

EXPERT OPINION

on the developed modular education programs of Vocational Master's program on specialty 6M070900 "Metallurgy" of S. Toraighyrov Pavlodar State University

Educational programs have the following directions:

- Technological innovations in the processing of metallurgy enterprises waste;
- Technological innovation in the rolling and tube production;
- Project management in industry.

The educational programs are developed within the State Program of Industrial-Innovative Development of Kazakhstan for 2015 - 2019, whose main objectives are to improve competitiveness through diversification and modernization, the development of a competitive domestic production, innovation for complex processing of ores, the release of new products for base metals related sectors of the economy, the modernization of logistics and development of the industrial base of branch institutes.

The term of study at an educational program of profile Magistracy on "Metallurgy" is 1.5 years with 90 ECTS.

The educational program includes general and special modules that provide the formation of the economic, administrative, fundamental research and applied skills.

These modules provide advanced training in the field of materials science, engineering, assessing the level of safety and environmental friendliness of production, production management, an interdisciplinary area of knowledge that includes the study of the structure, properties, processing and application of metallic materials.

General and specific competencies that graduates acquire within the specialty "Metallurgy":

- Have the ability to innovation, entrepreneurship and self-development;
- Know the current state and prospects of development of the metallurgical complex of Kazakhstan and Pavlodar region;
- Know a foreign language to the extent necessary for the professional activity;
- Be able to work in a team, build a professional qualification structure of the unit, manage staff;
- Be able to plan and organize the implementation of the production plan department, to analyze industrial activity units and maintain control of the implementation of planned targets;
- Be able to organize and supervise the enforcement of the requirements of occupational health and safety;
- Be able to organize innovative activities in the enterprise, to develop and improve production processes in order to improve energy and resource efficiency, quality of products;

- To have a problem-solving skills and the organization of environmental management waste production;
- Have the skills of correct use of information resources;
- Have the skills of inspection, verification, audit materials and metallurgical processes;
- Have the skills to conduct research in materials studies and metallurgy;
- Have the skills to release all kinds of expert reports on materials and processes to experts and non-professionals.

Graduates of the master's program are able to work in their professional field in the metallurgical and related industries, in areas related to materials research, production, environment, innovation, management of the company.

We believe that the structure and content of educational programs of Vocational Master's program on "Metallurgy" specialty corresponds to similar Master's programs of the European educational space, and allow reaching the planned learning outcomes.

**Lund University,
Faculty of Engineering,
Professor, PhD**



A handwritten signature in blue ink, consisting of several loops and curves, positioned above the printed name.

Ronny Berndtsson