

OP 6B07131-Design and technology in mechanical engineering

The purpose of the educational program is to train qualified and in-demand specialists in the labor market who are able to develop and implement innovative technological and design solutions, apply additive, scientific and resource-saving technologies aimed at the sustainable development of mechanical engineering, socio-economic and environmental development of society.

Development plan

1. Updating and developing the curriculum:
 - Updating disciplines with an emphasis on industrial design, 3D modeling, and additive technologies.
 - Introduction of courses on sustainable design, materials science of new materials, environmental engineering.
 - Development of digital competencies: CAD/CAM / CAE systems, VR/AR in design, digital twins.
2. Human resource development
 - Professional development of teachers in the field of digital production and design.
 - Attract practicing designers, engineers, and industry representatives.
3. Infrastructure and digitalization
 - Equipping laboratories with modern production equipment: 3D printers, CNC machines, scanners.
4. Industry relations and international cooperation
 - Development of double degree programs and international internships.
 - Students' participation in research and development projects in cooperation with production facilities.

Evaluation of the effectiveness of the development of the OP

- Analysis of employment and career growth of graduates.
- Reviews from employers and industrialists.
- The level of implementation of student projects and implementation of developments.
- Active participation of students in international and interuniversity events.

Uniqueness of the OP "Design and technologies in Mechanical Engineering"

1. Integration of design and technology

The program combines engineering design and industrial design, developing graduates' abilities to create not only functional, but also aesthetically attractive, competitive products.

2. Practical focus and creative thinking

Training is based on the principles **проектной деятельности** of **project activity** focused on a real order, with an emphasis on developing **creative thinking**, which is especially important in the era of product customization.

3. Modern production technologies

Active use of **additive technologies, CNC, CAD/CAM / CAE systems, digital twins** and other elements of Industry 4.0 allows students to work with advanced tools already in the course of training.

4. Sustainable development as a foundation

The program creates environmental and social awareness, aiming students to **develop resource-saving and environmentally friendly solutions** in mechanical engineering that meet the Sustainable Development Goals (SDGs).

5. Interdisciplinarity

Combining **mechanics, materials science, design, ecology, and economics** allows graduates to adapt to various professional tasks and areas of activity.

6. Demand and flexibility in the labor market

Graduates can work both in the field of industrial design and in engineering services of machine-building enterprises, **developing turnkey products**-from idea to technological implementation.

7. Technologies of the future

The program prepares students to work in the conditions of digital transformation of production, forming their skills **of innovative design**, use **of immersive technologies** (AR/VR), and interaction with artificial intelligence systems.