



## Review

### **to the Bachelor degree program 6B07203 - " Metallurgy and mineral processing", developed by the departments "Metallurgical processes, heat engineering and special materials" and "Metallurgy and mineral processing" NJSC "Kazakh National Research Technical University named after K.I. Satbayev" (2020-2021 recruitment years)**

The peer-reviewed educational program 6B07203 - "Metallurgy and Mineral Processing" includes fundamental, general engineering and professional training in the field of metallurgy in accordance with the development of science and technology, as well as the changing needs of production.

A distinctive feature of the program. The educational program "Metallurgy and Mineral Processing" is based on the specialties "Metallurgy" and "Mineral Processing" and includes fundamental, natural science, general engineering and professional training of bachelors in the field of metallurgy and beneficiation in accordance with the development of science and technology, as well as the changing needs of mining - metallurgical industry.

A distinctive feature of the program is that the program gives the graduate the adaptation to the production sector, due to the content in the educational program of 40 % of general engineering disciplines. The graduate receives a fundamental set of general engineering disciplines, as well as the maximum set of specialized disciplines. The program provides an in-depth study of the theory of enrichment and metallurgical processes, metallurgical heating engineering, the theory of furnaces, the design and design of metallurgical units, physical and chemical methods of analysis, software for calculating physical and chemical processes, technological processes for obtaining powder, composite materials and coatings of high quality and increased consumer properties. Graduates have knowledge of the technology of metallurgical production of ferrous, non-ferrous, noble, radioactive, rare and other metals.

The objectives of the educational program are:

- providing knowledge, skills and abilities in the following types of professional activities: production and technology; organizational and managerial; research; design at the republican and international levels.

- training of highly qualified personnel for engineering activities at enrichment and metallurgical enterprises, in a research organization or commercial structure, with the prospect of further professional growth.

A modern educational program allows you to specialize in:

- enrichment of minerals - a set of processes of primary processing of mineral raw materials, as a result of which all valuable minerals are separated from waste rock, as well as the mutual separation of valuable minerals. The products (concentrates) obtained as a result of beneficiation must meet the technical and economic requirements of subsequent metallurgical processing in terms of their quality.



- extractive metallurgy - extractive metallurgy that extracts all known metals. The graduate has the ability to analyze raw materials and apply the best metal recovery method; apply technologies of pyro-hydro-, electrometallurgy; their knowledge and skills can influence the reduction of waste and environmental pollution; influence the optimal fuel consumption, the ability to perform technical, heat engineering, heat power, metallurgical calculations; carry out the design of workshops.

- physical metallurgy - an industry that provides skills and studies the physical state of metals, their properties, the effects of various environments, stress and pressure; testing of metals for compliance with quality and safety standards; perform various analytical, physicochemical methods of analysis.

- technological metallurgy - an industry where metal parts are designed and the processes by which they are formed are controlled, the graduate has the skills of casting, forging, welding, rolling, etc. Experienced teaching staff and leading practitioners are involved in the implementation of the program. The peer-reviewed educational program has a high level of provision with educational and methodological documentation and material and technical resources. The number of credits provided for the performance of the undergraduate educational program of at least 240 credits meets the standards of Worcester Polytechnic Institute.

In general, the educational program 6B07203 - "Metallurgy and mineral processing", developed and implemented in the NJSC "KazNRTU named after K.I. Satbayev ", meets the requirements of the state educational standard and the basic requirements of professional standards, contributes to the formation of professional competencies and meets the criteria for educational programs of international accreditation, as well as a partner university, which is Worcester Polytechnic Institute for the educational program 6B07203 -" Metallurgy and minerals processing ". Worcester Polytechnic Institute (USA) is the base for academic mobility of undergraduate 6B07203 - "Metallurgy and mineral processing" in accordance with a cooperation agreement between our universities.

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Professor & Director

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