Institute of Technical Automation and Information TechnologiesКафедра "Cybersecurity, information processing and storage"

EDUCATIONAL PROGRAM

8D06103 «Management Information Systems
Doctor of Philosophy (PhD)
in the field of Information and Communication Technologies

Code and classification of the field of education:
8D06 - Information and communication technologies
Code and classification of training areas:
8D06103 Management Information Systems
Group of educational programs:
D094 Information Technology
NRK Level: **8**
ORC Level:: **8**
Duration of study: **3**
olume of credits: **180**

Aimaty, 2025

The educational program 8D06103 - "Management Information Systems" was approved at the meeting of the Academic Council KazNTU of after K.I.Satpayev.

Protocol no. №10 from "_06__" __03__2025 ..

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

Protocol no.№3 from "_20__" _12___ 2024

The educational program "8D06103 - "Management Information Systems" was developed by the academic committee in the direction D094 – "Information Technology".

	Last name first name patronymic	Post	Place of work	Signature
Chairman of the Academic Committee:				
Satybaldiyeva Ryskhan Zhakanovna	Candidate of technical sciences, professor	Associate Professor	NJSC "KazNRTU named after K.I. Satpaev",	
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Zhumagaliev Birzhan Isimovich	Candidate of technical sciences	Associate Professor	NJSC "KazNRTU named after K.I. Satpaev",	
Representatives of employers:				
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Teaching staff:				
Bostan Asylayim Erbolkyzy		3 years of study	NJSC "KazNRTU named after K.I. Satpaev"	
Bekmurat Orazmuhamed Kurmankhanuly		2 years of study	NJSC "KazNRTU named after K.I. Satpaev"	

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List of abbreviations and designations

ИS Information Systems
IEP individual training plan
EP Educational Program
NQF National Qualifications Framework
IQF Industry Qualifications Framework

1. Description of the educational program

The professional activities of graduates of the program cover the field of information systems, artificial intelligence, Big Data and Database Design. The direction of the specialty and specializations program relates to engineering and engineering.

The purpose of the educational program is to train doctoral students in basic and specialized disciplines, prepare and defend a dissertation with the achievement of relevant competencies.

In case of successful completion of the full course of doctoral studies, defense and approval of a scientific dissertation in the Ministry of Education and Science of the Republic of Kazakhstan, the graduate is awarded the degree of "Doctor of Philosophy".

Graduates' professional activities include: science, education, public administration and local government, economics and finance, industry, agriculture, culture, and healthcare. The objects of professional activity of graduates of doctoral programs in the specialty 6D070300 - "Information Systems" are:

IT departments and departments of public authorities;

− IT departments and departments of industrial enterprises;

− IT departments and departments of financial organizations, etc.;

− information services of scientific institutions;

− information services of public authorities;

− academic institutions.

The main functions of graduates' professional activities are:

design, operation, administration, maintenance, testing, provision of hardware and software protection of information systems for various purposes.

The areas of professional activity are as follows:

− development, implementation and operation of information retrieval systems;

− development, implementation and operation of information management systems;

− development, implementation and operation of expert systems;

− development, implementation and operation of information and organizational systems.

In the process of mastering the educational program, a PhD in information systems must acquire the following key competencies.

A PhD doctor should:

-have an idea: on modern methods of building and developing information systems, from the point of view of current trends, trends and patterns of development of domestic and foreign science in the context of globalization and internationalization;

- about modern software tools for research and modeling and for designing information systems;

- about modern technical means used to build information systems;

- about the main stages of development and paradigm shift in scientific knowledge;

- about the subject, methodological specifics of technical sciences in the field of information systems;

- about scientific schools in the field of information systems, their theoretical and practical developments;

- about scientific concepts of world and Kazakh science in the field of information systems

be able to:

- to organize, plan and implement the scientific research process;

- analyze, evaluate and compare various theoretical concepts in the field of information systems research and draw conclusions;

- analyze and process information from different sources;

- to conduct independent scientific research that characterizes academic integrity based on modern theories and methods of analysis;

- generate your own new scientific ideas;

- bring your knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge;
- choose and effectively use a modern research methodology;
- plan and predict their further professional development
- to analyze, formulate problem statements, develop athematic models, conduct modeling to study the functioning of information systems using modern software products;
- carry out analysis, formulate problem statements, develop algorithmic and software for information systems;

o know:

- current trends, directions and patterns of development of Russian science in the field of information systems in the context of globalization and internationalization;
- methodology of scientific knowledge in the field of information systems;
- achievements of world and Kazakh science in the field of information systems;
- modern methods of building and analyzing the functioning of information systems in various industries;
- current development trends, forecast estimates of the use of technical means and systems;
- standards, methodological and regulatory materials accompanying the conduct of scientific research, design, commissioning and operation of information systems;
- modern methods of building and analyzing the functioning of information systems in various industries;
- current development trends, forecast estimates of the use of technical means in information systems;
- standards, methodological and regulatory materials accompanying research, design, commissioning and operation of information systems in various industries.

have the skills:

- critical analysis, evaluation and comparison of various scientific theories and ideas;
- analytical and experimental research activities;
- planning and forecasting of research results;
- public speaking and speaking at international scientific meetings, conferences and seminars;
- scientific writing and scientific communication;
- planning, coordination and implementation of the research process;
- systematic understanding of the research area and demonstration of the effectiveness of selected qualitative and scientific methods;
- organization of scientific research in the field of information systems; - organization of work on the collection, storage and processing of information used in the field of information systems.

Graduates' professional activities include: science, education, public administration and local government, economics and finance, industry, agriculture, culture, and healthcare.

Doctor of Philosophy 6D070300 - specialty "Information Systems" can provide services to government agencies, industrial enterprises, financial organizations and academic institutions.

The objects of professional activity of graduates are:

- computer services of public authorities;
- computer services of industrial enterprises;
- computer services of financial organizations, etc.;
- information services of scientific institutions;
- information services of public authorities;
- academic institutions; The main functions of graduates' professional activities are:

design, operation, administration, maintenance, testing, provision of hardware and software protection of information systems for various purposes.

The areas of professional activity are as follows:

- development, implementation and operation of information retrieval systems;

- development, implementation and operation of information management systems;
- development, implementation and operation of expert systems;
- development, implementation and operation of information and organizational systems.

A PhD in information systems should solve the following tasks in accordance with the types of professional activity.

in the field of organizational and managerial activities:

- be the head of an IT department, department, department;

in the field of experimental research activities:

- to be the head of a scientific laboratory for conducting theoretical and experimental research of IT facilities;

in the field of scientific research and teaching activities:

- be a leading researcher or head of a scientific laboratory for the research and development of modern information technologies and systems;
- to be a teacher of bachelor's, master's and doctoral studies in special disciplines in the field of information systems;

in the field of design and engineering activities:

- be the head of the information systems development and design department in various industries. Scientific internships are provided during the training:

University of Ottawa, Canada; National Aviation University, Kiev, Ukraine; Faculty of Engineering, University Putra Malasia.

The purpose and objectives of the educational program

The purpose of the educational program is to train doctoral students in basic and specialized disciplines in the field of information systems, prepare and defend a dissertation with the achievement of relevant competencies.

2. Types of work. Graduates' professional activities include: science, education, public administration and local government, economics and finance, industry, agriculture, culture, and healthcare.

3. Objects of professional activity. The objects of professional activity of graduates of doctoral programs in OP are:

- IT departments and departments of public authorities;
− IT departments and departments of industrial enterprises;
− IT departments and departments of financial organizations;
− information services of scientific institutions;
− information services of public authorities;
− academic institutions.

The main functions of graduates' professional activities are: design, operation, administration, maintenance, testing, and operation of information systems for various purposes.

The areas of professional activity are as follows:

− development, implementation and operation of information retrieval systems;
− development, implementation and operation of information management systems;
− development, implementation and operation of expert systems;
development, implementation and operation of information and organizational systems.

The global goal of the educational program is to contribute to the achievement of the Sustainable Development Goals (SDGs):

- Goal 4: Quality education (Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all);
- Goal 8: Decent work and economic growth (Promoting sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all);

- Goal 9: Industrialization, Innovation and Infrastructure (Building resilient infrastructure, promoting inclusive and sustainable industrialization and innovation);

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

Requirements for key competencies of doctoral graduates:

1) have an idea of: – the main stages of development and paradigm shift in the evolution of science;

– on the subject, ideological and methodological specifics of the natural (social, humanitarian, economic) sciences;

– about scientific schools of the relevant branch of knowledge, their theoretical and practical developments;

– about scientific concepts of world and Kazakh science in the relevant field;

– on the mechanism of implementation of scientific developments in practical activities;

– on the norms of interaction in the scientific community;

– about the pedagogical and scientific ethics of a research scientist;

2) know and understand:

– current trends, trends and patterns of development of Russian science in the context of globalization and internationalization;

– methodology of scientific knowledge;

– achievements of world and Kazakh science in the relevant field;

– (realize and accept) the social responsibility of science and education;

– perfect foreign language for scientific communication and international cooperation;

3) be able to:

– to organize, plan and implement the scientific research process;

– analyze, evaluate and compare various theoretical concepts in the field of research and draw conclusions;

– analyze and process information from various sources;

– to conduct independent scientific research, characterized by academic integrity, based on modern theories and methods of analysis;

– generate your own new scientific ideas, communicate your knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge;

– to choose and effectively use modern research methodology;

– plan and predict your further professional development;

4) have the skills:

– critical analysis, evaluation and comparison of various scientific theories and ideas;

– analytical and experimental scientific activities;

– planning and forecasting of research results;

– public speaking and public speaking at international scientific forums, conferences and seminars;

– scientific writing and scientific communication;

– planning, coordinating and implementing scientific research processes;

– a systematic understanding of the field of study and demonstrate the quality and effectiveness of selected scientific methods;

– participation in scientific events, fundamental scientific domestic and international projects;

– leadership management and team management;

– responsible and creative attitude to scientific and scientific-pedagogical activities;

– conducting patent search and experience in the transfer of scientific information using modern information and innovative technologies;

– protection of intellectual property rights for scientific discoveries and developments;

– free communication in a foreign language;

5) be competent:

– in the field of scientific and scientific-pedagogical activity in conditions of rapid updating and growth of information flows;

– in carrying out theoretical and experimental scientific research;

– in setting and solving theoretical and applied problems in scientific research;

– to conduct a professional and comprehensive analysis of problems in the relevant field;

– in matters of interpersonal communication and human resource management;

– in matters of university training of specialists;

– in carrying out the expertise of scientific projects and research;

– to ensure continuous professional growth.

Requirements for the research and development of a student in the Doctor of Philosophy (PhD) program:

1) compliance with the main issues of the educational program of the doctoral program, according to which the doctoral thesis is being defended;

2) relevant and contains scientific novelty and practical significance;

3) it is based on modern theoretical, methodological and technological achievements of science and practice;

4) it is based on modern methods of data processing and interpretation using computer technology;

5) performed using modern scientific research methods;

6) contains research (methodological, practical) sections on the main protected provisions.

3.3 Requirements for the organization of practices:

The practice is conducted with the aim of developing practical skills in scientific, scientific, pedagogical and professional activities.

The educational program of the doctoral program includes:

1) pedagogical and research practice – for students of the PhD program;

2) industrial practice – for students of the specialized doctoral program.

During the period of pedagogical practice, doctoral students, if necessary, are involved in conducting undergraduate and graduate studies.

The doctoral student's research practice is conducted with the aim of studying the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as consolidating practical skills, applying modern research methods, processing and interpreting experimental data in dissertation research.

The doctoral student's internship is conducted in order to consolidate the theoretical knowledge gained during the training process and improve his professional level.

The content of research and production practices is determined by the topic of the doctoral thesis.

4. Passport of the educational program

4.1. General information

№	Field name	Note

1	Code and classification of the field of education	8D06 Information and communication technologies
2	Code and classification of training areas	8D061 Information and communication technologies
3	Group of educational programs	D094 Information technology
4	Name of the educational program	8D06103 Management Information Systems
5	Brief description of the educational program	The educational program "Information Systems Management" (MIS) is aimed at training specialists who are able to effectively manage information technologies and systems in various organizations. The program combines technical and managerial disciplines, providing students with in-depth knowledge of information and communication technologies, as well as their applications in business.
6	Purpose of the EP	Training of competent scientific, pedagogical and managerial personnel, senior managers in information technology who have practical experience, as well as those interested in conducting applied research to master and develop modern concepts and models in information systems
7	Type of EP	new
8	The NRK level	8
9	ORC Level	8
10	Distinctive features of the EP	no
11	List of educational program competencies:	*have an idea:* - on modern methods of building and developing information systems, from the point of view of current trends, trends and patterns of development of domestic and foreign science in the context of globalization and internationalization; - about modern software tools for research and modeling and for designing information systems; - about modern technical means used to build information systems; - about the main stages of development and paradigm shift in scientific knowledge; about the subject, methodological specifics of technical sciences in the field of information systems; - about scientific schools in the field of information systems, their theoretical and practical developments; - about scientific concepts of world and Kazakh science in the field of information systems *be able to:* - to organize, plan and implement the scientific research process; - analyze, evaluate and compare various theoretical concepts in the field of information systems research and draw conclusions; - analyze and process information from different sources;

		- to conduct independent scientific research that characterizes academic integrity based on modern theories and methods of analysis; - generate your own new scientific ideas; - bring your knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge; - choose and effectively use a modern research methodology; - plan and predict their further professional development - to analyze, formulate problem statements, develop athematic models, and conduct modeling to study the functioning of information systems using modern software products; - to carry out analysis, formulate problem statements, develop algorithmic and software for information systems; *To know:* - current trends, directions and patterns of development of Russian science in the field of information systems in the context of globalization and internationalization; - methodology of scientific knowledge in the field of information systems; - achievements of world and Kazakh science in the field of information systems; - modern methods of building and analyzing the functioning of information systems in various industries; - current development trends, forecast estimates of the use of technical means and systems; - standards, methodological and regulatory materials accompanying the conduct of scientific research, design, commissioning and operation of information systems; - modern methods of building and analyzing the functioning of information systems in various industries; - current development trends, forecast estimates of the use of technical means in information systems; - standards, methodological and regulatory materials accompanying research, design, commissioning and operation of information systems in various industries. *have the skills:* - critical analysis, evaluation and comparison of various scientific theories and ideas; - analytical and experimental research activities; - planning and forecasting of research results; - public speaking and speaking at international scientific meetings, conferences and seminars; - scientific writing and scientific communication; - planning, coordination and implementation of the research process; - systematic understanding of the research area and demonstration of the effectiveness of selected qualitative

		and scientific methods; - organization of scientific research in the field of information systems; - organization of work on the collection, storage and processing of information used in the field of information systems. Graduates' professional activities include: science, education, public administration and local government, economics and finance, industry, agriculture, culture, and healthcare. Doctor of Philosophy 8D070300 - specialty "Information Systems" can provide services to government agencies, industrial enterprises, financial organizations and academic institutions. The objects of professional activity of graduates are: - computer services of public authorities; - computer services of industrial enterprises; - computer services of financial organizations, etc.; - information services of scientific institutions; - information services of public authorities; - academic institutions; The main functions of graduates' professional activities are: design, operation, administration, maintenance, testing, provision of hardware and software protection of information systems for various purposes. The areas of professional activity are as follows: - development, implementation and operation of information retrieval systems; - development, implementation and operation of information management systems; - development, implementation and operation of expert systems; - development, implementation and operation of information and organizational systems. A PhD in information systems should solve the following tasks in accordance with the types of professional activity. *in the field of organizational and managerial activities:* - be the head of an IT department, department, department; in the field of experimental research activities: - to be the head of a scientific laboratory for conducting theoretical and experimental research of IT facilities; *in the field of scientific research and teaching activities:* - be a leading researcher or head of a scientific laboratory for the research and development of modern information technologies and systems; - to be a teacher of bachelor's, master's and doctoral studies in special disciplines in the field of information systems; in the field of design and engineering activities:

		- be the head of the information systems development and design department in various industries.
12	Learning outcomes of the educational program:	**PO1** To recognize and interpret human emotions using artificial intelligence methods. Know modern software tools for effective data mining. **PO2** Be able to organize, plan and implement the scientific research process, analyze, evaluate and compare various theoretical concepts in the field of information systems research and draw conclusions. Master foreign languages at a professional level for partnership in the interests of sustainable development. Implementation of scientific and methodological work in the field of information systems management. **PO3** Have an idea of modern methods of building and developing information systems, from the point of view of current trends, directions and patterns of development of domestic and foreign science in the context of globalization in order to promote innovation. Be able to apply modern software and hardware tools for research and modeling and for designing information systems. Coordinate work on OT projects. **PO4** Develop and implement information retrieval systems. Analyze technical capabilities, apply algorithms and methods to search, process, and store information. **PO5** Have the skills of critical analysis, evaluation and comparison of various scientific theories and ideas; analytical and experimental research activities; planning and forecasting research results. They should also be able to develop mathematical models and methods for constructing optimal control systems under random external influences, as well as justify the choice of optimization algorithms depending on the specifics of the production process. **PO6** Development and optimization of efficient algorithms for processing big data, taking into account the features of distributed systems and resource constraints. Knowledge of tools and technologies for processing big data. **PO7** Apply machine learning and statistical analysis methods to solve various data analysis problems. Work with various software tools and libraries, program data analysis algorithms, apply them to real datasets and evaluate their results.
13	The form of education	full-time
14	Duration of training	3 years
15	Volume of loans	180 credits
16	Languages of instruction	Kazakh, Russian. English
17	Academic degree awarded	Doctor of Philosophy PhD
18	Developer(s) and authors:	Serbin V.V.. Satybaldieva R.Zh.

2. The relationship between the achievability of the formed learning outcomes in the educational program and academic disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Generated learning outcomes (codes)						
				NO1	NO2	NO3	NO4	NO5	NO6	NO7
1	Scientific research methods	Purpose: to acquire knowledge about the laws, principles, concepts, terminology, content, and specific features of the organization and management of scientific research using modern methods of scientometry. Contents: the structure of technical sciences, the application of general scientific, philosophical and special methods of scientific research, the principles of scientific research organization, 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.	5	v	v			v		
2	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, conclusion, used literary sources; quoting in the text; preventing plagiarism, as well as making a presentation at a conference.	5		v					
3	Intellectual property and the global market	Purpose: to train specialists in the field of intellectual property law who are able to analyze and predict trends in its development in the global market, develop strategies for the protection and commercialization of intellectual property. Contents: global aspects of intellectual property and its role in international trade and economics, analysis of international agreements and conventions, IP management strategies, cases on protection and infringement of intellectual property rights in various	5	v	v			v		

		jurisdictions.								
4	Data mining in IS	Data mining as an interdisciplinary discipline, methodology of data mining and processing. Descriptive data analysis. Types, sets, and samples of data. Assessment of data quality. Identification of connections and analysis of connections. Dynamic models and forecasting based on data of various nature. Assessment of the quality of models. Methodology of intellectual analysis of various data in practice and scientific research.	5	v					v	v
5	Big Data Processing	The study of theoretical and practical aspects of the use of big data technologies in information systems. Models with a unified memory access system and a non-unified one are considered. Strongly coupled and weakly coupled distributed computing systems. The problems of stability of such systems and the definition of computing power.	5	v			v		v	v
6	Information search engines	The discipline covers various aspects related to the construction and use of search engines. It includes: the study of indexing algorithms that are used to organize information in search engines; the process of information retrieval; the analysis of user queries, the comparison of queries with indexed information and the ranking of search results; methods and techniques of information retrieval in various sources, including web pages, databases, multimedia resources and other data sources..	5				v			v
7	Computer modeling of processes and systems	Modeling of unstable parameters and processes formalized as continuous, discrete, multidimensional random variables and Markov, Gaussian processes. Modeling of ordinary and extraordinary flows of events. Identification of random patterns. Simulation of queuing systems with waiting. Modeling of investment allocation in conditions of uncertainty and risks. Modeling of inventory management systems.	5			v		v		

8	Applied optimization methods	The study of methods of classical optimization of processes described by differentiable functions, modern trends in mathematical programming based on the theory of duality, as well as a wide range of network tasks. The procedures for using standard structures and models for the analysis and optimization of economic, production and organizational processes under accidental external influences and incomplete information about state variables are considered.	5			**v**		**v**		
9	Emotional Artificial Intelligence	The discipline includes the study of the basics of artificial intelligence and their practical application. The collection, analysis, extraction of useful information, and construction of a machine learning model will be considered. The purpose of studying the discipline "Emotional Intelligence" is to provide doctoral students with theoretical and practical knowledge, skills and emotional competence in managing value chains, as well as the formation of emotionally competent behavior necessary for the professional activity of a high-level specialist based on the consideration of the emotional factor in the business processes of modern companies.	5	**v**			**v**		**v**	
10	Machine Learning & Deep Learning	The course is a comprehensive study of a class of machine learning algorithms such as convolutional, recurrent, and recursive neural networks. Combining these methods, complex systems are created that meet various tasks of artificial intelligence. Deep learning is a proven sample from a wide family of machine learning methods for representing data that best suits the nature of the task.								v

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"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: D094 - "Information technologies"
Educational program: 8D06103 - "Management of information systems"
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)															
CSE339	Research methodology		BD, UC	5	150	30/0/15	105	E		5					
LNG305	Academic writing		BD, UC	5	150	0/0/45	105	E		5					
CSE333	Big Data Processing	1	BD, CCH	5	150	30/0/15	105	E		5					
SEC302	Intelligent data analysis in information systems	1	BD, CCH	5	150	30/0/15	105	E		5					
MNG349	Intellectual property and the global market	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)															
CSE319	Applied optimization methods	1	PD, CCH	5	150	30/0/15	105	E		5					
CSE320	Computer modeling of processes and systems	1	PD, CCH	5	150	30/0/15	105	E		5					
CSE338	Emotional artificial intelligence	2	PD, CCH	5	150	30/0/15	105	E		5					
CSE337	Information retrieval systems	2	PD, CCH	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															
ECA325	Final examination (writing and defending a doctoral dissertation)		FA	12										12	
									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	10	10	20
Total for theoretical training:		0	30	15	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 № 4 dated 22.11.2024

Signed:

Governing Board member - Vice-Rector for Academic Affairs	Uskenbayeva R. K.
Approved:	
Vice Provost on academic development	Kalpeyeva Z. S.
Head of Department - Department of Educational Program Management and Academic-Methodological Work	Zhumagaliyeva A. S.
acting Director of Institute - Institute of Automation and Information Technologies	Chimbayev Y. T.
Department Chair - Cybersecurity, information processing and storage	Satybaldiyeva R. Zh.
Representative of the Academic Committee from Employers ___Acknowledged___	Murzabayev O. Z.