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.

In the 2021-2022 academic year, under the leadership of the head of the department Kh. A. Mamadaliev, the direction "Mathematical Engineering" was opened

Bachelor's degree:

• 60540300 - Mathematical Engineering (in industrial areas)

Subjects are taught at the department:

Bachelor's degree:

- Fundamentals of Mathematical Engineering
- Applied Mathematics 1, 2
- Linear Algebra and Analytic Geometry
- Discrete Mathematics and Mathematical Logic
- Mathematical Analysis
- Applied Calculus Packages 1, 2
- Numerical Methods 1, 2
- Fundamentals of Systematic Modeling and Design
- Algorithmic Languages and Programming
- Algorithm Design
- Mathematical Programming

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
- Aliqulov Yolqin Qodirovich PhD, acting. Assistant professor
- Narmanov Otabek Abdigapparovich PhD, acting. Assistant professor
- Nasriddinov Salakhiddin Samariddinovich 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

- Begimov Oybek Mamarasulovich senior lecturer
- Matyakubov Marx Yakhasmuradovich senior lecturer

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:

- Tutorial on the subject "Algorithm Design" 2022, TUIT "Aloqachi";
- Guidelines for the implementation of practical and laboratory work on the subject "Algorithm Design" 2022, TUIT "Aloqachi";
- Manual for the regulation of the mechanistic control of the hepatitis B virus in mathematical models // Monograph, 2022, TUIT "Aloqachi";
- "Algorithm Design II" textbook on science 2023, TUIT "Aloqachi";
- "Algorithm Models" textbook on science 2023, TUIT "Aloqachi";
- "Algorithm Design" textbook on science 2024, TUIT "Aloqachi";
- "Differential equations" textbook on science 2024, TUIT "Aloqachi";

- "Design of algorithms and programs" educational manual, 2024, TUIT "Aloqachi";
- Practical examples and problems from the discipline "Discrete Structures" study guide, 2024, TUIT "Aloqachi";
- Methodical guide for practical exercises on solving problems from the subject "Algorithm design", 2024, TUIT "Aloqachi";
- Guidelines for solving problems on elements of set theory and combinatorics" (in the subject Discrete Structures), 2024, TUIT "Aloqachi";
- "Methodical instructions for practical exercises on solving problems from the subject "Discrete structures" (sets and relations), 2024, TUIT "Aloqachi";
- Methodical instruction on solving problems from combinatorics, 2024, TUIT "Aloqachi";
- Tasks and methodical instructions for completing them for part-time, second higher education parttime courses in the science of discrete structures, 2024, TUIT "Aloqachi";
- Guidelines for completing tasks in the subject "Discrete Structures" for correspondence students and for students in the direction of second higher education, 2024, TUIT "Aloqachi".

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

- Study of Transition Process Features in Short Gas Pipelines by the Method of Characteristics // The Third International Scientific Conference Construction Mechanics, Hydraulics and Water Resources Engineering, AIP Conf. Proc. 2612, 030027-1-030027-9;
- Numerical Modeling of Vertical Axis Wind Turbines Using ANSYS Fluent Software // Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics., 2023, 13772 LNCS, - pp. 156–170;
- Post-pass regime at stationary functioning of main gas pipelines // AIP Conf. Proc. 3004, 060010 (2024);
- Modeling of Combustion Processes in Cylindrical Chambers Using Modern Package Programs // AIP Conference Proceedings 2024, 3004(1), 060015;
- Power Losses Of Asynchronous Generators Based On Renewable Energy Sources // E3S Web of Conf. 2023, 434, 01020;
- Numerical simulation of combustion processes // E3S Web of Conferences 401, 03072 (2023), CONMECHYDRO – 2023;
- Fuzzy Morphological Processing Algorithm of Blood Image // 2024 IEEE EDM, 2024 IEEE 25th International Conference of Young Professionals in Electron Devices and Materials;
- A class of Lotka-Volterra operators and its application (action in the S 3 simplex) // International Journal of Mathematics and Computer Science, 19(2024), no. 4, 1311–1314;
- Operative-predictive control of a reactor plant based on fuzzy models // AICCONF 2024, "Cognitive Models and Artificial Intelligence Conference", 2024;
- Разработка системы раннего выявления рака легких на основе анализа медицинских изображений с использованием искусственного интеллекта // Educational Research in Universal Sciences ISSN: 2181-3515, Volume 2 | Special issue 5 | 2023. с. 229-238;
- Adventages of solving system of linear algebraic equations in simple iteration and Zeydel methods // International journal of scientific researchers (I.F.:7.293), Volume 5 issue 1 p.601-604;
- On teaching students to extract roots from complex numbers using C++ software // Multidisciplinary and multidimensional journal (I.F.: 9.1) Volume 3 issue 4(2024) p. 89-95;
- On the symmetry group of differential equations // "Golden Brain" scientific journal volume 1, issue 28, october, vol. 1 no. 28(2023) Golden Brain, 1(28), 142–150;
- Use of Innovative Technologies to Learn Programming // Journal of Science, Research and Teaching Vol. 3, No. 6, 2024 ISSN:2181-4406;
- An optimal quadrature formula with sigma parameter // "Problems of computa-tional and applied mathematics" No.2/1(48) 2023. 7-19 p;

- Mathematical Modeling Of Processes In A Cylindrical Combustion Chamber In Ansys Fluent Software Package // Journal of Hydraulic and Environmental Engineering, Volume 1, Issue 2, 2023, ISSN: 2181-3949;
- An optimal quadrature formula with sigma parameter. "Problems of computational and applied mathematics" No.2/1(48) 2023. 7-19 p;
- "An optimal quadrature formula with sigma parameter" // of the 8th International conference "actual problems of applied mathematics and information technologies" Al-Khwarizmi 2023, September 25-26, 2023;
- 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;
- 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), cтp. 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;
- 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;
- Software and instrumental complex for decision-making on environmental protection from technogenic factors // AIP Conference Proceedingsthis link is disabled, 2022, 2467, 060003.

Certificates received for created programs:

- Program for the basic rules of combinatorics // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 30594;
- "Software of visual distribution" // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 32245;
- 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;
- "Application for solving mathematical and physical equations (Equations of Hyperbolic type)" // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 16894;
- Modeling of solar radiation at different geographic latitudes using Pascal software // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 26699;
- Modeling the topological model of gas networks using Simulink // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 26731;
- Numerical method for calculating a pipeline with a pressure disturbance damper // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 26732;
- "Program for basic rules of combinatorics" // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 30594;
- "Software of visual distribution" // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, DGU 32245;
- Program for 3D visualization of gas pressure in porous media // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 32879;
- Basic rules of combinatorics. The issue of grouping // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 32900;

- E-classification and zoning (Hybrid program complex) (Official expertise) // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 184875;
- Truth table for simple and complex considerations // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 34209;
- Modeling of electricity generation of wind turbines in Matlab/Simulink in the form of a block diagram // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 33841;
- Determining the effective parameters of vertical axis wind turbines based on aerodynamic research // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 38568;
- Identifying Euler and Hamilton cycles in graphs // Intellectual property agency under the Ministry of Justice of the Republic of Uzbekistan, No. DGU 34781.

SCIENTIFIC SEMINARS HELD AT 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.

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