

Automation of Technological Processes and Productions

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 rub.**

Programme webpage at the university website:

<https://www.susu.ru/en/education/bachelors-specialist-degree-programs/090301-computer-science-and-computer-engineering>

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In terms of hardware, bachelors study electrical engineering, electronics, circuitry, hardware of modern computers, microprocessors, computer architecture, computer networks of various levels and cloud technologies.

As for the software, programming languages and technologies the following is taught: assembler, C ++, C #, JAVA; Web programming; Linux, Unix operating systems; database (MS SQL server). Intelligent technologies and systems engineering are also part of the program.

Specializations within this programme

Metallurgy of Ferrous, Non-Ferrous, and Rare Metals

Automation of Technological Processes and Productions

Areas of professional knowledge of graduates: methods and techniques aimed at automating existing and the development of new automated technologies, development and production of competitive products; the study, development, implementation and monitoring of rules, regulations and requirements regarding life cycles, processes of development, manufacturing, quality management, application (consumption), transportation and disposal of the products designed for various purposes,; development of tools and systems for automation and control of the life cycle of products and their quality in the context of specific conditions of production on the basis of domestic and international regulations; design and improvement of structures and processes of industrial enterprises within a single information space; creation and application of algorithmic, hardware and software systems of automation, control of technological processes and productions, ensuring the production of high-quality, safe, competitive products and freeing a person fully or partially from direct participation in the processes of obtaining, transformation, transmission, use, information security and production management and their control; ensuring highly effective functioning of automation, control and testing facilities and systems in accordance with the specified requirements, while complying with the rules of operation and safety.

Objects of professional activity:

- production and the equipment of enterprises and organizations, production and technological processes of its production;
- systems of automation of production and technological processes of production, management of their life cycle, quality, control, diagnostics and tests;
- normative documentation;
- technological equipment for automation, management, control, diagnostics, testing of the main and ancillary production, mathematical, information and technical support, software, as well as methods, means and tools for their design, manufacture, debugging, production tests, operation and scientific research in various sectors of

the national economy.

Types of professional activity:

- Research and development

Professional activities:

- participation in the development of practical measures designed to improve the systems and means of automation and control of production, its life cycle and quality, as well as production control of their implementation;
- participation in the development of measures to improve the quality of products, technical support of production, practical implementation of measures in the production;
- implementation of the main and auxiliary equipment in the workplaces; automation, control, control, diagnostics and tests;
- implementation of modern methods and means of automation, control, measurement, diagnosis, testing and management of production;
- identification of the causes of product defects, development of measures to eliminate them, monitoring of technological discipline at workplaces;
- control of compliance of products to the specified requirements;
- participation in the development of new automatic production technologies and their implementation, evaluation of the obtained results;
- participation in the implementation and adjustment of technological processes, tools and systems of automation, control, management, diagnostics in the course of preparation of production of new products, evaluation of their competitive capabilities;
- participation in the development of technical documentation for automation of production and for equipment;
- development and improvement of systems, means of automation, control of production and technological processes of production, its life cycle and quality;
- providing measures for improvement of the quality of products, streamlining of technological, metrological, material basis of its production;
- organization of workplaces, implementation of technological equipment, technological means of automation, management, control, diagnosis and testing;
- provision of measures for revision of the current and development of new regulatory documentation on automation and control of production and technological processes, product life cycle and quality;
- development of modern methods of automation, control, measurement, diagnostics, testing and control of the production process, its life cycle and quality.

Foundry Production

Systems of automated management of technological processes in industry and city infrastructure

Automation is a field of science and technology that is focused on the creation and application of algorithmic, hardware and software systems and means of automation and control of a wide range of technical objects, including industrial enterprises (non-ferrous and ferrous metallurgy, power plants, food industry, etc.) and urban infrastructure (construction, lighting, electric and heat networks, gas facilities, transport, etc.). The knowledge gained allows the graduates of the programme to develop and operate automatic and automated control systems, design software, databases, information and industrial networks.

Thus, this is a programme that today covers all the spheres of human activity, because technology is ubiquitous, and automation helps control it without human intervention. In the English-speaking

world, this type of activity is known as Automation and Control, or System and Control Engineering, and such specialists are among the most popular ones.

The educational process is carried out in world-class laboratories equipped with the up-to-date technology and software, and the level of training of the graduates helps them quickly adapt to the conditions of specific industries and technological processes.

Metal Treatment under Pressure