SATBAYEV UNIVERSITY	Non-Profit Joint Stock Company Kazakh National Technical Research University named after K.I. Satbayev
	Competence model of a graduate type of regulatory document

COMPETENCE MODEL OF A GRADUATE
Kazakh National Technical Research University named after K.I. Satbayev

according to educational programs:

«7M07143 Chemical technology of inorganic substances»

of training directions 7M071 Engiheering and engineering affairs

Group of educational programs: M097 Chemical Engineering and Processes

qualification «7M071 – Engiheering and engineering affairs»
(Master of Technical Sciences)

Almaty 2025

«Approve»
Director of Mining and
Metallurgical Institute
named after O.A. Baikonurov
_____ Rysbekov K.B.
«__»_____ 2025

COMPETENCE MODEL OF A GRADUATE

The Competence Model of the graduate is a generalized image of the graduate, reflecting the totality of his personal qualities, professional and universal competencies, which he must have upon completion of training within a specific educational program.

The purpose of the graduate model: to designate the ideal result of the educational process, on which the university's higher education system is focused.

The graduate model is developed taking into account the following:

- Mission, vision and strategic goals of Satbayev University;
- Needs and changes in the labor market (including digital transformation, sustainable development, ESG approaches and global trends);
- Recommendations of employers, industry experts, internal and external stakeholders;
- Requirements of professional standards, the National and Sectoral Qualifications Framework of the Republic of Kazakhstan;
- Principles and levels of the Dublin descriptors, aligned with the European Higher Education Area (QF-EHEA).

The structure of the graduate's competence model includes:

1. Professional competencies

- Formed on the basis of the profile of the educational program;
- Reflect the graduate's readiness to solve problems in a specific professional field;
- Take into account modern technologies, methods and tools of work in the industry.

2. General professional competencies

- The ability to apply theoretical knowledge in practice;
- Proficiency in analysis, design, and project management;
- Communication in a professional environment, including in foreign languages.

3. Universal (core) competencies

- Critical and systemic thinking;
- Ability to learn independently and adapt to changes;
- Ethical and academic integrity;
- Civic engagement, environmental and digital culture;
- Interdisciplinary communication and teamwork skills.

Purpose of the model:

- Used in the design and updating of educational programs;
- It is the basis for the formation of curricula, LO (learning outcomes), modular systems, and syllabuses;

- It allows to ensure that graduates meet the requirements of the national and international labor market.

Table 1

Competence model of a graduate according to the Master's degree program «7M07143 Chemical technology of inorganic substances»

№	Type of competence	Name of competence	Description (learning outcome)
1	Universal (core) competencies	General cultural competencies	**ON2** To develop such personal qualities as creativity, responsibility, tolerance, the desire for self-development and the disclosure of one's creative potential, including the development and implementation of advanced training courses in the field of training; **ON9** Speak a foreign language at a professional level, allowing you to conduct scientific research in an international context and to teach special disciplines in universities.
2	General professional competencies	Information-analytical and intellectual competencies	**ON4** Analyze, systematize and evaluate the available scientific and technical information on the objects and technologies of inorganic substances related to quality control of products, processes and services, interpret modern achievements within the research context and provide legal protection and commercialization of scientific results; **ON11** Use the acquired knowledge, skills and abilities to solve specific professional tasks and assess technological and environmental risks.
3	Professional competencies	research and production activities	**ON5** To use the knowledge of modern technologies for the production of new inorganic substances and recycling of industrial waste to create them, as well as regulatory legal acts, international standards regulating the quality and safety of products, processes and services in solving practical and research tasks; **ON6** Optimize the parameters of technological processes and equipment to improve the efficiency of methods for processing mineral raw materials and the production of inorganic substances and materials; **ON7** To improve the methods of analytical quality control of raw materials, materials and marketable products; own modern methods of scientific research, set and formulate the tasks of research work.

		organizational and managerial activities	**ON8** Effectively manage chemical and technological processes to obtain competitive products and minimize associated environmental risks; **ON12** Develop plans and programs for organizing innovation activities at chemical enterprises for the production of inorganic substances and materials.
		scientific and pedagogical activity	**ON1** To develop innovative educational programs using modern pedagogical and communication technologies in accordance with the demands of the labor market; plan and organize processes of training and human resource management in professional activities; **ON3** Possess the skills of forming and presenting educational material in various forms, conducting laboratory and practical classes, managing the research work of students; **ON10** Carry out pedagogical activities in educational institutions based on modern teaching methods and the requirements of pedagogy and psychology of higher education.

Qualification characteristics of an OP graduate educational program by EP «7M07143 Chemical technology of inorganic substances».

1. The field of professional activity of a graduate

The scope of activity includes:

- industrial chemical enterprises of various forms of ownership;
- factory, workshop, and research institutes and laboratories;
- engineering companies;
- technical universities.

2. Objects of professional activity

- natural, secondary, and technogenic raw materials necessary for the production of inorganic substances, methods of their processing;
- technological processes for obtaining inorganic substances and materials, and the technological equipment used for this purpose;
- methods of studying the composition, structure, and properties of inorganic materials and substances under various conditions;
- interactive forms and innovative teaching methods in modern universities.

3. The subject of professional activity

- analysis, design, operation, development, implementation, and management of objects and processes in the professional field.

4. Types of professional activity of a graduate

- research;
- research and production;
- design and process;

- organizational and management;
- scientific and pedagogical.

5. Functions of professional activity

- planning and organization of work processes;
- development and implementation of technological solutions;
- quality control, security and process support;
- analysis, modeling, and optimization of systems and solutions;
- interaction with the team, clients, and partners.

Classifiers and scope:

- International Standard Classification of Education (ISCED) level: 7M07143 Chemical technology of inorganic substances.
- National Qualifications Framework of the Republic of Kazakhstan level: 7.
- Industry Qualifications Framework level: 7.
- Educational program scope: 120.
- Academic degree awarded: Master of Technical Sciences.

Head of the Department of Chemical Processes and Industrial Ecology

Kubekova Sh.

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