Head of Department

Mamadaliev Khusniddin Abdujalilovich

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The Department of Algorithmization and Mathematical Modeling of the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi was founded by the Decree of the President of the Republic of Uzbekistan dated March 26, 2013 "On measures to further improve the education system in the field of information and communication technologies" and in accordance with the Resolution of the Cabinet of Ministers No. 188 dated June 28, 2013 "On improving the organizational structure of the Tashkent University of Information Technologies and its regional branches", on the basis of Order No. 905 dated August 29, 2013 of the Rector of the Tashkent University of Information Technologies. In 2013-2021 the Department was headed by Ph.D., Assoc. Abdurakhmanova Yulduz Mukhtarkhodzhaevna. At present, the department is headed by Ph.D. Mamadaliev Khusniddin Abdijalilovich.

Pride of the Department: Faraday Basyrovich Abutaliev, Uzbek mathematician, Academician of the Academy of Sciences of the Republic of Uzbekistan, Honored Scientist of the Republic. (03/25/1932-08/27/2012).

The "Algorithmization and mathematical modeling" Department, separated from the "Higher Mathematics" Department, according to the Order of the Rector of the Tashkent University of Information Technologies dated August 29, 2013 No. 905, was founded for in-depth training of students using computer technology and the mathematical foundations of informatics, as well as mathematical sciences at practice. Initially, the idea of creating the "Algorithms and Mathematical Modeling" Department belonged to Professor Faraday Basirovich Abutaliev, Academician of the Academy of Sciences of the Republic of Uzbekistan, Doctor of Physical and Mathematical Sciences, who worked as the head of the "Higher Mathematics" Department from 2003 to 2012.

Subjects are taught at the department:

For undergraduate students:

- Discrete Structures
- Algorithm design

The educational tendencies of bachelor's degree of the department:

- 60540300 - Mathematical engineering (according to production areas)

Department professors:

- Mamadaliev Khusniddin Abdizhalilovich – head of department, PhD, associate professor
- Mirzaev Anvar Nazirovich – Ph.D., Associate Professor
- Turgunov Abrorzhon Makhamatsolievich – PhD, Associate professor
- Narmanov Otabek Abdigapparovich – PhD, acting. Assistant professor
- Nasriddinov Salakhiddin Samariddinovich – senior lecturer
- Koldoshev Hakim Murodilloevich – senior lecturer.

- Begimov Oybek Mamarasulovich – senior lecturer
- Matyakubov Marx Yakhasmuradovich – senior lecturer
- Lemara Rafatovna Ismailova – assistant
- Murodillaeva Zulfiniso Hakim kizi – assistant
- Nosirova Namunabonu Azamat kizi – assistant
- Rakhmonova Nilyufar Normurodovna – assistant
- Masharipov Sirojiddin Ismailzhan coals – assistant
- Kamalova Sevara Jabborberganovna – trainee teacher.

Part-time teachers

- Kabulov Anvar Vasilovich – professor, doctor of technical sciences. (external part-time worker)
- Khodzhaev Ismatulla Kushaevich – professor, doctor of technical sciences. (external part-time worker)
- Khamdamov Muzaffar Mukhiddinovich – associate professor, PhD (external part-time worker)
- Tashtemirova Nodira Nematillaevna – associate professor, PhD (external part-time worker)
- Begimov Oktam Ibragimovich – associate professor, PhD (external part-time worker)
- Ravshanov Shokhzhakhon Akmal Ugli – assistant, (external part-time worker)
- Ravshanov Anvar Asatilloevich – assistant, (external part-time worker)
- Khusenov Bekhzod Erkin Ugli – assistant, (external part-time worker)

ACTIVITIES OF THE DEPARTMENT:

In order to increase students' interest in the subjects taught at the department, scientific circles were organized. Members of circles and talented students of the department participate in scientific conferences with their scientific articles. Professors and teachers of the department conduct their pedagogical and scientific activities together with educational work with young people.

As a result of the scientific activity of professors and teachers of the department, the scientific project "Creation and modeling of a topological model of gas networks" became the winner of the "Young Scientists" competition and was funded in the amount of 487,062,000 soums. Young specialists of our university, together with young scientists of the partner organization Institute of Seismic Resistance of Mechanics and Structures, developed a work plan and are implementing it at a high pace. The potential of the department is increasing every year due to the successful defense of their scientific works by professors and teachers.

List of state and foreign grants (fundamental, practical and innovative projects) implemented at the department:

- IL-1150/22 - Creation and modeling of a topological model of gas networks (Project leader: head of the department Mamadaliyev Kh.A.)

Educational and methodical works published at the department:

- Textbook on the subject "Discrete Mathematics" 2021, "Alokachi";
- Textbook on the subject "Design of algorithms" 2022, TUIT "Alokachi";
- Mathematical models of the activity of the mechanisms of regulation of liver cells and hepatitis B viruses // Monograph, 2022, TATU "Alokachi";
- Guidelines for the implementation of practical and laboratory tasks in the subject "Design of

algorithms" 2022, TUIT "Alokachi";
- Guidelines for organizing independent work in the discipline "Design of algorithms" in 2022, TATU "Alokachi";
- Guidelines for organizing independent work in the discipline "Design Algorithm" 2022, TATU "Alokachi";
- Guidelines for organizing independent work on the topic "Discrete structures" in 2022, TATU "Alokachi";
- System methodology for mathematical modeling of the process of mass transfer in the atmosphere / Monograph - Tashkent: Navruz, 2021. - 280 pages.

List of articles published by professors and scientific applicants of the department:

- Research of the elementary section of a gas pipeline under gas outflow from its end to the environment // 2021 International Conference on Information Science and Communications Technologies (ICISCT) | 978-1-6654-3258-0/21/$31.00 ©2021 IEEE | DOI: 10.1109/ICISCT52966.2021.9670225;
- Statistical analysis and forecast of the dynamics of cotton yield in the Namangan region of the republic of Uzbekistan, NVEO Natural Volaties/Essential Oils // Nat. Volatiles & Essent. Oils, 2021; 8(5): 12109-12115;
- Numerical calculation method of pipeline transport of low-compressible fluid //Advances in Mathematics: Scientific Journal 10 (2021), no.5, 2393–2408 ISSN: 1857-8365 (printed); 1857-8438 (electronic) https://doi.org/10.37418/amsj.10.5.8;
- Numerical method for solving the problem of the gas-dynamic state of a main gas pipeline section relief of a variable cross-sectional area // IOP Conference Series: Materials Science and Engineering, Pp.1-13;
- Statistical Analysis and Forecasting of Cotton Yield Dynamics in Namangan Region, Republic of Uzbekistan // Problems of Computational and Applied Mathematics Special Issue №6/1(37) 2021;
- Transparent relativistic quantum networks // 2021 International Conference on Information Science and Communications Technologies (ICISCT) | 978-1-6654-3258-0/21/$31.00 ©2021 IEEE | DOI: 10.1109 / ICISCT 52966.2021.9670289, - Tashkent, 2021. SCOPUS;
- Analogues of the cauchy-goursat problem for a loaded third-order hyperbolic type equation in an infinite three-dimensional domain// Сибирские Электронные математические известия, Том 18, №1 стр.72-85 (2021);
- Boundary value problem for loaded equation of parabolic-hyperbolic type of the third order in an infinite three-dimensional domain// International Journal of Applied Mathematics, Volume 34 No. 2 2021;
- Nonlocal nonlinear Schrödinger equation on metric graphs: A model for generation and transport of parity-time-symmetric nonlocal solitons in networks // Physical Review Ethis link is disabled, 2022, 105(5), 054205;
- Networks with point-like nonlinearities // Nanosystems: Physics, Chemistry, Mathematicsthis link is disabled, 2022, 13(1), стр. 30–35;
- Transparent boundary conditions for the sine-Gordon equation: Modeling the reflectionless propagation of kink solitons on a line
- Physics Letters, Section A: General, Atomic and Solid State Physicsthis link is disabled, 2022, 423, 127822;
- Dirac particles on periodic quantum graphs // Physical Review Ethis link is disabled, 2021, 104(1), 014219;
- Reflectionless propagation of Manakov solitons on a line: A model based on the concept of

transparent boundary conditions // Physical Review Ethis link is disabled, 2021, 103(4), 043305;

- Analysis of different clinical forms of viral hepatitis B disease // International Conference on Information Science and Communications Technologies: Applications, Trends and Opportunities, ICISCT 2021, 2021;
- Research Solution of the Problem of Forming a Flat Structure of Finite Width from a High-Temperature Melt/// Annals of R.S.C.B., ISSN:1583-6258, Vol.25, Issue 6, 2021, Pages. 312-317;
- Some Invariant Solutions of Two Dimensional Heat Equation/// Montes Taurus Journal of Pure and Applied Mathematics. 3(3), 334-343, 2021;
- The role of physics in the study of nature and its role in development with other sciences/// International Journal of Engineering in Computer Science, 2021; 3(2): p.05-08;
- The role of mental arithmetic in the mental development of the pupil// International Journal of Academic Pedagogical Research(IJAPR), Vol.6 Issue 6, June-2022, Pages:149-153;
- Modeling theory of acquisition mode materials of high-strength flexible structures(SCOPUS)///International Journal of Mechanical Engineering// ISSN: 0974-5823////Vol. 6 No. 1 January-June, 2021;
- Calculation of the coefficients of optimal quadrature formulas in space $W^{2,1}_{2,sigma}$ Cite as: AIP Conference Proceedings 2365, 020034 (2021); https://doi.org/10.1063/5.0057196, Published Online: 16 July 2021;
- A computer model of processes of diffusion into the atmosphere due to salinization in the Arol region // PROBLEMS OF COMPUTATIONAL AND APPLIED MATHEMATICS T.- Special issue № 2/1(40) 2022, стр. 280-286;
- Software and instrumental complex for decision-making on environmental protection from technogenic factors // AIP Conference Proceedingsthis link is disabled, 2022, 2467, 060003
- Numerical Algorithm for Calculation the Density of Harmful Substances in the Atmosphere // International Conference on Information Science and Communications Technologies: Applications, Trends and Opportunities, ICISCT 2021.

Certificates received for created programs:

- The program for the numerical study of self-similar solutions of the quasilinear heat equation" // Intellectual Property Agency under the Ministry of Justice of the Republic of Uzbekistan. Certificate of official registration of the program created for electronic computers. No. DGU12730. Tashkent, 10/18/2021;
- Modeling of cavitation and pulsation processes in tanks//Intellectual Property Agency under the Ministry of Justice of the Republic of Uzbekistan No. DGU13684, 11/19/2021. DGU 20213718;
- The program for the numerical study of self-similar solutions of nonlinear equations /// Agency for Intellectual Property under the Ministry of Justice of the Republic of Uzbekistan No. DGU13659, 12/16/2021. DGU 20213605;
- The method of least squares in solving the approximation problem. Program for linear and quadratic models /// Intellectual Property Agency under the Ministry of Justice of the Republic of Uzbekistan No. DGU18355, 08/16/2022. DGU 20213605;
- "Electronic program for calculating certain integrals" // Intellectual Property Agency under the Ministry of Justice of the Republic of Uzbekistan No. DGU 12621 08/31/2021;
- "An application for solving mathematical and physical equations (Hyperbolic type equations)" // Intellectual Property Agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 16894. Tashkent, 14.05.2022;
- "Aerosol_diffusion" // INTELLECTUAL PROPERTY AGENCY UNDER THE MINISTRY OF JUSTICE OF THE REPUBLIC OF UZBEKISTAN. Certificate of official registration of the program created for electronic computers. No. DGU 2022 0488. Tashkent, 02/07/2022.

- "GIS aerosol harmful monitoring" // INTELLECTUAL PROPERTY AGENCY UNDER THE MINISTRY OF JUSTICE OF THE REPUBLIC OF UZBEKISTAN. Certificate of official registration of the program created for electronic computers. No. DGU 20223038. Tashkent, 05/25/2022
- "GIS visualization" // INTELLECTUAL PROPERTY AGENCY UNDER THE MINISTRY OF JUSTICE OF THE REPUBLIC OF UZBEKISTAN. Certificate of official registration of the program created for electronic computers. No. DGU 20222933. Tashkent, 05/21/2022
- "GIS aerosol harmful monitoring" // INTELLECTUAL PROPERTY AGENCY UNDER THE MINISTRY OF JUSTICE OF THE REPUBLIC OF UZBEKISTAN. Certificate of official registration of the program created for electronic computers. No. DGU 20223038. Tashkent, 05/25/2022
- "GIS visualization" // INTELLECTUAL PROPERTY AGENCY UNDER THE MINISTRY OF JUSTICE OF THE REPUBLIC OF UZBEKISTAN. Certificate of official registration of the program created for electronic computers. No. DGU 20222933. Tashkent, 05.21.2022

SCIENTIFIC SEMINARS HELD AT THE DEPARTMENT:

№	Full name of the lecturer conducting the seminar	Topic of the seminar
1.	Narmanov Otabek Abdigapparovich	Application of Lie groups in problems of mathematical modeling described using special partial differential equations
2.	Mirzaev Anvar Nazirovich	Mathematical foundations of digital processing and analysis of information
3.	Mamadaliev Khusniddin Abdujalilovich	Mathematical modeling of changes in pressure and mass flow of gas in the linear section of the main gas pipeline
4.	Nasriddinov Salokhiddin Samariddinovich	Mathematical model and software for economic problems
5.	Turgunov Abrorzhon Makhamatsolievich	Qualitative analysis of the mathematical model of quasi-stationary activity of hepatitis B viruses.
6.	Kuldoshev Khakim Murodilloevich	Calculation of the coefficients of optimal quadrature formulas in space $W^{(2,1)}_{2,a}$
7.	Begimov Oybek Mamarasulovich	Asymptotic Comparative Analysis of Data Structure and Complexity of Search and Sorting Algorithms

Cooperation in the development of the department:

- National University of Uzbekistan named after Mirzo Ulugbek;
- Research Institute for the Development of Digital Technologies and Artificial Intelligence;
- Institute of Seismic Resistance of Mechanics and Structures named after M.T. Orozboev, FA RUz;
- Institute of Mathematics V.I. Romanovsky at the Academy of Sciences of the Republic of Uzbekistan.

The department is located on the 3rd floor of the main building B in rooms 318, 321 - 325, 327.