



**Educational program in the direction of preparation «8D05401- Mathematics " was developed on the basis of:**

- Law of the Republic of Kazakhstan dated July 27, 2007 № 319-III «On Education" (with as amended and supplemented on 11.07.2017),
  - Law of the Republic of Kazakhstan dated July 11, 1997 № 151-I. "On languages in the Republic of Kazakhstan" (with alterations and amendments as of 24.05.2018)
  - State compulsory standard of postgraduate education from August 31, 2018 №604
  - National Qualifications Framework by March 16, 2016 the Republican tripartite commission on social partnership and regulation of social and labor relations.
  - Order of the MES of RK "On Approval of Rules of organization of educational process on credit technology" dated October 2, 2018 №152 (as amended on 10.12.2018, № 563)
  - Classifier of training with higher and postgraduate education of 13 October 2018. №569.
  - State compulsory standard of primary education. Approved by the Government of the Republic of Kazakhstan from August 23, 2012 № 1080. Decision of the Republic of Kazakhstan dated August 15, 2017 № 484.
  - professional standards "teacher" (Appendix to the Order of the Chairman of the Board of the National Chamber of Entrepreneurs of Kazakhstan "Atameken" on June 8, 2017 № 133)
- Recommended University Academic Council's decision to introduce with effect from 1 September 2021.

## Educational program «8D05401- Mathematics»

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## **1. Passport of the educational program**

### **1.1 General information about the educational program**

**one.** Field of study: «8D05 Natural sciences, mathematics and statistics»

2. Direction of preparation: «8D054 Mathematics and Statistics»

3. Duration of training: 3 years

4. Language: Kazakh, Russian

5. Application to the state educational activity license for the activity: number 004, the date of issue "12.07.2013g."

6. Accreditation of educational programs: the Independent Kazakhstan Agency for quality assurance in education (IAQAE), No. SA-A 0156/6 certificate, date of issue "24.05.2019 city of", valid until 24.05.2024 .

7. Admission Requirements: Master of Science 7M05409201-Mathematics, Master of Education 7M01501001-Mathematics, MSc 7M06101-Informatics (Applied Mathematics)

8. Type of educational program: acting

9. Installed prerequisites for the development of the program:

- in the case of coincidence of the profile of the educational program of doctoral program of postgraduate education - not required
- in the case of not matching the profile of the educational program of doctoral program of postgraduate education: - Mathematical analysis -22 ESTC, Algebra Basics - 7 ESTC, Functional Analysis - 4 ESTC, Model theory -7 ESTC, The equations of mathematical physics - 7 ESTC

10. Data on foreign partners to implement the program:

- Agreement on cooperation between the Siberian Federal University, Russian Federation and the University them. academician EA Buketov, Kazakhstan, 04.09.2014 city - 09/04/2024 Mr.

- Agreement on international cooperation between the educational institution №30117 "Hrodna State University," The Republic of Belarus, Grodno, 08.12.2017g.. - 12.08.2027, the

- Agreement on cooperation in the field of education and science between the National Research Tomsk State University, the Russian Federation and the University them. Academician EA Buketov, Kazakhstan, of 18.1.2016 - 18.01.2026g.

- Agreement on cooperation between Omsk State Pedagogical University, the Russian Federation and the University them. Academician EA Buketov, Kazakhstan, of 29.4.2016 - 29.4.2026, the

- Agreement on cooperation between the Belarusian State University, Minsk, Republic of Belarus and Karaganda State University named after academician EA Buketov, Kazakhstan, 20.10.2018 city - 10/20/2023 Mr.

- Agreement on cooperation between the RSE on PVC "Institute of Mathematics and Mathematical Modeling" KH MES RK and the University them. academician EA Buketov, Kazakhstan, of 10.1.2018 - 10.1.2023, the

11. The main base practices of the educational program:

- teacher: Department of "Mathematical Analysis and Differential Equations" department of algebra, mathematical logic and geometry to them. prof.T.G.Mustafina

- Research: Department of "Mathematical Analysis and Differential Equations" department of algebra, mathematical logic and geometry to them. prof.T.G.Mustafina

12. The main scientific organization, the organization of relevant industries or areas of activity, including foreign ones, to conduct scientific training: Novosibirsk State University, Czech Technical University, Prague

13. The basic scientific organizations, research institutes, centers for scientific research:

- RSE on PVC "Institute of Mathematics and Mathematical Modeling" KH MES RK, Almaty

14. Possibilities for further continuation of studies

15. Employers List

number	The names of companies, enterprises, organizations	Contacts, phone, e-mail
1.	Karaganda University them. academician EABuketov	<a href="mailto:office@ksu.kz">office@ksu.kz</a> 8 (7212) 77-03-95
2.	Karaganda State Technical University	<a href="mailto:kargtu@kstu.kz">kargtu@kstu.kz</a> 8 (7212) 56-03-28
3.	Karaganda Medical Academy	<a href="mailto:info@kgmu.kz">info@kgmu.kz</a> 8 (7212) 51-34-79, 50-39-30
4.	Karaganda Economic University	<a href="mailto:mail.@keu.kz">mail. @ keu.kz</a> 8 (7212) 44-16-32
5.	Karaganda State Industrial University RSE Temirtau	<a href="http://www.kgiu.kz">www.kgiu.kz</a> 8 (7213) 91-42-34

## 2. Qualification characteristics of graduates of doctoral studies

### 2.1 List of qualifications and positions

Doctoral graduate is awarded the degree of «Doctor of Philosophy (PhD)» of the educational program «8D05401- Mathematics". Position: Teacher, University lecturer

### 2.2 Scope of professional activities

The sphere of professional activity of graduates of the educational program «8D05401- Mathematics"

They are:

- higher education institutions,

- research institutes,

- design, technological and design organizations,
- bodies of the state administration system.

### **2.3 Objects of professional activity**

The objects of professional activity of doctors in the educational program «8D05401- Mathematics" include:

- pedagogical process of high schools,
- methodical and administrative work in educational institutions;
- research and development in areas related to the use of mathematics.

### **2.4 Subject of professional activity**

The subject of professional activity of graduates of the educational program «8D05401- Mathematics" include:

- scientific research in the fields using mathematical methods and computer technology;
- various applications using mathematical modeling of processes and objects and software;
- the development of effective methods for solving problems of natural science, engineering, economics and management;
- software and information support of science, research and management activities;
- the teaching of mathematical disciplines, the organization of educational process in higher educational institutions and other educational organizations.

### **2.5 Types of professional activities:**

- Educational (teaching a master, doctoral thesis);
- research and development;
- administration and management (analyst, a strategist in science, education and high technologies);
- expert and advisory (examination papers and projects, scientific management master's thesis, the use of elements of innovation in science and technology).

### **2.6 Functions of professional activity:**

- training,
- educate,
- methodical,
- research,
- socio communicative

### **2.7 Typical tasks of professional activity**

- knowledge of the philosophy of science and education;

- knowledge of the methodology of psychological and educational research;
  - Knowledge of the Higher School of Pedagogy;
  - knowledge of psychology students;
  - knowledge of the characteristics of the educational process in high school;
  - Knowledge of principles and methods for the integration of social values in the formation of professionally significant qualities
- future professionals;
- knowledge of the methodology of basic and applied research in the field of mathematics;
  - knowledge of drafting techniques and the development of research projects;
  - the development of new knowledge in the field of mathematics theory and methodology of professional education;
  - Forecasting the results of research conducted in the context of social, economic and environmental implications of scientific findings into practice;
  - guide research students, undergraduates, doctoral students
  - initiation of professional interaction with colleagues and foreign partners to improve education practice;

### **2.8 The content of professional activity**

- carrying out all kinds of activities at the university based on the integration of knowledge in the field of mathematics and didactics of the higher school;
- carrying out all kinds of activities with the use of innovative technologies of formation of professional competence of students and researchers;
- determination of the individual paths of education of students, researchers, taking into account global trends and strategies for the development of higher education
- integriratsiya contents of linguistic and non-linguistic disciplines within the educational programs of higher and post-graduate education in view of the preparation of multilingual staff;
- definition content of the course (module);
- development and implementation of educational programs of higher education specialties, as well as the preparation of multilingual staff

### **3. The purpose of the educational program**

The aim of the educational program is to prepare, taking into account the prospects of development of competitive specialists of new formation, possessing fundamental knowledge, innovative approaches, research skills for scientific, educational, profes-

sional and practice in higher education institutions, educational authorities, educational institutions, research centers . Conceptual bases of national education at the doctoral level, provide a broad basic training, which should be aimed at achieving the fundamental subject knowledge for future specialists. This should provide the doctor a total integrated methodology of professional activities, to develop future specialists capable of professional creativity, create the need for a further increase in the educational level.

### **3.1 The overall objective of the educational program:**

Training of qualified specialists for the development of economy, industry and culture of the Republic of Kazakhstan, creation of conditions for full-fledged education, professional competence in the field of education and science ..

### **3.2 The purpose of the basic disciplines of cycle**

To study the basic cycle disciplines aggregate formation is fundamental knowledge on general theoretical mathematical disciplines, as well as an understanding of the relationship between the theoretical analysis and empirical data.

### **3.3 The purpose of the cycle majors**

- formation of basic knowledge on general theoretical mathematical disciplines;
- understanding of the relationship between the theoretical analysis and the empirical data;
- the ability to apply theoretical knowledge and practical skills to solve applied problems.
- the ability to independently use theoretical and practical knowledge for formulating and solving research problems;
- the ability to independently implement the results of research into the practical teaching activities;
- independently and in collaboration with colleagues to carry out testing of results of research;
- in collaboration with colleagues to plan and carry out research in the mathematical sciences for the improvement of education practice.

### **3.4 The purpose of the research / experimental and research work**

The main aim of doctoral research practice is:

- the study of the latest theoretical, methodological and technological achievements of domestic and foreign science and securing of practical skills of application of modern methods of scientific research;
- production of new science-based theoretical and (or) experimental results that address the theoretical and applied problem or a major achievement in the field of mathematics;
- the development of international best practices in the field of mathematics.

### **3.5 The purpose of the final certification**



#### 4. Key competencies of the graduate

Competency key	The description of the competences
Personal competences	
PC1	ability to follow ethical standards in professional activities
PC2	ability to plan and solve problems of own professional and personal development
PC3	readiness to use modern methods and technologies of scientific communication in the state and foreign languages
Specialized competences	
SC1	Ability to design and carry out complex researches, including interdisciplinary, on the basis of integral system scientific outlook with use of knowledge in the field of the analysis and differential equations
SC2	Ability to design and carry out complex research, including interdisciplinary, on the basis of a holistic system of scientific worldview using knowledge in the field of algebra, geometry and logic
SC3	ability to independently carry out research activities in the field of integrated transformations and their applications using modern research methods and information and communication technologies
SC4	ability to independently carry out research activities in the field of model theory using modern research methods and information and communication technologies
SC5	ability to independently carry out research activities in the field of the theory of boundary value problems for differential equations of hyperbolic type using modern research methods and information and communication technologies
SC6	ability to independently carry out research ability to independently carry out research activities in the field of the theory of absolute summability of series using modern research methods and information and communication technologies
SC7	ability to critically analyze and evaluate modern scientific achievements, generate new ideas in solving research and practical problems, including in interdisciplinary areas
SC8	willingness to participate in the work of domestic and international research teams to solve scientific and educational problems
SC9	readiness for teaching on the main educational programs of higher education

#### 5. Key learning outcomes

Learning outcomes characterize the ability of the student and are reflected through the Descriptors:

- 1) demonstrate a systematic understanding of the field of study, mastering the skills and research methods used in this area;
- 2) demonstrate the ability to think, design, implement and adapt an essential research process with a scientific approach;
- 3) to contribute with their own original research to the expansion of the boundaries of the scientific field, which deserves publication at the national or international level;
- 4) critically analyze, evaluate and synthesize new and complex ideas;

Learning result code	Result
LR1	<b>Knows:</b> social strategies that take into account generally accepted ethical standards, their features and methods of implementation in solving professional problems
LR 2	<b>Can:</b> to establish professional contacts on the basis of ethical norms and values in order to achieve mutual understanding on the basis of tolerance
LR 3	<b>Can:</b> to make personal choices in various professional and moral-value situations, to assess the consequences of the decision and to be responsible for it before yourself and society
LR 4	<b>Owens:</b> ways to identify and evaluate ethical, professionally significant qualities and ways to achieve a higher level of their development
LR 5	<b>Knows:</b> the content of the process of goal-setting of professional and personal development, its features and methods of implementation in solving professional problems, based on the stages of career growth and labor market requirements.
LR 6	<b>Can:</b> formulate goals of personal and professional development and the conditions for their achievement, based on the trends of development of the field of professional activity, stages of professional growth, individual and personal characteristics
LR 7	<b>Can:</b> to make personal choices in various professional and moral-value situations, to assess the consequences of the decision and to be responsible for it before yourself and society
LR 8	<b>Owens:</b> methods of identification and evaluation of individual and personal, professional and significant qualities and ways to achieve a higher level of their development
LR 9	<b>Knows:</b> methods and technologies of scientific communication in the state and foreign languages
LR 10	<b>Knows</b> stylistic features of presentation of the results of scientific activity in oral and written form in the state and foreign languages
LR 11	<b>Can:</b> follow the basic rules adopted in scientific communication in the state and foreign languages
LR 12	<b>Owens:</b> skills of analysis of scientific texts in the state and foreign languages
LR 13	<b>Knows:</b> research methods
LR 14	<b>Knows:</b> Basic concepts of modern science, the main stages of the evolution of science, functions and foundations of the scientific picture of the world
LR 15	<b>Can:</b> use the provisions and categories of science for the analysis and evaluation of various facts and phenomena
LR 16	<b>Owens:</b> skills of analysis of the main ideological and methodological problems, including interdisciplinary nature, arising in science at the present stage of its development
LR 17	<b>Owens:</b> planning technologies in professional activities in the field of scientific research
LR 18	<b>Knows:</b> theoretical bases of the organization and carrying out researches in the field of professional activity
LR 19	<b>Can:</b> use modern research tools in the field of professional activity
LR 20	<b>Owens:</b> culture of scientific research, including the use of modern information and communication technologies
LR 21	<b>Knows:</b> methods of critical analysis and evaluation of modern scientific achievements, as well as methods of generating new ideas in solving research and practical problems, including in interdisciplinary fields
LR 22	<b>Can:</b> analyze alternative solutions to research and practical problems and evaluate the potential gains/losses of the implementation of

	these options
LR 23	<b>Can:</b> in solving research and practical problems to generate new ideas that can be operationalized based on available resources and constraints
LR 24	<b>Owens:</b> skills of analysis of methodological problems arising in solving research and practical problems, including in interdisciplinary areas
LR 25	<b>Owens:</b> skills of critical analysis and evaluation of modern scientific achievements and results of activities to solve research and practical problems, including in interdisciplinary areas
LR 26	<b>Knows:</b> features of presentation of the results of scientific activity in oral and written form when working in domestic and international research teams
LR 27	<b>Can:</b> follow the standards adopted in scientific communication when working in domestic and international research teams in order to solve scientific and educational problems
LR 28	<b>Can:</b> to make personal choices in the process of work in domestic and international research teams, to assess the consequences of the decision and be responsible for it to themselves, colleagues and society
LR 29	<b>Owens:</b> skills of the analysis of the main world Outlook and methodological problems, including interdisciplinary character arising at work on the solution of scientific and educational problems in domestic or international research collectives
LR 30	<b>Owens:</b> technology assessment of the results of collective action on the solution of scientific and scientific-educational challenges, including ongoing foreign language
LR 31	<b>Owens:</b> technologies of planning activities in the framework of work in domestic and international teams to solve scientific and educational problems
LR 32	<b>Owens:</b> various types of communication in the implementation of work in domestic and international teams to solve scientific and educational problems
LR 33	<b>Knows</b> basic methods of planning and organization of teaching activities
LR 34	<b>Can:</b> plan and conduct collective classes on the main educational programs of higher education
LR 35	<b>Owens:</b> design technology of the educational process at the level of higher education



## 7. Competency map

Module code	Module Name	Codes of discipline module	The name of the discipline	Code of result of tutoring	Competence Code
1	2	3	4	5	6
SOM-1	Actual problems of mathematics	AW1201	Academic writing (in English)	LR4, LR8, LR9, LR10, LR11, LR12	SC1
		RM1202	Research Methods		
SOEM-2	Selected questions of fundamental mathematics	ITTA1203 OC1203	Integral transformations and their applications Operational calculus	LR4, LR8, LR9, LR10, LR11, LR12	SC3
TAS-3	Practice	PP	Pedagogical practice	LR1, LR2, LR3, LR4, LR5, LR6, LR7, LR11, LR12	PC1, PC2, PC3, SC9
SOM-4	Actual problems of mathematics (continued)	APFDM1304	Actual problems of fundamental directions of mathematics	LR4, LR8, LR9, LR10, LR11, LR12	SC2
SOEM-5	Select questions of fundamental mathematics (continuation)	SQTM1305 SQA1305	Select questions of theory of models (in English language) Select questions of algebra (in English language)	LR4, LR8, LR9, LR10, LR11, LR12	SC4
TAS-6	Practice	RP2300	Research practice	LR4, LR8, LR9, LR10, LR11, LR12	SC7
TAS-7	Doctoral student research work, including internship and doctoral dissertation	DSRWIIDD1300	Doctoral student research work, including internship and doctoral dissertation	LR1, LR2, LR3, LR4, LR5, LR6, LR7, LR11, LR12	PC1, PC2, PC3, SC7, SC9
FST-8	Final certification	WDDD3300	Writing and defence of doctoral dissertation	LR1, LR2, LR3, LR4, LR5, LR6, LR7, LR11, LR12	PC1, PC2, PC3, SC1, SC2, SC3, SC4, SC5, SC6, SC7, SC8

## 8. Content of the educational program

### 8.1 Map of the educational program

Code of module	Cycle and component	Code of discipline	Form of control	Semester	ESTC	EO on the module
Course 1						
SOM-1	BD / UC	AW1201	exam	1	5	<p><i>Knowledge:</i> basic definitions and formulations of the most important results of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems, complete proofs of the most important statements and theorems, and methods for obtaining modern research results</p>
		RM1202	exam		5	<p><i>Know-how:</i> apply modern methods and results of the theory of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems in research work</p> <p><i>Skills:</i> research work in the field of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems</p> <p><i>Competences:</i> PC1</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of ideas about the methods of research in the field of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems</li> <li>- the use of modern methods and results of the theory of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems in research work</li> <li>- application of research skills in the field of academic writing (in English) / of the results of scientific research in the field of mathematics through the use of a set of research methods in solving specific research problems</li> </ul>

SOEM-2	BD /CC	ITTA1203 OC1203	exam	1	5	<p><i>Knowledge:</i> basic definitions and formulations of the most important results of the modern theory of fundamental mathematics (integral transformations and their applications), complete proofs of the most important statements and theorems, and methods for obtaining modern research results in the field of fundamental mathematics (integral transformations and their applications)</p> <p><i>Know-how:</i> to apply modern methods and results of the theory of fundamental mathematics (integral transformations and their applications) in research work</p> <p><i>Skills:</i> research work in the field of fundamental mathematics (integral transformations and their applications/)</p> <p><i>Competences:</i> PC2/ PC3</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of ideas about the methods of research activities in the field of fundamental mathematics (integral transformations and their applications)</li> <li>- the use of modern methods and results of the theory of fundamental mA-subjects (integral transformations and their applications) in research work</li> <li>- application of research skills in the field of fundamental mathematics (integral transformations and their applications)</li> </ul>
TAS-3	BD/PR	PP		2	10	<p><i>Knowledge:</i> the order of the organization, planning, conducting and providing educational process using the latest technologies of training; the basics of pedagogical culture and skill; the basic principles, methods and forms of organization of scientific and pedagogical process at the University</p> <p><i>Know-how:</i> use educational technologies, methods and techniques of lectures, seminars and laboratory classes; use in the presentation of the subject matter of the relationship of disciplines presented in the curriculum; carry out methodological work on the organization and planning of the educational process; speak to the audience and create a creative atmosphere in the classroom</p> <p><i>Skills:</i> the technique of using technical education tools for lessons in various academic disciplines; technique of speech, rules povedeniya the sessions; the methodology and technology training</p> <p><i>Competences:</i> PC1, PC2, PC3, SC9</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of ideas about modern approaches to modeling of scientific and pedagogical activity; the basics of educational and methodical work in higher education;</li> <li>- the use of the subject material in the presentation of the relationship of research and ed-</li> </ul>

						<p>educational processes in higher education, including the possibility of attracting their own research as a means of improving the educational process; analysis of the difficulties encountered in teaching and development of an action plan to resolve them</p> <ul style="list-style-type: none"> <li>- application of technology of use of technical means of training at carrying out occupations on educational disciplines; methods of self-analysis and self-assessment of results and efficiency of carrying out classroom occupations of various types</li> </ul>
SOM-4	CD/UC	APFDM13 04	exam	1	5	<p><i>Knowledge:</i> basic definitions and formulations of the most important results of modern theory of analysis and differential equations /modern theory of algebra, geometry and logic, complete proofs of the most important statements and theorems, and methods for obtaining modern research results in the field of algebra, geometry and logic</p> <p><i>Know-how:</i> apply modern methods and results of the theory modern theory of analysis and differential equations /of algebra, geometry and logic in research work</p> <p><i>Skills:</i> research work in the field modern theory of analysis and differential equations /of algebra, geometry and logic</p> <p><i>Competences:</i> PC1, SC2</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of ideas about the methods of research in the field modern theory of analysis and differential equations /of algebra, geometry and logic</li> <li>- the use of modern methods and results modern theory of analysis and differential equations /of the theory of algebra, geometry and logic in research work</li> <li>- application of research skills in the field modern theory of analysis and differential equations /of algebra, geometry and logic</li> </ul>



SOEM-5	CD/EC	SQTM130 5 SQA1305	exam	1	5	<p><i>Knowledge:</i> basic definitions and formulations of the most important results of modern theory of fundamental mathematics (select questions of theory of models (in English language)), complete proofs of the most important statements and theorems, and methods for obtaining modern research results in the field of fundamental mathematics (select questions of theory of models (in English language))</p> <p><i>Know-how:</i> apply modern methods and results of the theory of fundamental mathematics (select questions of theory of models (in English language)) in research work</p> <p><i>Skills:</i> research work in the field of fundamental mathematics (select questions of theory of models (in English language))</p> <p><i>Competences:</i> PC3, SC4/ SC5/ SC6</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of ideas about the methods of research activities in the field of fundamental mathematics (select questions of theory of models (in English language))</li> <li>- the use of modern methods and results of the theory of fundamental mathematics (select questions of theory of models (in English language)) in research work</li> <li>- application of research skills in the field of fundamental mathematics (select questions of theory of models (in English language))</li> </ul>
TAS-7	AM/PR	DSR- WIIDD 1300		1, 2, 3, 4, 5, 6	123	<p><i>Knowledge:</i> basic methods of research activity.</p> <p><i>Know-how:</i> to identify and systematize the main ideas in scientific texts; to critically evaluate any incoming information, regardless of the source; to avoid automatic application of standard formulas and techniques in solving problems, to conduct scientific discussion, to demonstrate the ability of public speaking.</p> <p><i>Skills:</i> collection, processing, analysis and systematization of information on the topic of research; choice of methods and means of solving the problems of research conducting scientific discussion; logic of presentation, conciseness of speech; reasoned and reasonable presentation of the main provisions; construction of the report, taking into account the characteristics of the audience; the use of information technology, taking into account the peculiarities of audience perception (presentation, readability of the text, clarity of the data)</p> <p><i>Competences:</i> PC1, PC2, PC3, SC7, SC8</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the presence of an idea of the main provisions and the importance of previous studies in the development of the problem;</li> <li>- the use of various information and communication technologies required for research</li> </ul>

						and presentation of results in accordance with the objectives, taking into account the characteristics of the audience - ability to conduct scientific discussion, demonstration of public speaking skills, substantiation of practical use and implementation of own research results
Course 2						
TAS-6	CD/PR	RP2300		3	10	<p><i>Knowledge:</i> types and features of written texts and oral presentations; General content of complex texts on abstract and specific topics, including highly specialized texts,</p> <p><i>Know-how:</i> select literature on the topic, translate and refer special literature, prepare scientific reports and presentations on the basis of read special literature, highlight and systematize the main ideas in scientific texts; critically evaluate any incoming information, regardless of the source.</p> <p><i>Skills:</i> collection, processing, analysis and systematization of information on the research topic; discussion of a familiar topic, making important comments and answering questions; creating a coherent text on familiar or interesting topics, adapting it to the target audience</p> <p><i>Competences:</i> SC7</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- availability of methods of critical analysis and evaluation of modern scientific achievements, as well as methods of generating new ideas in solving research and practical problems;</li> <li>- application of skills of the analysis of the methodological problems arising at the decision of research and practical tasks, including in interdisciplinary circle</li> <li>- ability to analyze alternative solutions to research and practical problems and assess the potential gains/losses of the implementation of these options, to analyze, systematize and assimilate the best practices of scientific research</li> </ul>
Course 3						
FST-8		WDDD 3300		6	12	<p><i>Knowledge:</i> basic definitions and formulations of the most important results of the modern theory of fundamental mathematics, complete proofs of the most important statements and theorems, and methods for obtaining modern research results in the field of fundamental mathematics</p> <p><i>Know-how:</i> broadcast knowledge on the basis of creative analysis of scientific and methodological literature, to draw up in accordance with the existing requirements of the reporting documentation, scientific and qualification work ( thesis research), scholarly paper.</p>

					<p><i>Skills:</i> work with bibliographic reference books, preparation of scientific and bibliographic lists, the use of bibliographic descriptions in scientific works, design and implementation of complex research knowledge of modern methods and principles of development of scientific problems on the topic of scientific qualification work</p> <p><i>Competences:</i> PC1, PC2, PC3, SC1, SC2, SC3, SC4, SC5, SC6, SC7, SC8</p> <p><i>Evaluation criterion:</i></p> <ul style="list-style-type: none"> <li>- the ability to design and carry out complex research, including interdisciplinary, on the basis of a holistic system of scientific worldview with the use of knowledge in the field of fundamental mathematics;</li> <li>- application of skills of the analysis of the methodological problems arising at the decision of research and practical tasks, design and implementation of complex researches, including interdisciplinary, on the basis of integral system scientific Outlook with use of knowledge in the field of fundamental mathematics</li> <li>- ability to present scientific and qualification work (thesis research) using multimedia, to give clear and complete answers to the questions asked; to give clear analytical conclusions supported by the theory</li> </ul>
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## 8.2 The summary table on the volume of the educational program

Course of Study	Semester	Number of modules to be mastered	Number of disciplines studied		Number of credits						Total in hours	ECTS	Amount	
			CU	ES	Theoretical classes	Ped. Practice	Research practice	SRWD	Final attestation	Total			Exam	Graded test
1	1	4	3	2	25			5		30	900	30	5	2
	2					10		20		30	900	30		3
2	3	2					10	20		30	900	30		3
	4							30		30	900	30		2
3	5	1						30		30	900	30		2
	6	2						18	12	30	900	30		2
<b>Total</b>		<b>5</b>	<b>3</b>	<b>2</b>	<b>25</b>	<b>10</b>	<b>10</b>	<b>123</b>	<b>12</b>	<b>180</b>	<b>5400</b>	<b>180</b>	<b>5</b>	<b>14</b>

### Originators:

Head of the department Mathematical analysis and differential equations \_\_\_\_\_ Bitimkhan C.

### It is coordinated:

Chairman of the methodical commission of faculty \_\_\_\_\_ U.A. Kosybayeva

### Notes.

The curriculum is reviewed at the meeting of the department and recommended for approval 14.05.2024 protocol № 4

The educational program is considered at a meeting of SMC and is recommended for a statement from 24.05.2024 Protocol № 5.1

The educational program is reviewed at the meeting of the Scientific and Methodological Council of the University and recommended for approval 04.06.2024 protocol № 18

The educational program is considered and approved at a meeting of the Academic council from 04.06.2024 Protocol № 18

Member of the Management Board –

Vice-Rector for Research

Acting Member of the Management

acting Vice-rector for Academic Affairsk

Head of post-graduate education department

Dean of faculty of mathematics and information technologies

\_\_\_\_\_ E.M. Tazhbaev

\_\_\_\_\_ B.R. Nusupbekov

\_\_\_\_\_ S.G. Karstina

\_\_\_\_\_ D.A. Kazimova