

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
**7M07319 - "Civil engineering and production of building materials and
structures"**

Almaty 2024

1. Description of the educational program

The educational program "Civil engineering and production of building materials 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 "Civil engineering and production of building materials and structures" is aimed at production and technological activities.

The graduate will be able to carry out professional activities:

- master of engineering and technology: design institutions; bureaus; companies, firms and organizations (enterprises) of construction, transport and communication, road construction, mining, oil and gas and military complexes; companies, firms and organizations (enterprises) of other economic infrastructures.

Professional competence: - training of specialists in the profile for work, regardless of the forms of ownership and subordination: in design institutions; in bureaus; in companies, firms and organizations (enterprises) for example, in companies, firms and organizations (enterprises) of other economic infrastructures. The inculcation of managerial skills and providing training for professional managers (the heads of the General profile on all aspects of management activity).

The objects of professional activity of the master are: design bureaus, design institutes; construction organizations and firms, akimats, ministries.

Masters of the specialty 7M07319 " Civil engineering and production of building materials and structures" can perform the following **types of professional activities**:

- Calculation and design and technical and economic;
- organizational and managerial support;
- production, technological and operational;
- legal, expert and Advisory services;

Settlement and design and technical and economic activities:

- production of appropriate calculations of structural elements of buildings and structures of transport and communication and oil and gas complexes;
- preparation of projects and feasibility studies for the construction of new, repairs, current maintenance and reconstruction of existing objects of transport and communication and oil and gas complexes.

Organizational and managerial activities:

- organization of the work of the labor collective of performers with the creation of the necessary conditions, equipping (providing) production with labor and material resources, making optimal management decisions in various production conditions;

- finding optimal solutions in the event of labor disputes on staffing, wages, cost and quality of various types of work, ensuring the safety of life, labor protection and compliance with environmental safety in production areas;

- assessment of production and non-production costs to ensure the quality of products of construction and repair production;

Production, technological and operational activities:

- planning and solving technological problems encountered in the production process;

- efficient use of materials and raw materials, equipment, machinery, modern computer programs for calculating and designing parameters of technological processes;

- organization and effective implementation of input quality control of raw materials, production control of semi-finished products and parameters of technological processes, quality of finished products;

- engineering and technical operation of buildings and structures.

Legal, expert and consulting activities:

- possession of basic knowledge in the field of civil, financial, commercial and other branches of law;

- ability to navigate the current legislation and the ability to apply certain legal norms in practice;

- conducting expertise and providing consulting assistance in various production situations.

2 Awareness and formulation of the basic goals (objectives) of the educational program (EP) 7M07319 - "Civil engineering and production of building materials and structures"

2.1 Objectives of the Master's degree program

Training of specialists in the design, construction and operation of industrial and civil buildings and structures, as well as the production of building materials, products and structures.

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: mastering at least 60 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) 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 - Have the ability to analyze, critically comprehend and present information, search for scientific and technical information, acquire new knowledge, including with the help of information technology.

PO2 – Be able to economically substantiate issues related to the organization of the production process, process and analyze the results of theoretical and experimental research in the field of determining the volume and quality indicators of construction enterprises, the technical level and operational condition of construction structures.

PO3 – Have knowledge of computer modeling of structures of buildings and structures, construction production; selection of adequate calculation models of the objects under study; analysis of the capabilities of software and computer systems for calculating and designing structures and structures, as well as the production process.

PO4 – Possess the skills of qualified forecasting of construction processes based on static data; be able to make a technical assessment of domestic and foreign projects; make strategic plans based on conclusions for practical application; as well as develop methods of rational organization of production processes in the field of construction.

PO5 – Be able to conduct experimental research in the field under study using modern equipment and software systems.

PO6 – Possess methods of communication in oral and written form when solving tasks in professional activity, including in a foreign language.

PO7 – Be able to make informed decisions on the choice of management structures for the effective operation of construction enterprises; use modern technologies to form the development goals of the organization.

PO8 – Possess the ability to analyze advanced scientific and technical experience and trends in the development of innovative technologies in the field of construction, operation of buildings and structures and production of building materials, products and structures.

PO9 – Have the ability to use in-depth knowledge of legal and ethical norms in assessing the consequences of their professional activities, in the development and implementation of socially significant projects.

Head of Department
"Construction and building materials"

D.A. Akhmetov

Considered at the meeting of the department
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