



The Department of Materials Science, Nanotechnology, and Engineering Physics plans to train specialists in program 6B07109 – Engineering Physics and Materials Science – who will be competitive engineers, physicists, and materials scientists capable of developing and implementing new materials and technologies for industry, energy, construction, and high-tech sectors, taking into account the principles of sustainable development, inclusion, and digitalization.

*The objects of professional activity of graduates are:*

- Research institutes, design bureaus, engineering centers, technology parks.
- Metallurgy, mechanical engineering, construction materials, energy, transportation, and chemical plants, production facilities, engineering services.
- Materials science, physics, and nanotechnology laboratories.
- Quality control and standardization centers, non-destructive testing laboratories.
- Design and evaluation of materials and structures, engineering project support.

Graduates of the educational program are currently employed at leading research institutes and laboratories, in various industries, and in government agencies.

*The main planned activities for the EP:*

1. Curriculum improvement
  - Updating disciplines to meet labor market and industry requirements.
  - Introducing modules on engineering physics of materials, nanomaterials, digital modeling and AI, and sustainable development.
  - Increasing the share of practice-oriented disciplines.
2. Developing students' practical training
  - Organizing educational and industrial internships at enterprises and research institutes.
  - Implementing dual learning.
  - Involving industry specialists in teaching classes.
  - Implementing project-based learning and team-based case studies.
3. Digitalization of the educational process
  - Using LMS (Moodle, Google Classroom, etc.).
  - Training students in Python, MATLAB, and Thermocalc.
  - Using virtual laboratories and simulators.
4. Developing students' research work
  - Engaging students in research starting in their second year.
  - Participation in conferences, hackathons, and scientific schools.
  - Publication of research papers in conferences and journals jointly with faculty.
  - Engaging students in startup and research tracks.
5. Ensuring inclusion and sustainable development
  - Incorporation of SDGs into course content.
  - Developing case studies on green materials and technologies.
  - Training in engineering ethics and social responsibility.
6. Continuing professional development for faculty.
  - Courses on modern materials, AI, and digital methods.
  - Internships in industry.

- International professional development programs (Bolashak, Erasmus, and others).

7. Developing international cooperation with universities in the near and far abroad, through the conclusion of agreements in the areas of research, academic mobility of students, exchange of experience, and continuing professional development for the department's faculty. (2026-2027).

8. Expansion and updating of the department's educational and laboratory facilities through:

- equipping the department's laboratory facilities with research apparatus, equipment, installations, etc.

- concluding a cooperation agreement and opening a department branch with leading research institutes to conduct certain types of practical and laboratory classes at the research institute.

- establishing an "Electrochemistry and Corrosion" laboratory, which will be established within the department. The laboratory will enable testing of materials for corrosion resistance and analysis of the electrical parameters of electric batteries for use in the production of solar panel elements.

9. Quality Assurance System (CQI).

- Regular collection of feedback from students and employers.

- Analysis of improvements in the quality of course delivery to achieve learning outcomes.

- Analysis of graduate employment.

- Annual review of the educational program.

10. Development of the department's material and technical resources. Approval of a list of necessary equipment for training scientific personnel for various industries.