Institute of Geology and Oil and Gas Engineering named after K.I. Turysov
Department of Hydrogeology, Engineering and Petroleum Geology

EDUCATIONAL PROGRAM
8D07206 - "Oil and Gas Geology"
code and name of the educational program

Code and classification of the field of education: 8D07 Engineering, manufacturing and construction industries
Code and classification of training areas: 8D072 Manufacturing and processing industries
Group of educational programs: D121 Geology
NRC level: 8
ORK level: 8
Duration of study: 3
Volume credits: 180

Almaty 2025

Educational program 8D07207 - " Geology of Oil and Gas"
approved at a meeting of the Academic Council of KazNITU named after K.I. Satpayev

Protocol No. 10 of “06” 03_ 2025

Reviewed and recommended for approval at a meeting of the Educational and Methodological Council of KazNITU named after K.I. Satpayev .

Protocol No. 3 of “20” 12_ 2025

Educational program 8D07207 - " Geology of Oil and Gas"
code and name of the educational program
developed by the academic committee in the field of " Manufacturing and Processing Industries"

Full name	Academic degree/ academic title	Job title	Place of work	Signature
Chairman of the Academic Committee:				
Paragulgov Timur Khalitovich	Candidate of Geological and Mineralogical Sciences	Director of Geology of GIS Energy LLP	GIS Energy LLC , Geology and Geophysics Advisor, RAMCO OIL LLC, +7 7017600656	
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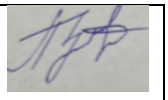
Employers:				
Paragulgov Timur Khalitovich	Candidate of Geological and Mineralogical Sciences	Director of Geology of GIS Energy LLP	GIS Energy LLC , Geology and Geophysics Advisor, RAMCO OIL LLC, +7 7017600656	
Students				

Pikirbekova Zarifa Sattarovna	-	First-year doctoral student, OP 8D07206 "Geology of Oil and Gas"	JSC "Kazakh National Research Technical University named after K.I. Satpayev ", mobile phone: +77011743054 , **:** zarifa_91.91@mail.ru	

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List of abbreviations and designations

BD – basic disciplines
GOSO – state compulsory education standard
DP – documented procedure
DOT – distance educational technologies
UNT – Unified National Testing
IEP – individual educational plan
KTO – credit-based learning technology
KED – catalog of elective courses
MES RK – Ministry of Education and Science of the Republic of Kazakhstan
MOP – modular educational program
R&D – scientific research work
NIRD - scientific research activity
NIRM – research work of a master's student
OOD – general education disciplines
OP – educational program
PD – major disciplines
PC – personal computer
PPS – professorial and teaching staff
RK – Republic of Kazakhstan
RUP – working curriculum
QMS – quality management system
SRD – independent work of a master's student
SRDP – independent work of master's students under the supervision teacher
ТУПл – standard curriculum
UVP – educational and support personnel
UMKD – educational and methodological complex of disciplines
UMS – educational and methodological council
UMR – educational and methodological work
EUM – electronic educational materials

1. Description of the educational program

The educational program for training a Doctor of Philosophy (PhD) has a scientific and pedagogical focus and involves fundamental educational, methodological and research training and in-depth study of disciplines in relevant areas of science for the system of higher and postgraduate education and the scientific sphere.

The educational program for training a doctor in the profile involves fundamental educational, methodological and research training and in-depth study of disciplines in the relevant areas of science for the branches of the national economy and social sphere: education, medicine, law, art, economics, business administration and in the field of national security and military affairs.

Doctoral educational programs in terms of professional training are developed based on a study of the experience of foreign universities and research centers implementing accredited programs for training PhD doctors or doctors in the relevant field.

The content of the educational program for specialized doctoral studies is established by the university independently.

The main criterion for completion of the educational process for training Doctors of Philosophy (PhD) (doctor in the profile) is the mastery by the doctoral student of at least 180 academic credits, including all types of educational and scientific activities.

The duration of doctoral study is determined by the number of academic credits earned. Upon completion of the required number of academic credits and achievement of the expected learning outcomes for a Doctor of Philosophy (PhD) degree or related field, the doctoral program is considered fully completed.

Doctoral training is carried out on the basis of master's degree programs in two areas:

1) scientific and pedagogical with a training period of at least three years;
2) specialized with a training period of at least three years.

Contents of the OP

Objectives of the educational program:

- Preparing graduates for professional activity, developing spiritual values, moral and ethical standards of the individual as a member of society, and implementing the legal and legislative system of the Republic of Kazakhstan with a high level of professional culture and civic position.
- Preparing graduates for continuous self-improvement and self-development, acquiring new knowledge, skills, and abilities in innovative areas of development in the geological exploration, hydrogeological, and oil industry.
- To prepare graduates competent in production, management, organizational, technological, and scientific-pedagogical fields using modern educational information technology tools and resources. Graduates are capable of independently formulating and implementing new research directions.
- Training of a graduate, based on the diversity and dynamism of the catalogue of

elective disciplines of the curriculum, with a predominance of practical skills in competencies, capable of performing professional functions within the framework of one or more types of activities based on the final learning outcomes, taking into account the specifics of these types of activities, market requirements for organizational, managerial, and professional competencies.

•To prepare graduates as competitive specialists in the field of geological exploration and oil and gas production, including through increasing the international aspect in educational and scientific programs, competent in the field of advanced technologies, the implementation and presentation of scientific research results

2. The purpose and objectives of the educational program

The purpose of the educational program: The purpose of the doctoral program "Geology of Oil and Gas" is to provide the doctoral student with a comprehensive and high-quality professional education in the field of oil and gas field exploration, as well as in oil field geology, confirmed by the level of knowledge, skills, abilities and competencies based on the criteria established by the state mandatory standard.

To achieve this goal, doctoral students, according to the curriculum, acquire knowledge in two cycles of academic disciplines: basic disciplines (BD) and specialized disciplines (PD).

The main objectives of the educational program "Oil and Gas Geology" are:

- *in scientific and pedagogical training:*

1) obtaining in-depth knowledge and competencies in the field of petroleum geology related to exploration work and oil field geology related to the development of hydrocarbon deposits;

2) training specialists with a high level of professional culture, having a civic position, capable of formulating and practically solving modern scientific and practical problems, developing in them modern environmental thinking, having a knowledge base that allows them to teach in higher educational institutions, and successfully carry out research and management activities in the field of oil and gas geology;

3) acquisition of scientific research skills, participation in scientific events at various levels, mastery of the methodology of conducting scientific research, continuation of scientific training in doctoral studies;

4) obtaining the necessary minimum knowledge in the field of university pedagogy and psychology and experience in teaching at a university;

- *in specialized training* :

1) obtaining in-depth knowledge and skills in the field of petroleum and oil field geology;

2) development of the ability for self-improvement and self-development, acquisition of skills and motivation for independent creative acquisition of new knowledge throughout active life;

3) mastering fundamental courses at the intersection of sciences, guaranteeing

professional competence and mobility.

The program's mission is to ensure the qualitative growth of the region's human capital in the field of hydrocarbon exploration and field geology, through the development of an innovative and scientific-educational environment and the training of highly qualified personnel with high personal and professional competencies in accordance with market needs.

The objects of professional activity of doctoral graduates are:

- design and survey, production and technological and expert management in the field of subsoil use;

- research and teaching in the areas of science and education related to petroleum and oil field geology.

Doctoral students can perform the following types of professional activities:

- pedagogical;
- scientific research.

Training in this specialty is conducted within the framework of approved curricula. The knowledge acquired by doctoral students in a range of specialized disciplines has proven to be highly sought after by industrial and scientific organizations involved in the study and application of innovative methods for forecasting, prospecting, exploration of hydrocarbon deposits, and subsequent monitoring of their development.

The duration of study for the EP “ 8D07206 - Oil and Gas Geology” is 3 years, with 2 semesters lasting 15 weeks each in each academic year (6 semesters in total).

Final assessment takes the form of an exam. The preferred form of examination is an oral questioning of doctoral candidates. The final decision on whether to conduct oral or written examinations is made by the university's Academic and Methodological Council based on the submissions of the academic institutions.

Admission to KazNITU named after K.I. Satpayev is carried out through the placement of a state educational order (educational grants), as well as tuition fees from citizens' own funds and other sources.

educational program is popular among doctoral graduates in this specialty. The state annually awards up to three to four grants for training in this program.

The program's objectives are:

Objectives of the educational program:

- Preparing graduates for professional activity, developing spiritual values, moral and ethical standards of the individual as a member of society, and implementing the legal and legislative system of the Republic of Kazakhstan with a high level of professional culture and civic position.
- Preparing graduates for continuous self-improvement and self-development, acquiring new knowledge, skills, and abilities in innovative areas of development in the geological exploration, hydrogeological, and oil industry.
- To prepare graduates competent in production, management, organizational, technological, and scientific-pedagogical fields using modern educational information technology tools and resources. Graduates are capable of independently formulating and implementing new research directions.

•Training of a graduate, based on the diversity and dynamism of the catalogue of elective disciplines of the curriculum, with a predominance of practical skills in competencies, capable of performing professional functions within the framework of one or more types of activities based on the final learning outcomes, taking into account the specifics of these types of activities, market requirements for organizational, managerial, and professional competencies.
•To prepare graduates as competitive specialists in the geological exploration and oil and gas production sectors, including through an increased international focus in educational and scientific programs, competent in advanced technologies, and the implementation and presentation of scientific research results.

3. Requirements for the assessment of learning outcomes of the educational program

By the end of the educational program " 8 D 07207 - Oil and Gas Geology " doctoral students will be able to:
PO 1. Assess current trends, directions, and patterns of scientific development in the field of geology, prospecting, exploration, and production of oil and gas in the context of globalization and internationalization; apply scientific developments in practical activities.
PO 2. Confirm and apply new knowledge and skills, synthesis and evaluation skills in research and professional activities.
RO 3. Create models of geological objects at both local and regional levels based on the use of in-depth theoretical and practical knowledge and computer programs in the field of oil and gas geology.
RO 4. Analyze information from various sources; develop independent scientific research characterized by academic integrity, based on modern theories and analytical methods.
PO 5. Formulate your own new scientific ideas, demonstrate your knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge, apply appropriate methods of analysis, both qualitative and quantitative
PO 6. Create a research group in the field of oil and gas exploration or industrial geology, defend new developments in front of specialists and experts.
PO 7. Demonstrate and confirm teaching skills in undergraduate and graduate programs, working with students, teaching them to develop research projects, draw conclusions from the results and manage them.
PO 8. Demonstrate high professional qualities and ethics while performing production or scientific tasks in the geological exploration and oil and gas industries.

The following forms of examination are used to assess learning outcomes: written examination, practical examination (open questions, problem solving), and research work.

The final certification ends with the defense of the doctoral dissertation .

4. Passport of the educational program

4.1. General information

No.	Field name	Note
1	Code and classification of the field of education	8D07 Engineering, manufacturing and construction industries
2	Code and classification of training areas	8 D 072 Manufacturing and processing industries
3	Group of educational programs	D 121 - Geology
4	Name of the educational program	8 D 07206 – Geology of Oil and Gas
5	Brief description of the educational program 8 D 07206 – Geology of Oil and Gas - Doctoral Studies	Training highly qualified research specialists in the field of oil and gas geology, capable of conducting fundamental and applied research, developing new methods for prospecting, exploration, and development of oil and gas fields. Deep understanding of geological processes: knowledge of theories of formation and evolution of oil and gas basins, methods of geological exploration and characteristics of oil and gas provinces. Experience in conducting scientific research: proficiency in field and laboratory research methods, analysis of geological data, geophysical and geochemical methods. Development and implementation of new technologies: the ability to develop and implement new technologies and methods for prospecting, exploration and development of oil and gas fields. Publication activity: the ability to publish research results in leading scientific journals and present them at international conferences. Teaching experience: ability to teach courses on oil and gas geology at universities.
6	The purpose of the OP	The goal of the doctoral program in Oil and Gas Geology is to provide doctoral students with a comprehensive and high-quality professional education in the field of oil and gas exploration, as well as in oilfield geology, confirmed by the level of knowledge, skills, abilities, and competencies based on criteria established by the state mandatory standard.
7	Type of OP	New OP
8	Level according to the National Qualification Test	8
9	Level according to the ORK	8
10	Distinctive features of the OP	No
11	List of competencies of the educational program:	in the field of scientific and scientific-pedagogical activity in the context of rapid renewal and growth of information flows; in conducting theoretical and experimental scientific research; in setting and solving theoretical and applied problems in scientific research; in conducting a professional and comprehensive analysis of problems in the relevant field; in matters of interpersonal communication and

		human resources management; in matters of university training of specialists; in conducting examinations of scientific projects and research; in ensuring continuous professional growth.
12	Learning outcomes of the educational program:	PO 1. Assess current trends, directions, and patterns of scientific development in the field of geology, prospecting, exploration, and production of oil and gas in the context of globalization and internationalization; apply scientific developments in practical activities. new knowledge and skills, synthesis and evaluation skills in research and professional activities. PO 3. Create models of geological objects at both local and regional levels based on the use of in-depth theoretical and practical knowledge and computer programs in the field of oil and gas geology. PO 4. Analyze information from various sources; develop independent scientific research characterized by academic integrity, based on modern theories and methods of analysis. PO 5. Formulate your own new scientific ideas, demonstrate your knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge, apply appropriate methods of analysis, both qualitative and quantitative PO 6. Create a research group in the field of oil and gas exploration or industrial geology, defend new developments in front of specialists and experts. PO 7. Demonstrate and confirm teaching skills in undergraduate and graduate programs, working with students, teaching them to develop research projects, draw conclusions from the results and manage them. PO 8. Demonstrate high professional qualities and ethics while performing production or scientific tasks in the geological exploration and oil and gas industries.
13	Form of study	daytime
14	Duration of study	3 days
15	Loan volume	1 8 0
16	Languages of instruction	Russian, Kazakh, English
17	Awarded academic degree	Doctor of Philosophy (PhD)
18	Developer(s) and author(s):	Ensepbaev Talgat Ablaevich Uzbekgaliev Rizakhan Halelovich Yeskozha Bazar Atashevich

4. 2 . Interrelation attainability generated results training By educational program And educational disciplines

No.	Name of the discipline	Brief description of the discipline	Cycle	Component	Loans	RO 1	RO 2	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8
1	LNG305 Academic writing	Objective: to develop academic writing skills and writing strategies for doctoral students in engineering and natural sciences. Content: fundamentals and general principles of academic writing, including: writing effective sentences and paragraphs, writing an abstract, introduction, conclusion, discussion, and references; in-text citation; preventing plagiarism; and preparing a conference presentation.	BD	VK	5	+			+		+	+	
2	MET322 Methods of scientific research	Purpose: It consists in mastering knowledge about the laws, principles, concepts, terminology, content, specific features of the organization and management of scientific research using modern methods of scientometry. Contents: structure of technical sciences, application of general scientific, philosophical and special methods of scientific research, principles of organization of scientific research, methodological features of modern science, ways of development of science and scientific research, the role of technical sciences, computer science and engineering research in theory and practice.	BD	VK	5	+	+		+	+		+	
3	GEO337 Changing basin modeling to improve the efficiency of exploration work	The course is dedicated to the method of oil and gas systems and is used for the search, exploration and additional exploration of oil and gas fields. Students master the methodology of basin modeling when solving various tasks related to the restoration of the geological history of the basin, sedimentation conditions, the formation of oil-bearing rocks, the zone of oil and gas generation and migration of hydrocarbons. This knowledge contributes to an increase in reliable, uninterrupted and sufficient energy production, which is necessary for a sustainable economic recovery.	BD	KV	5	+		+	+				+

4	Prediction of geological risks	The course is devoted to various modern tools, technologies, research methods in the exploration and evaluation of oil and gas reserves. Geological risks at the stages of prospecting and exploration, during regional reconstructions, when identifying local structures, determining the time of generation of hydrocarbons, the predominant direction of hydrocarbon migration. The development of an oil or gas trap after their formation, the probability of their preservation and reformation. Geological connectivity of traps, oil and gas fields, oil and gas accumulation zones.	BD	KV	5		+		+		+		+
5	Geochemical methods for regional assessment and exploration of oil and gas fields	To provide students with knowledge in the field of theoretical foundations, types and methods of geochemical research in assessing the prospects of oil and gas content of sedimentary basins, in the search and exploration of oil and gas deposits, as well as to provide an understanding of the need for an integrated approach to the problem of qualitative and quantitative prediction of oil and gas content of natural reservoirs, as well as the role of geochemical studies and methods in the overall complex of geological exploration on oil and gas.	PD	VK	5	+		+			+	+	
6	GEO329 Integration of modern methods of research, forecasting and exploration of oil and gas fields	Obtaining knowledge by doctoral students on the theoretical foundations of forecasting the oil and gas potential of the subsurface, regularities and geological factors that control the location of oil and gas accumulations in the lithosphere, the principles of designing and conducting regional and detailed geological and geophysical works, planning and setting up exploration, incl. drilling operations, the necessary preparation of geological graphic documentation using mathematical methods, modeling, taking into account environmental issues.	PD	VK	5			+	+	+		+	+
7	MNG350 Sustainability Science	Objective: to develop a deep understanding among doctoral students of the interactions between natural and social systems, as well as to develop skills for identifying and developing strategies for sustainable development that promote long-term human well-being	BD	KV	5	+		+	+		+		

		and environmental preservation. Content: complex interconnections between ecosystems and societies, as well as an in-depth analysis of sustainability issues at local, national, and international levels.											

5. Curriculum of the educational program

KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K.I. SATPAYEV

NON-PROFIT JOINT STOCK COMPANY
"KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY NAMED AFTER K.I. SATBAYEV"

SATBAYEV UNIVERSITY

«APPROVED»
Decision of the Academic Council
NPJSC«KazNRTU
named after K.Satbayev»
dated 06.03.2025 Minutes № 10

WORKING CURRICULUM

Academic year	2025-2026 (Spring, Autumn)
Group of educational programs	D121 - "Geology"
Educational program	8D07206 - "Oil and gas geology"
The awarded academic degree	Doctor of Philosophy PhD
Form and duration of study	full time (scientific and pedagogical track) - 3 years

Discipline code	Name of disciplines	Block	Cycle	Total ECTS credits	Total hours	lek/lab/pr Contact hours	in hours SIS (including TSIS)	Form of control	Allocation of face-to-face training based on courses and semesters						Prerequisites
									1 course		2 course		3 course		
									1 sem	2 sem	3 sem	4 sem	5 sem	6 sem	
CYCLE OF GENERAL EDUCATION DISCIPLINES (GED)															
CYCLE OF BASIC DISCIPLINES (BD)															
M-1.Module of basic training (university component)															
MET322	Methods of scientific research		BD, UC	5	150	30/0/15	105	E		5					
LNG305	Academic writing		BD, UC	5	150	0/0/45	105	E		5					
GEO351	Changing basin modding to improve the efficiency of exploration work	1	BD, CCH	5	150	30/0/15	105	E		5					
GEO338	Prediction of geological risks	1	BD, CCH	5	150	30/0/15	105	E		5					
MNG350	Sustainability Science	1	BD, CCH	5	150	30/0/15	105	E		5					
M-3.Practice-oriented module															
AAP350	Pedagogical practice		BD, UC	10				R	10						
CYCLE OF PROFILE DISCIPLINES (PD)															
M-2. Module of professional activity (component of choice)															
GEO333	Geochemical methods for regional assessment and exploration of oil and gas fields		PD, UC	5	150	30/0/15	105	E		5					
GEO329	Integration of modern methods of research, forecasting and exploration of oil and gas fields		PD, UC	5	150	30/0/15	105	E		5					
M-3.Practice-oriented module															
AAP355	Research practice		PD, UC	10				R			10				
M-4. Experimental research module															
AAP347	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	20				R	20						
AAP336	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	5				R		5					
AAP347	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	20				R			20				
AAP356	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	30				R				30			
AAP356	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	30				R					30		
AAP348	Research work of the doctoral student, including internships and doctoral dissertation		RWDS	18				R						18	
M-5.Module of final attestation															
ECA303	Writing and defending a doctoral dissertation		FA	12										12	
Total based on UNIVERSITY:									30	30	30	30	30	30	
									60		60		60		

Number of credits for the entire period of study

Cycle code	Cycles of disciplines	Credits			
		Required component (RC)	University component (UC)	Component of choice (CCH)	Total

GED	Cycle of general education disciplines	0	0	0	0
BD	Cycle of basic disciplines	0	20	5	25
PD	Cycle of profile disciplines	0	20	0	20
Total for theoretical training:		**0**	**40**	**5**	**45**
RWDS	Research Work of Doctoral Student				123
ERWDS	Experimental Research Work of Doctoral Student				0
FA	Final attestation				12
TOTAL:					**180**

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Minutes № 3 dated 20.12.2024

Decision of the Academic Council of the Institute. Minutes № 3 dated 28.11.2024

Signed:

Governing Board member - Vice-Rector for Academic Affairs — Uskenbayeva R. K.

Approved:

Vice Provost on academic development — Kalpeyeva Z. B.

Head of Department - Department of Educational Program Management and Academic-Methodological Work — Zhumagaliyeva A. S.

Director - Geology and Oil-gas Business Institute named after K. Turysov — Auyelkhan Y. .

Acting Department Chair - Hydrogeology, Engineering and Oil and Gas Geology — Akpanbayev R. C.

Representative of the Academic Committee from Employers ____Acknowledged____ — Paragulgov T. K.