

REVIEW

for the educational program 7M05301 – «Applied and Engineering Physics»

The current stage of scientific and technological development is characterized by the growing role of physics as the foundation of innovative technological progress. The transition to a knowledge-based and innovation-oriented economy requires the training of specialists capable of applying fundamental physical principles to solve practical engineering problems. Applied and Engineering Physics represents an interdisciplinary field that combines scientific research and engineering approaches to the creation, improvement, and practical implementation of physical technologies in various sectors of the economy.

Innovative activity in this field is closely related to the development and implementation of advanced physical methods and technologies, including nanotechnology, optoelectronics, plasma, laser and quantum technologies, energy-efficient systems, as well as sensor and diagnostic devices. These areas play a key role in shaping the new technological infrastructure of modern society.

The educational program 7M05301 – «*Applied and Engineering Physics*» (hereinafter referred to as the EP) was developed by the Department of Materials Science, Nanotechnology and Engineering Physics of the O.A. Baikonurov Mining and Metallurgical Institute at Satbayev University. The aim of the program is to train highly qualified specialists possessing both fundamental knowledge in physics and practical skills in engineering research and design. The program is designed for master's students specialising in the development of physical methods of analysis, modelling, measurement, and the creation of new functional materials and devices.

The EP includes both basic and specialised disciplines aimed at developing systematic scientific thinking, research competencies, and practical engineering skills. The basic disciplines cover modern methods of scientific research, processing and interpretation of experimental data, and mathematical modelling of physical processes.

The specialised disciplines provide an in-depth study of the applied aspects of modern physics, such as optics, electronics, semiconductor physics, nanostructures, sensor systems, and materials science. The curriculum also includes the study of modern computer simulation technologies and instrumental analysis methods, as well as courses on quality management and innovation management in engineering practice.

The program is focused on developing research and analytical skills among master's students, enabling them to design and implement physical technologies in industry, energy, medicine, environmental protection, and information technologies. Such initiatives of the department contribute to the preparation of a new generation of specialists capable of integrating fundamental knowledge with engineering thinking and an innovative approach to solving scientific and technical problems.

The presented educational program 7M05301 – *Applied and Engineering Physics* is of great importance for the training of future engineers-physicists and is recommended for approval.

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A handwritten signature in black ink, reading "Beh Khipoay" with a stylized flourish underneath.