

Technological Machines and Equipment

South Ural State University

Degree or qualification is awarded: **Bachelor's degree**

Language of study: **Russian**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **no**

Price: **151 800 rubles**

Programme webpage at the university website:

<https://www.susu.ru/en/education/bachelors-specialist-degree-programs/150302-technological-machinery-and-equipment>

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The field of professional knowledge: science and technology, containing a set of tools, techniques, methods aimed at creating competitive products of mechanical engineering and based on the application of modern methods and means of design, calculation, mathematical, physical and computer modeling; organization and production, installation, commissioning, maintenance, operation, diagnostics and repair of hydraulic machines, hydropneumatic systems.

Objects of professional activity:

- Hydraulic machines and hydropneumatic complexes;
- production processes, their development of new technologies;
- means of information, metrological, diagnostic and management support of technological systems to achieve the quality products;
- regulatory and technical documentation,
- standardization and certification systems;
- technological equipment and means of mechanization and automation of technological processes,
- vacuum and compressor machines, hydraulic machines, hydro-drives and hydraulic and pneumatic control systems;
- means of testing and quality control of machines and equipment.

Types of professional activity:

- Industrial-technological;
- design and engineering;
- organizational and managerial;
- Research and development;

Professional activities

Research:

- the study of scientific and technical information, of domestic and foreign experience in the direction of research in the field of production of hydraulic machines and hydraulic and pneumatic control systems;
- mathematical modeling of processes, equipment and production facilities using standard and computer-aided design and research tools;
- conducting experiments using given methods, processing and analysis of the results;
- making technical measurements, writing descriptions of the conducted research, preparing data for scientific reviews and publications;
- writing scientific reports on the conducted research and implementation of research and development results in the field of mechanical engineering;

- organizing protection of intellectual property, classifying research and development results as a trade secret of the enterprise;
- Design and development:
- collection and analysis of initial data for designing engineering products and manufacturing technologies;
- calculation and design of parts and components of mechanical engineering structures in accordance with technical specifications and the use of standard design automation tools;
- development of design and technical documentation, writing documentation for finalized projects;
- project monitoring and technical documentation in accordance with standards, specifications and other normative documents;
- preliminary feasibility study of design solutions;

Production and technological activities:

- monitoring compliance with technological discipline in the process of manufacturing products;
- organization of workplaces, placement of technological equipment;
- organization of metrological assurance of technological processes, the use of standard methods of quality control of products;
- maintenance of technological equipment;
- participation in the work on fine-tuning and development of technological processes which later will be used in the preparation of new products;
- preparation of technical documentation on quality management of technological processes at production sites;
- monitoring compliance with environmental safety in the course of production;
- adjustment, calibration and pilot testing of technological equipment and software;
- installation, calibration, testing and commissioning of new product samples, components and parts of the products;
- checking of technical condition and residual life of technological equipment, organization of preventive inspections and maintenance;
- acceptance and development of input equipment;
- preparation of equipment operating instructions and test programs;
- preparation of applications for equipment and spare parts, preparation of technical documentation for its repair;

Organizational and management activities:

- managing of a small group of workers;
- writing of technical documentation (schedules, instructions, estimates, plans, applications for materials and equipment) and reports using the established forms;
- analysis and evaluation of production and non-production costs in order to ensure the required quality of products, analysis of the results of the production units;
- preparation of initial data for selection and justification of scientific, technical and organizational decisions based on economic decisions;
- performing works on standardization, technical preparation for certification of technical means, systems, processes, equipment and materials;
- development of operational plans for primary production units;
- work planning and payroll fund planning;
- preparation of documentation for the purposes of creation of quality management system at the enterprise;
- organizational-planned calculations for the purposes of creation or reorganization of industrial sites

Specializations within this programme

Metallurgical Machines and Equipment

Technological Machines and Equipment (Hydraulic Machines, Hydrodrives and Hydraulic and Pneumatic Control Systems)

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of design, calculation, mathematical, physical and computer modeling; organization and production, installation, commissioning, maintenance, operation, diagnostics and repair of hydraulic machines, hydropneumatic systems.

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Technological Machinery and Equipment (Technological Equipment Engineering)

Training under this programme allows the graduates to work on creating competitive products in the field of mechanical engineering, as well as to carry out maintenance of high-tech equipment at enterprises of various industries, ranging from food industry enterprises to metallurgical enterprises. When teaching students, the formation of the competencies required by the Federal State Education Standard is carried out using modern teaching methods and tools.

At the disposal of the Department's academic staff there are modern means of designing, mathematical, physical and computer modelling; a wide range of industrial and laboratory equipment, which is intended, from the very first day of training, to provide students with practical acquaintance with the equipment being studied. For the students' internship, course and diploma designing, the Department has close ties both with enterprises of our city and our region, and with the innovation laboratories of SUSU, which are the sites, where students perform research-and-development. The graduates of this educational programme are in demand at the labour market not only in the Chelyabinsk Region, but also across Russia.