

NON-PROFIT JOINT-STOCK COMPANY "KAZAKH NATIONAL RESEARCH TECHNICAL
UNIVERSITY named after K.I. SATPAYEV"



Institute of Architecture and Construction named after T.K. Basenov
Department of "Construction and Building Materials"

GRADUATE MODEL
Master`s degree program
7M07325 - "Production of building materials, products and structures"

Almaty 2024

1. Description of the educational program

The educational program "Production of building materials, products and structures" is developed in accordance with the National Qualifications Framework, professional standards and aligned with the Dublin descriptors and the European Qualifications Framework. The educational program is focused on learning outcomes.

Dublin descriptors, which are a description of the level and scope of knowledge, skills, abilities and competencies acquired by students upon completion of the educational program of each level (stage) of higher and postgraduate education, are based on learning outcomes, competencies formed, as well as the total number of ECTS credit (credit) units.

The educational program "Production of building materials, products and structures" is aimed at research and teaching activities. The program, on the one hand, is based on centuries-old experience in the production of building materials and products, on the other hand, motivates graduates for creative participation and initiative in the development of new, modern methods of production of innovative building materials, including the use of nanostructuring additives.

The graduate will be able to carry out professional activities:

- at manufacturing enterprises working in the field of production of building materials, products and structures, as well as in academic and departmental research organizations and educational institutions,
- in technological, production, research, management departments and services of enterprises and organizations involved in ensuring, organizing and controlling the environmental safety of technological processes;
- as head of the laboratory at enterprises producing building materials based on binders modified with nanostructuring components.

Graduates of the educational program acquire skills to master and develop new technologies and equipment used in the production of building materials, products and structures. This is facilitated by the inclusion in the program of projects on modules, forming, along with professional competencies, the ability to work in a team and the development of the necessary leadership skills.

2 Awareness and formulation of the basic goals (objectives) of the educational program (EP) 7M07325 - "Production of building materials, products and structures"

2.1 Objectives of the Master's degree program

Training of qualified, competitive specialists focused on applied, scientific, research activities in the field of production of building materials, products and structures for construction industry enterprises.

2.2 Educational Program Objectives:

- study and analysis of scientific and technical information, domestic and foreign experience in the field of activity;
- setting a scientific and technical task, choosing methodological methods and means of solving it,
- Preparation of data for the preparation of reviews, reports, scientific and other publications;
- setting up and conducting experiments, metrological support, collection, processing and analysis of results, identification of theory and experiment;
- development and use of databases and information technologies for solving scientific, technical and technical-economic tasks in the field of activity;
- presentation of the results of the work performed, organization of the implementation of the results of research and practical developments;
- Development of abstracts of lecture courses and practical exercises in the disciplines of secondary vocational and higher education;
- conducting classroom classes, directing course design, educational and production practices of students.

3 Requirements for assessing the learning outcomes of the educational program

Description of the mandatory standard requirements for graduation and awarding the academic degree of Master of Technical Sciences: mastering at least 120 academic credits. The content of the Master's degree program consists of:

- 1) theoretical training, including the study of cycles of basic and core disciplines;
- 2) practical training of undergraduates: various types of practices, scientific or professional internships;
- 3) research work, including the completion of a master's thesis, for the scientific and pedagogical master's degree
- 4) final certification.

Descriptors of the level and scope of knowledge, skills, and competencies

The requirements for the master's degree level are determined on the basis of the Dublin descriptors of the second level of higher education (Master's degree) and reflect the acquired competencies expressed in the achieved learning outcomes. Learning outcomes are formulated both at the level of the entire Master's degree

program and at the level of individual modules or academic disciplines. Descriptors reflect learning outcomes that characterize the student's abilities: 1) demonstrate developing knowledge and understanding in the studied field of science and technology related to the design, construction, operation of buildings and structures, civil and industrial purposes, as well as the production of building materials, products and structures based on advanced knowledge of the construction industry, when developing and (or) applying ideas in the context of research; 2) apply their knowledge, understanding and abilities at a professional level to solve problems in a new environment, in a broader interdisciplinary context; 3) collect and interpret information to form judgments taking into account social, ethical and scientific considerations; 4) clearly and unambiguously communicate information, ideas, conclusions, problems and solutions, both specialists and non-specialists; 5) learning skills necessary for independent continuation of further education in the studied field of design, construction, operation of buildings and structures, civil and industrial purposes, as well as from the production of building materials, products and structures.

4. Learning outcomes of the educational program and the matrix of correlation of learning outcomes of the educational program as a whole with the formed competences

PO1 - Demonstrates the ability to study objects and processes in the field of construction, as well as organizing work on testing building materials, products and structures, obtaining a patent for the results of the study.

PO2 – Analyzes, critically comprehends and presents information, searches for scientific and technical information, acquires new knowledge, including with the help of information technologies; develops educational and methodological materials on the subjects taught, taking into account the integration of education, science and innovation.

PO3 – Sets and solves scientific and technical problems in the field of construction, the construction industry and the technology of production of building products and structures based on knowledge of the problems of the industry and experience in solving them, improves professional qualifications.

PO4 – Perceives, analyzes and implements managerial innovations in professional activities, including in a foreign language.

PO5 – Skillfully solves the problems of professional activity using theoretical and practical foundations, the mathematical apparatus of fundamental sciences.

PO6 – Uses and develops design, administrative documentation, and also participates in the development of regulatory legal acts in the construction industry.

PO7 – Resolves issues related to the organization of the production process, as well as processes and analyzes the results obtained from theoretical and experimental studies.

PO8 – Substantiates the choice of technical solutions for technological lines for

the production of building materials, products and structures, as well as organizes and manages the technological process for the production of building materials, products and structures.

PO9 – Demonstrates knowledge and ability to solve problems in new situations within interdisciplinary areas related to the construction field.

PO10 – Organizes, manages the work of the team, developing a team strategy to achieve the goal, uses modern communication technologies, including in foreign languages, in the process of intercultural interaction.

**Head of Department
"Construction and building materials"**

D.A. Akhmetov

Considered at the meeting of the department
Protocol No. 12 of 10.01.2023