

Scientific works of the Department of Higher Mathematics

Scientific work and projects of the Department of Higher Mathematics

The main results of the executed scientific works at the chair for the academic year and their implementation in the educational process and training of scientific-pedagogical staff:

1.1 Executed scientific works of initiative research works

1) **Name of the theme: Development of theoretical bases and methods of practical application of innovative technologies in mining and metallurgical industry.**

Grounds for fulfilment: initiative.

Scientific supervisor: S.Sh. Kazhikenova, Doctor of Technical Sciences, Prof.

Main results:

A complex of analytical and experimental studies has been carried out. The dynamics of deformation processes development in the coal-rock massif around the mine workings has been established. Unstable areas in the host rocks and dynamics of active cracking propagation zones both in front of the excavation front and on its sides are determined, which allows to control the course of geomechanical processes in the excavation contour massif and to influence it to overcome undesirable manifestations of rock pressure and to ensure stability of the supported excavations.

2) **Project name: AP14869933 ‘Statistical Analysis and Information Processing for Scientific Research Works’ for distance education.**

Grounds for fulfilment: state budget.

Scientific supervisor: N.F. Abaeva, Candidate of Pedagogical Sciences, Acting Assistant Professor of the VM Department.

Main results:

According to the calendar plan the following work was done:

1. **Certificate of state registration of rights to the object of copyright:**

1.1 № 44067 from 29.03.2024 ‘Elements of mathematical modelling’, author Abaeva N.F.;

1.2 № 46280 from 23.05.2024 ‘Elements of probability theory. Basic concepts of the theory’, authors: Mustafina L.M., Zhurov V.V., Yarullina A.R.

2. Within the framework of work on the project, an article in English was published in the republican scientific and technical journal ‘Proceedings of the University’, recommended by Science and Higher Education Quality Assurance Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

3) The name of the theme: AP23486482 ‘Development of information models of management of technological processes of metallurgical production, monitoring of their functioning’. The contract was signed in October of the current year.

Grounds for fulfilment: state budget.

Scientific supervisor: S.S. Kazhikenova, Doctor of Technical Sciences, Professor

1.2 Scientific work with students

Students under the guidance of faculty members of the department participated in the Republican Student Scientific Conference ‘Contribution of youth science in the implementation of the Strategy “Kazakhstan-2050”, dedicated to the 125th anniversary of Academician K.I. Satpayev, 11-12 April 2024, Kartu named after Abylkas Saginov - 7 reports (8 students).

Ruslan Ruslanovich Zagidullin (SIB-23s) was awarded the diploma of the third degree of VII International competition of scientific works and creative projects of students and graduate students on the use of ICT (Karaganda University named after academician E.A. Buketov, 14-15 March, 2024), supervisor: V.V. Zhurov.



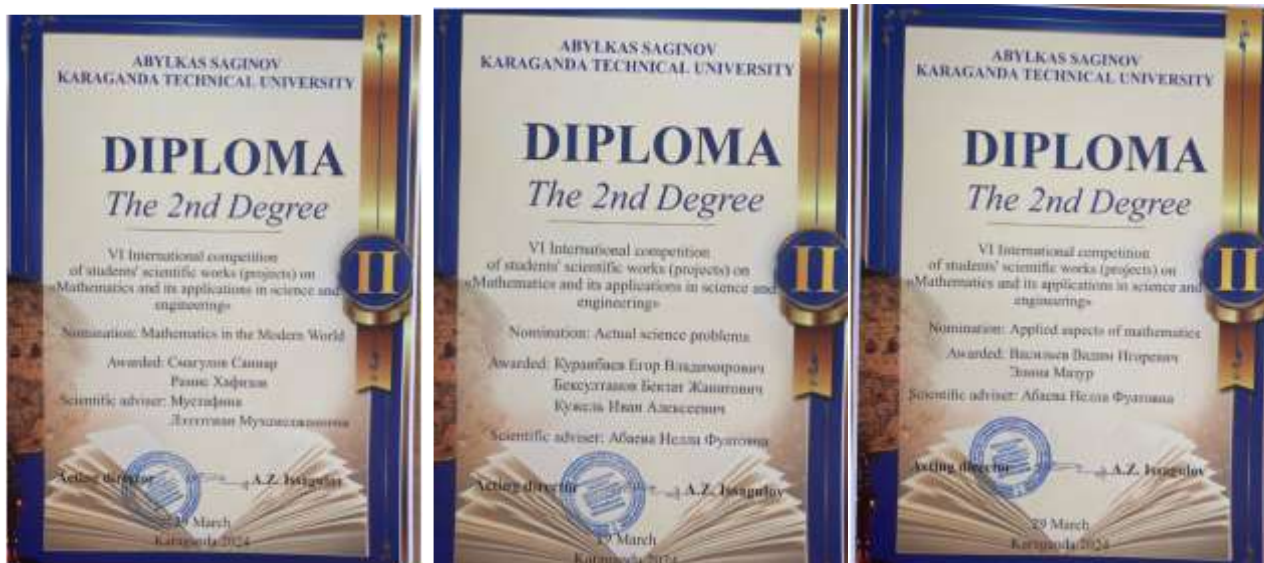
16 works (25 students) were submitted to the VI International Competition (29 March) under the guidance of Shaihova G.S., Kazhikenova S.S., Mustafina L.M., Zhurov V.V., Abaeva N.F., Kasymova L.J., Mergembaeva A.J., Tuleutaeva J.M., Akhmetova K.M., Kabieva G.K.

1) A. Karkeshova (Abylkas Saginov Kartu), second degree diploma in the nomination ‘Topical issues of science’, supervisor: Bekmagambetova E.K.

- 2) Epifantseva Alina, Orazova Kamila (Abylkas Saginov Kartu), Gnauzer Milana (Higher School of Economics, Moscow), second degree diploma in the nomination 'Topical issues of science', supervisor: Mustafina L.M.
- 3) Kuranbaev Egor Vladimirovich, Beksultanov Bekzat Zhanatovich, Kuzhel Ivan Alekseevich (Abylkas Saginov Kartu), third degree diploma in the nomination 'Current issues of science', supervisor: Abaeva N.F.
- 4) Arna Yakhiyakyzy Seytqalieva (Abylkas Saginov Kartu), the diploma of the first degree in the nomination 'Applied aspects of mathematics', supervisor: G.K. Kabieva.
- 5) Vasiliev Vadim Igorevich (Abylkas Saginov Kartu), Elina Mazur 'Integrierte Gesamtschule Horhausen' (Germany, Dierdorf), the second degree diploma in the nomination 'Applied aspects of mathematics', supervisor: Abaeva N.F.
- 6) Kapasova Aigul Kurmangazykyzyzy, Begim Aaym Farifollakyzyzy (Abylkas Saginov Kartu), the third degree diploma in the nomination 'Applied Aspects of Mathematics', supervisor: Mergembaeva A.Zh.
- 7) Karavanov Maxim Antonovich, Razumovich Margarita Andreevna (Abylkas Saginov Kartu), first degree diploma in the nomination 'Research work of applied nature', supervisor: Abaeva N.F.
- 8) Ashenbrener Philip, Duchak Vladislav (Abylkas Saginov KarTU), Kocherzhuk D.A. (E.A. Buketov KarTU), Mikhailichenko N.O. (E.A. Buketov KarTU), third degree diploma in the nomination 'Applied research work', supervisor: Akhmetov K.M.
- 9) Ainura Shaltakova (Abylkas Saginov KarTU), second degree diploma in the nomination 'Mathematics in Programming', supervisor: S.S. Kazhikenova.
- 10) Asenbaev Samat Sakenuly (Abylkas Saginov Kartu), diploma of the first degree in the nomination 'Applications of mathematical modelling', supervisor: Shaihova G.S.
- 11) Daniil Vladimirovich Sokolov, Ilya Sergeyeovich Reshetnikov (Abylkas Saginov Kartu), third degree diploma in the nomination 'Applications of mathematical modelling', supervisor: V.V. Zhurov.
- 12) Aidarbekov Aron Erbolovich (Abylkas Saginov Kartu), first degree diploma in the nomination 'Mathematics in the modern world', supervisor: Abaeva N.F.
- 13) Smagulov Saniyar (Abylkas Saginov Kartu), Ramis Khafizov (KNITU, Kazan), second degree diploma in the nomination 'Mathematics in the modern world', supervisor: Mustafina L.M.
- 14) Tazhieva Asel, Ryaskov Alexander, Antoniuk Kirill (Kartu named after Abylkas Saginov), Azilzhanov Arystan (KazNU named after Al-Farabi, Almaty), third degree diploma in the nomination 'Mathematics in the modern world', supervisor: Mustafina L.M.

15) Ermek Abyz Almasuly (Abylkas Saginov Kartu), third degree diploma in the nomination ‘Mathematics in the modern world’, supervisor: Kasymova L.Zh.

16) Erbulan Ardak (Abylkas Saginov Kartu), second degree diploma in the nomination ‘Professionally oriented mathematics’, supervisor: Tuleutayeva Zh.M.



1.3 Obtaining certificates of state registration of rights to copyright objects

№	Name of author(s)	Title of copyright object	Owner(s) of copyright	Certificate number, date
1	Abaeva N.F.	Elements of mathematical modelling	Abaeva N.F.	№ 44067, 29.03.2024
2	Zhurov V.V., Mustafina L.M.	Numerical series. Part 2	Zhurov V.V., Mustafina L.M.	№ 45916, 17.05.2024
3	Mustafina L.M., Zhurov V.V., Yarullina A.R.	Elements of Probability Theory. Basic concepts of the theory	Mustafina L.M., Zhurov V.V., Yarullina A.R.	№ 46280, 23.05.2024
4	Shaihova G.S.	The concept of derivative. Definition of a derivative. Table of derivatives. Geometric, physical meanings of the work	Shaihova G.S.	№ 46712, 30.05.2024
5	Bekmagambetova E.K., Kasymova L. Zh.	Differentiation and integration of functions of complex variable	Bekmagambetova E.K., Kasymova L. Zh.	№ 46243, 22.05.2024

6	Kazhikenova S.S., Shaltakov S.N., Shaltakova A.N.	Application of the theory of series for solving applied problems	Kazhikenova S.S., Shaltakov S.N., Shaltakova A.N.	№ 46707, 30.05.2024
7	Akhmetov K. M.	Multivariate functions. Two variable functions	Akhmetov K. M.	№ 46344, 23.05.2024
8	Mergembayeva.Zh., Amanzholov S.M.	Anktalğan integral	Mergembayeva.Zh., Amanzholov S.M.	№ 46833, 03.06.2024
9	Tuleutaeva Zh. M.	Derivative, definition of the derivative, calculation rules. Geometric, physical meanings of the work	Tuleutaeva Zh. M.	№ 47069, 06.06.2024



1.4 Издания в журналах

1.4 Publications in journals indexed in Scopus database and recommended by Science and Higher Education Quality Assurance Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan

Scopus:

1.4.1. Abayeva, N., Zhurov, V., Mustafina, L. (2024). Innovative massive open online course for young researchers: impact of implementation in Kazakhstani universities. *Cogent Education*, 11(1).

1.4.2. Malyshev, V.P., Kazhikenova, S.Sh., Makasheva, A.M., Kazhikenova, A.Sh., Isomorphism Theorems of a Series Sum and the Improper Integral. Bulletin of the Karaganda University. Mathematics Series, 2024, 113(1), pp. 128–139

1.4.3. Kosmakova, M.T., Khamzeyeva, A.N., Kasymova, L.Z. Boundary value problem for the time-fractional wave equation. Bulletin of the Karaganda University. Mathematics Series, 2024, 114(2), pp. 124–134

1.4.4. Nella Abayeva, Lezzetzhana Mustafina, Vitaliy Zhurov, Irina Yerakhtina, Bakhytzhana Mustafina. Leveraging Mathematics to Enhance Critical Thinking in Technical Universities. Asian Journal of University Education (AJUE) Volume 20, Number 3, October 2024, pg 566-581

Science and Higher Education Quality Assurance Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan:

1.4.5. Kazhikenova, S.S., Shaikhova, G.S., Shaltakov, S.N., Belomestny, D. Demonstration of the feasibility and practical value of direct acoustic measurements in liquid metals. KOMPLEKSNOE ISPOLZOVANIE MINERALNOGO SYRA, №2(329), 2024

1.4.6. Abayeva Nella, Zhurov Vitaliy Development of the online course "Statistical Analysis and Information Processing for Scientific Research Works", Trudy Universiteta, №2 (95), 2024, P. 333-338

1.4.7. Akhmetov K.M., Amanzholov Zh.K., Gabaidullin R.I., Jolmagambetov N.R., Arkabaev U.B. Modelirovanie ocenki riska pozhara na rezervuare hraneniya nefteproduktov. Trudy Universiteta, №1, 2024

1.5 Hirsch Index of faculty members of the VM Department (SCOPUS)

[Doctor of Technical Sciences, Professor Saule Sharapatova Kazhikenova](#)

[Candidate of Pedagogical Sciences, Acting Associate Professor Nella Fuatovna Abaeva](#)

[Candidate of Technical Sciences, Acting Associate Professor Gulnazira Serikovna Shaihova](#)

[Candidate of Physical and Mathematical Sciences, Associate Professor Mustafina Lezzetzhana Mukhamedzhanovna](#)

[Dr PhD, Acting Associate Professor Laila Zhumazhanovna Kasymova](#)

[Candidate of Technical Sciences, Acting Associate Professor Vitaly Vladimirovich Zhurov](#)

