8D07201 – Mineral Beneficiation (Scientific and Pedagogical Track)

Program Uniqueness:

The program is aimed at training highly qualified scientific and academic personnel capable of conducting fundamental and applied research in the field of mineral processing. Special attention is given to the development of innovative technologies for fine and selective beneficiation, process modeling and digitalization, the use of intelligent control systems, and sustainable approaches to processing complex ores.

Doctoral students receive systematic training in higher education pedagogy and research methodology, enabling them to develop their own scientific schools and effectively transfer knowledge within academic settings. The program also prepares students for publishing in high-impact journals and participating in international research projects.

8D07204 – Metallurgical Engineering (Scientific and Pedagogical Track)

Program Uniqueness:

This program trains leaders in research and education in metallurgy, equipping them with competencies in the development and optimization of modern metallurgical processes, including zero-waste technologies, recycling, electrometallurgy, and extractive metallurgy of non-ferrous and rare metals.

The curriculum offers in-depth training in scientific research methodology, higher education pedagogy, and didactics, allowing graduates to successfully combine research with teaching. Emphasis is placed on the development of original scientific approaches, the design of innovative technological solutions, and work in interdisciplinary scientific environments.

8D07212 – Metallurgical Engineering (Professional Track)

Program Uniqueness:

This program focuses on preparing specialists capable of implementing advanced metallurgical solutions in industrial practice. Training includes the development and optimization of technological processes using modern tools such as modeling, big data analysis, digital twins, and sustainable technologies for processing secondary resources and metallurgical waste.

The main emphasis is on applied research aimed at increasing productivity, reducing costs, and minimizing environmental impact. The program prepares innovation-driven engineering leaders capable of designing and implementing their own technological solutions within industrial projects.

8D07213 – Extractive Metallurgy and Advanced Materials (Professional Track)

Program Uniqueness:

The program has been developed in line with leading global trends such as Green Metallurgy, digitalization of production processes, sustainable development, and the transition to zero-waste technologies. It integrates the latest concepts from the Atlas of Emerging Professions in the field of environmentally friendly

metallurgy and is aligned with the development strategy for advanced materials, including fluoride technologies, intelligent and self-adaptive materials, nanostructured and biocompatible materials, as well as products of the uranium industry.

The program develops competencies in programmable materials, additive manufacturing, and the integration of artificial intelligence into metallurgical production control systems. A significant portion of the training is based on interdisciplinary research combining nanotechnology, materials science, machine learning, and chemical engineering.

8D07214 – Mineral Beneficiation (Professional Track)

Program Uniqueness:

This professional program targets the preparation of industry experts and researchers capable of solving practical problems in real-world production settings. The focus is on the development and implementation of new beneficiation schemes tailored to specific deposits, along with the use of modern analysis tools and digital platforms to improve processing efficiency.

The program enhances applied research skills, techno-economic justification of technological solutions, and their implementation in industry. Graduates are prepared to lead project teams, manage technology transfer, and drive innovation in the mining and beneficiation sector.