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## ҮЗІНДІ

**ТЫҢДАЛДЫ:** Академиялық мәселелер жөніндегі Басқарма мүшесі – проректор А.Ғ. Қазмағамбетовтың «"Әл-Фараби атындағы Қазақ ұлттық университеті" КеАҚ жасанды интеллект технологияларын қолдану жөніндегі ережені» бекіту туралы ақпары.

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Бас ғалым хатшы           Л.М. ШАЙКЕНОВА

# REGULATIONS ON THE USE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE «AL-FARABI KAZAKH NATIONAL UNIVERSITY»

**Almaty, 2024**

# CONTENT

# 1. GENERAL

**1.1** The Regulation on the use of artificial intelligence technologies at Al-Farabi Kazakh National University (hereinafter referred to as the Regulation) defines the basic concepts, organization procedure, observance of ethical norms and principles, conditions for the implementation of artificial intelligence technologies in educational programs at all levels of education (higher and postgraduate education).

**1.2** This regulation has been developed jointly by the Office of Academic and Digital Innovations and the Department of Training and Certification of Scientific Personnel.

**1.3** The Regulation is intended for students, faculty, managers and employees of structural divisions of the NAO Al-Farabi Kazakh National University (hereinafter referred to as the University), as well as other interested persons.

**1.4** The regulation has been developed in accordance with:
- The Law of the Republic of Kazakhstan "On Education" dated July 27, 2007 No. 319-III;
- Resolution of the Government of the Republic of Kazakhstan dated March 28, 2023 No. 248 "On approval of the Concept of Development of Higher Education and Science in the Republic of Kazakhstan for 2023-2029";
- The Interuniversity standard for the use of AI in higher and postgraduate education (REMS Ministry of Science and Higher Education of the Kazakhstan December 20, 2023);
- "Guidelines on the use of generative artificial intelligence in education and research" of the United Nations Educational, Scientific and Cultural Organization (UNESCO);
- A guide for policy makers. AI technologies in education". United Nations Educational, Scientific and Cultural Organization (UNESCO);
- Academic policy of the University.

**1.5** The Regulation may be revised in the event of changes in regulatory legal acts regulating educational activities in the Republic of Kazakhstan, changes in the Charter and the University Development Program, as well as on the basis of a decision of the Academic Council of the University.

# 2. BASIC CONCEPTS

**2.1 Automatic speech recognition (ASR)** is the ability of a system to accept input information in the form of human speech.

**2.2 Adaptive learning** is a type of learning in which an individual learning trajectory is formed for the student, based on a continuous analysis of his personal academically significant characteristics (level of training, individual characteristics, peculiarities of using various formats of educational and methodological materials, level of knowledge, etc.).

**2.3 Generative artificial Intelligence (Gen AI)** is a type of artificial intelligence that is capable of creating new data similar in structure and characteristics to existing data. It uses various machine learning and deep learning algorithms to generate text, images, music and other types of content.

**2.4 AI agent** is an automatically acting object that perceives its environment, reacts to it, and also takes actions to achieve its goals.

**2.5 Artificial intelligence (AI)** is a set of software algorithms that allows you to simulate a number of functional capabilities of the human brain in a dynamic computing environment, including creating text, graphics, audio, multimedia materials and documents identical or partially identical to those created by teachers and students.

**2.6 Machine learning (ML)** is the process of optimizing model parameters using computational methods so that the behavior of the model reflects data and/or experience.

**2.7 Natural language understanding (NLU, natural language comprehension)** is the extraction of information by a functional component from a text or speech transmitted to it in natural language, and the creation of a description of both this text or speech and what they represent.

**2.8 Speech recognition (speech-to-text, STT)** is the conversion of a functional component of a speech signal into a representation of the content of speech.

**2.9 Artificial intelligence system (AI system)** is a technical system that generates end results such as content, forecasts, recommendations or solutions for a given set of human-defined goals.

**2.10 Deep learning (deep neural network learning)** is an approach to creating extensive hierarchical representations by training neural networks with a large number of hidden layers.

**2.11 Neural network (NN)** is a network of two or more layers consisting of neurons connected by weighted connections with adjustable weights, while each neuron receives input data and produces a result.

**2.12 Machine translation (MT)** is the task of automatically translating text or speech from one natural language to another using a computer system.

**2.13 Natural language** is a language that is actively used or has previously been actively used by a community of people, the rules of which are determined by the practice of its application.

**2.14 Natural language processing (NLP)** — information processing based on natural language understanding and/or natural language generation.

**2.15 Digital footprint (in education)** — data on the student and his/her activities, including video and audio recordings, data on the chronology of interaction with various means of education and upbringing, on the chronology of interaction with other participants in educational relations and information about

such interaction, including acquired qualifications, subsequent employment and professional activities, reviews and evaluations, as well as learning outcomes using educational and methodological data presented in electronic digital format.

## 3. PRINCIPLES AND SYSTEM OF ARTIFICIAL INTELLIGENCE

**3.1** AI provides opportunities for fast and efficient processing of large amounts of data, which significantly accelerates scientific research and allows for new insights and discoveries. Modeling and forecasting using AI create conditions for advanced research in various scientific fields, which contributes to obtaining innovative results.

**3.2** The introduction of AI technologies into the educational and scientific process of the University is aimed at improving the quality of education and research, as well as optimizing administrative processes. The use of AI agents significantly enriches and improves the educational process by providing additional resources, individualized support and additional opportunities for learning, research and communication.

**3.3** AI-oriented education contributes to the formation of students' skills and competencies necessary for a successful career in the digital economy. The introduction of AI stimulates the development of entrepreneurial thinking and innovation among students and teachers, supporting the creation of startups and innovative projects.

**3.4** The principles of functioning of artificial intelligence include:

3.1.1 Algorithmic data processing - AI uses various algorithms to analyze and process data, on the basis of which it makes decisions and (or) performs tasks.

3.1.2 Machine Learning - AI systems learn from data, improving their abilities by analyzing past data and experiences.

3.1.3 Neural networks are the principle of modeling and simulating the work of the human brain, which allows AI to solve complex tasks such as pattern recognition or natural language processing.

3.1.4 Automation of tasks and Autonomous decision-making - And is able to perform tasks with minimal human participation, as well as independently make decisions within the specified parameters and goals.

3.1.5 Adaptability - AI systems can adapt and change their behavior depending on new data or changes in the environment.

3.1.6 Natural language processing: AI is able to understand and generate materials in the form of symbolic representations of human thinking (text, images, videos, music, program code), which allows it to interact with users on a more intuitive level.

3.1.7 Big Data - AI uses and analyzes large amounts of data to identify patterns and create forecasts.

3.1.8 Optimization and Prediction - AI is used to optimize processes and predict results based on data analysis.

## 4. SUBJECT AREAS OF AI APPLICATION AND THEIR TYPES

**4.1** Subject areas of AI application include:

4.1.1 Information technology and computer science

− machine learning and data analysis: development and application of machine learning algorithms for big data analysis, predictive analytics and intelligent systems development;

− natural language processing: using AI to automatically translate texts, analyze moods, create chatbots and voice assistants;

− computer vision: the application of AI technologies for pattern recognition, image and video processing, including in security systems.

4.1.2 Natural sciences

− biology and medicine: using AI to analyze genomic data, develop new drugs, predict protein structure, and perform medical diagnostics;

− ecology and climatology: the use of AI for modeling climate change, analyzing environmental data and developing sustainable development strategies.

4.1.3 Humanities

− linguistics: using AI to automatically analyze texts, create linguistic models, and develop language learning tools;

− history and cultural studies: the use of AI to analyze historical data, create virtual reconstructions and study cultural phenomena.

4.1.4 Social Sciences

− sociology and psychology: using AI to analyze social networks, predict human behavior, research public opinion and develop psychometric tests;

− economics: the use of AI to analyze economic data, predict market trends, and develop economic models.

4.1.5 Technical sciences

− engineering: the use of AI for computer-aided design, optimization of production processes, development of intelligent control systems and analysis of engineering data;

− Robotics: the application of AI to the development of autonomous robots, automatic control systems and solutions for industrial automation.

**4.2** The subject areas of AI application at the University can be supplemented and expanded depending on the requirements of the educational, organizational and administrative processes of the University.

**4.3** The types of AI technologies used at the University include:

4.3.1 Machine learning:

– supervision: application for data classification, regression analysis and predictive analytics. For example, analyzing student performance and predicting their results;

– unsupervision**:** use for clustering, data dimensionality reduction, and anomaly detection. For example, the analysis of large amounts of scientific data.

4.3.2 Natural Language Processing (NLP):

– chatbots and virtual assistants: Automating answers to frequently asked questions from students and staff, providing advice and support;

– text analysis: Extracting information from texts, analyzing social media sentiment, and automatically creating document summaries.

4.3.3 Computer vision:

– pattern recognition: used for campus security, face identification, and surveillance video analysis;

– medical image processing: automatic diagnosis of diseases based on the analysis of X-rays, MRI and other medical images.

4.3.4 Generative models:

– generative-adversarial networks (GANs): creation of new images, audio and video content, generation of texts and musical compositions;

– autoencoders: data analysis and compression, image restoration and signal quality improvement.

4.3.5 Multi-agent systems:

– autonomous agents: Development of systems in which autonomous agents can interact and coordinate their actions to achieve common goals;

– distributed computing: application for resource optimization, distributed learning of AI models and management of distributed systems.

**4.4** The types of AI technologies and systems used at the University can be supplemented and expanded depending on the requirements of the educational, organizational and administrative processes of the University.

## 5. THE PROCEDURE FOR USING AI IN THE EDUCATIONAL PROCESS

**5.1** Students can use AI to improve learning outcomes and effectively manage their time, use AI agents to search and organize information, and create automated notes and summaries of learning materials. AI can also help with exam preparation by offering practice tests and analyzing their results to identify weaknesses. Generative AI helps students quickly create digital materials when preparing answers to teacher assignments. In addition, virtual labs and AI-based simulators allow students to conduct experiments and research remotely and online.

**5.2** Lecturers can use AI to improve the effectiveness and quality of teaching. AI can automate the process of creating and updating educational materials by generating relevant content and test tasks based on the latest scientific data.

Teachers can create interactive learning applications and simulators based on AI, create chatbots and/or digital doubles to answer students' questions. Teachers can use AI analytical tools to monitor student performance, identify difficulties, and respond quickly to them. AI systems can provide teachers with recommendations for improving the educational process based on the analysis of feedback from students and their academic performance.

**5.3** Administrative and management personnel (hereinafter referred to as AMP) can use AI to automate and optimize administrative processes. AI systems can automate the processing of applications for admission, registration for courses, schedule management and attendance records. AI can analyze large amounts of data to predict trends in student admissions and academic performance, which helps in resource planning and strategic decision-making. AI systems can also improve interaction with applicants, students and graduates through intelligent chatbots and virtual assistants that provide round-the-clock support and advice.

**5.4** The organization of the educational process using AI is carried out by the faculties of the University.

**5.5** When developing and updating University educational programs, it is necessary to include AI modules covering both basic concepts and advanced topics such as machine learning, big data processing, neural networks and other related areas.

**5.6** When teaching disciplines using AI, it is necessary to take into account the specifics of the subject area and technology development.

**5.7** When using AI systems by teachers, students and University staff, it is recommended to register for access to AI systems via a separate e-mail that does not contain personal information.

**5.8** In the case of preparing educational, methodological, auxiliary or other material using generative AI for its application in the educational process, faculty teachers should explicitly inform students about the Gen AI used in the preparation of the material. To do this, teachers indicate the names and references used by GenAI in the list of references in the preparation of materials. In the absence of a list of references, an indication of the Gen AI used is provided in the description files, which must be uploaded to digital platforms along with the prepared materials.

**5.9** In the case of the use of AI in the educational process, it is necessary to ensure equal access to its use by all participants in the educational process without the need to possess or acquire additional resources for the full use of its functionality.

**5.10** When using AI, it is necessary to take into account the technical limitations of AI systems (such as the number of users, the number of simultaneous requests, regional restrictions, language and other requirements) in order to avoid situations in which one of the students will be deprived of access to the functionality used in the educational process.

**5.11** In the case of preparing answers to teachers' assignments for the current semester using Gen AI (in text, graphic, multimedia and other forms), students must explicitly inform the teacher about the Gen AI used in the preparation of the material. To do this, students indicate the names and references to the Gen AI used in the list of references in the preparation of materials. In the absence of a list of references, an indication of the Gen AI used is provided in the description files, which must be uploaded to digital platforms along with the prepared materials. In addition to the attributive information (names and links), it is also necessary to describe the context of use, goals and objectives of use (in the case of Gen AI), the text of the request is indicated.

**5.12** The use of artificial intelligence systems by students during the final control is regulated by the current Rules for conducting exams, the Rules for conducting examination sessions with DOT and the Regulations on checking text documents of students for the presence of borrowings.

**5.13** In cases where AI systems are used to assess students' knowledge and skills, the teacher and the graduating department are obliged to guarantee the fairness and objectivity of these assessments. If necessary, it should be possible for the teacher to review the grades.

**5.14** Responsibility for the results of the use of artificial intelligence in the educational process rests with students and teachers. They are required to familiarize themselves with the technical and technological limitations of this technology before using it, as well as take all necessary actions and follow the established sequence of steps to ensure the reliability of the results obtained.

**5.15** In the case when AI systems are necessarily used in a discipline, all contexts and conditions for the use of AI technologies should be fully and exhaustively described in the syllabus of the discipline.

## 6. THE PROCEDURE FOR THE USE OF AI IN THE FINAL QUALIFYING PAPERS AND SCIENTIFIC RESEARCH

**6.1** In the case of using generative AI technologies in the preparation of final qualifying papers and scientific research, scientific results, provisions, recommendations and conclusions should be formulated by the author independently.

**6.2** The use of generative AI technologies without a reference to them indicating the name, manufacturer (copyright holder), version and date of application and (or) use violates the principle of academic integrity.

**6.3** It is not allowed to use technical means and techniques, including generative AI technologies, in order to reduce or eliminate the possibility of plagiarism detection.

**6.4** The author of the final qualifying work and/or scientific research/dissertation is responsible for the reliable, safe and ethical use of information obtained using generative artificial intelligence technologies.

**6.5** The author of the final qualifying work and (or) scientific research /dissertation informs about the use of AI technology by referring to it, including a description of at what stages of scientific research and how the author applied the technology of generative artificial intelligence, as well as a description of methods and methods for verifying the reliability of the data obtained in this way and (or) their processing and interpretations. The lack of information about this indicates that the author confirms the absence of facts about the use of AI technologies in his work.

**6.6** The use of generative artificial intelligence technologies by the author in the preparation of the work is allowed with the prior approval of scientific consultants and the local ethical commission.

## 7. ETHICAL ISSUES OF AI APPLICATION

**7.1** Teachers are required to ensure transparency in the use of AI systems, inform students about how and for what AI technologies are used in the educational process, as well as what data is collected and how it is processed.

**7.2** Teachers should provide students with the opportunity to familiarize themselves with the principles of operation and algorithms of the AI systems used, contributing to the development of their critical thinking and understanding of possible biases or limitations of these systems.

**7.3** The use of AI in the educational process must comply with the principles of confidentiality and protection of personal data. Teachers are required to inform students about what data is collected by AI systems and how the digital footprint of students is formed.

**7.4** When using AI in the educational process, teachers do not have the right to require students to disclose personal data.

**7.5** Teachers should create conditions so that the use of AI systems contributes to improving the quality of the educational process, and does not replace the direct interaction of the teacher and the student. AI should be a tool to support and complement, not replace, traditional learning methods.

**7.6** The graduating department is required to regularly evaluate and review the application of AI systems to ensure their effectiveness and ethics, taking into account feedback from students and teachers, as well as the latest research and development in the field of AI.

**7.7** Teachers are required to ensure accessibility and support for all students when using AI systems, including the provision of instructions, training materials and advice for the development and effective use of these technologies.

**7.8** The use of AI should be aimed at supporting academic integrity and preventing the use of these systems for fraud or other unethical practices.

**7.9** Teachers should encourage interdisciplinary collaboration and knowledge sharing in the field of AI, contributing to the integration of different approaches and views on the ethical application of these technologies in the educational process.

**7.10** When introducing new AI systems into the educational process, teachers of the discipline and the graduating department should conduct a preliminary assessment of their impact on students, taking into account possible risks and benefits, and ensuring informed consent of all participants in the educational process on the use of the AI system.

**7.11** In case of conflict situations related to the use of AI in the educational process, the graduating department is obliged to provide mechanisms for their resolution, including the possibility of appeal and review of decisions made on the basis of AI systems.

**7.12** When using AI systems, it is necessary to respect the different opinions and approaches of teachers and students when discussing the use of AI, and to promote the creation of an inclusive learning environment.

**7.13** Students are required to inform teachers of any vulnerabilities or shortcomings found in AI systems in order to prevent possible abuses or errors in the educational process.

**7.14** Students are required to use AI systems in the educational process only in accordance with the established rules and recommendations of teachers, avoiding attempts to use AI for fraud or deception.

**7.15** When working with AI systems, students should respect the confidentiality and personal data of their colleagues, avoiding actions that may lead to a violation of privacy or unauthorized access to information.

**7.16** When using AI systems, it is necessary to critically evaluate the results, and not rely on them unconditionally. It is necessary to develop skills in analyzing and verifying data obtained using AI.

**7.17** When creating your own projects and research using AI, it is necessary to observe academic honesty, avoiding plagiarism and properly quoting all sources and algorithms used.

**7.18** When applying AI systems, the principles of fairness and inclusivity must be respected, and AI systems should not be used to create or distribute biased or discriminatory materials.

**7.19** When conducting research using Gen AI, it is necessary to ensure that the material created by Gen AI does not violate the rights of other people and that all data used in the research was obtained and processed in a lawful and ethical manner.

**7.20** The use of AI for purposes that may be harmful or unethical is strictly prohibited in accordance with University policy and international standards.

# 8.  RECOMMENDATIONS FOR TRAINING IN THE USE OF AI

**8.1**      University staff using artificial intelligence technologies must have the following competencies:
−    technical skills: understanding the basic concepts and methods of artificial intelligence;
−    pedagogical competence: the ability to effectively explain the technical aspects of AI application to students with different levels of training, ensuring their full understanding;
−    flexibility and adaptability: readiness for continuous learning and adaptation to the rapidly developing field of artificial intelligence, as well as awareness of the latest developments and technologies;
−    analytical skills: the ability to analyze specific situations and identify potential applications of AI in various fields;
−    interdisciplinary approach: the ability to integrate knowledge from various fields such as computer science, mathematics, psychology and others;
−    ethical consciousness: awareness and understanding of ethical issues related to the use of artificial intelligence.

**8.2**      Students using AI technologies should have the following competencies:
−    have basic knowledge in the field of artificial intelligence and related technologies;
−    understand and adhere to ethical principles, including respect for human rights, data privacy and prevention of discrimination;
−    know the rules of academic policy, academic integrity and copyright. The application should be coordinated with course managers and academic supervisors, especially if it affects data belonging to third parties or requires additional resources;
−    students should be able to collect, clean and analyze data for use in AI systems, as well as possess data protection methods and ensure their confidentiality and integrity.

**8.3** In order to provide employees and students with the competencies specified in clauses 8.1, 8.2 of these Regulations, the University organizes training in the field of AI technology, including:
−    conducting technical trainings to teach skills in working with AI systems, including basic knowledge in the field of machine learning, natural language processing and other AI technologies;
−    specialized advanced training courses, summer schools and workshops dedicated to the use of AI for educational purposes;
−    consulting experts in the field of AI in the form of online resources, lectures or personal consultations;
−    training on ethical aspects in the use of AI, including discussion of transparency, responsibility, confidentiality and prevention of bias;

– participation in projects related to AI in education, gaining practical experience.

**8.4** The organization of training for University staff in accordance with paragraph 8.3 of this Regulation is carried out by the structural divisions of the Department for Academic Affairs, the Department for Ensuring the Development of It Infrastructure, the Department for Science and Innovation, as well as the graduating departments of faculties.

**8.5** The organization of training in accordance with paragraph 8.3 of this Regulation for students is carried out by the graduating departments of the faculties.

**8.6** In order to develop AI application skills, faculties include the disciplines "Fundamentals of Artificial Intelligence" in their educational programs. The discipline is designed to familiarize students with the basic concepts, methods and applications of AI. The course aims to provide students with basic knowledge about the possibilities and applications of artificial intelligence in the modern world, as well as its importance for various fields of activity. The structure and content of the discipline is adapted by the faculties to the profile of personnel training.