Graduate Model of the Educational Program
6B07103 – Mechanical Engineering

Upon graduation, the graduate should be able to:
Skills:

- Utilize basic methods for processing experimental research data, analytical and numerical solutions of differential equations.
- Solve the main equations of mathematical physics analytically and numerically.
- Apply programming and leverage the capabilities of computer software.
- Use methods and tools of engineering and computer graphics.
- Calculate mechanical transmissions and joint parts for strength.
- Control measurement quality and plan measurements.
- Test statistical hypotheses and apply statistical methods for quality control, defect analysis, and investigation of technological processes.
- Process databases, conduct expert quality evaluations using them, and employ databases for statistical analysis and summarizing results.
- Analyze key indicators of an enterprise's financial and economic performance.
- Define production programs and production capacity.
- Calculate the cost and labor intensity of products, profitability, and production efficiency.
- Use concepts of financial resources and funding sources.
- Utilize and prepare regulatory and legal documents related to professional activities.

Knowledge and Understanding:

- Understand the production structure of an enterprise, types of specialization, and production types.
- Comprehend the production cycle and its structure, as well as the organization of flow production.
- Organize production maintenance.
- Grasp the basics of organizing technical preparation for production.
- Understand the fundamentals of organizing technical maintenance of production.
- Manage the technical control of produced products.
- Recognize the peculiarities of resource utilization in an enterprise and the allocation of main production assets and working capital.
- Understand the basics of mechanism design and the stages of their development.
- Grasp general theorems of dynamics, analytical dynamics, and impact theory.
- Classify mechanical, thermal, and electrical measurements.
- Apply methods and tools for measuring and controlling mechanical, thermal, and electrical quantities.
- Understand the organizational, scientific, and methodological foundations of mechanical engineering production.
- Recognize the regulatory and legal framework of metrology, standardization, and certification.

- Use statistical methods to analyze causes of production defects, quality control methods during operation, repair, and disposal of products.
- Understand the basics of life safety, as well as the organizational, legal, and technical foundations of occupational safety and safety techniques.

Competencies:

- Select the most rational materials, forms, sizes, degrees of precision, and surface roughness, considering mechanical, physical, chemical, and technological properties of metals, as well as methods of mechanical, thermal, and chemical-thermal processing, manufacturing technologies, and technological processes.
- Apply knowledge and understanding to solve tasks related to organization, management, maintenance, and the introduction and operation of low-waste, resource-saving, environmentally friendly mechanical engineering technologies and processes, considering safety, environmental compatibility, and structural strength of components and mechanisms.
- Plan the equipment needs of an enterprise, including hydro-pneumatic and lifting-transport machines, and implement innovative technological processes in production.
- Develop design, technological, and operational documentation for new technologies and engage in computer modeling of processes using CAD systems and additive technologies.
- Design technological processes for manufacturing various types of products, equipment, tooling, instruments, and devices.
- Automate and digitize mechanical engineering production, including automated complexes, flexible automated systems, and continuous flow production processes.