, LO3, LO5, LO6

	Profile of discipline		Research practice	Instills the skills of searching and analyzing the latest theoretical, methodological and technological achievements of domestic and foreign science. Strengthens practical skills of applying modern methods of scientific research, processing and interpretation of experimental data within the chosen topic of dissertation research; preparation of scientific publications, registration of applications for the proposed invention.	15	LO1,LO2, LO3,LO4, LO5, LO6, LO8
The module final assessment			Research work of a doctoral student	Instills the skills of organizing and conducting research work on the topic of a doctoral dissertation. Strengthens practical skills in applying modern research methods, processing and interpreting experimental data, preparing scientific publications, presenting research results to a wide audience, and drafting and processing competitive applications for research and design work.	115	LO1,LO2, LO3,LO4, LO5, LO8
			Writing and defending a doctoral thesis	Instills the skills of transforming the received knowledge into innovative technologies, products of research activities; generalization and systematization of research results in the form of a doctoral thesis, presentation of the main provisions of the dissemination work to a wide audience.	12	LO1,LO2, LO3, LO4, LO5, LO8
Total for the educational program					180	

APPROVAL SHEET

by educational program

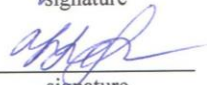
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