Metallurgy

South Ural State University

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

Language of study: **Russian**
Mode of study: **full-time, part-time**
Duration: **4 years – full time, 5 years – part time years**
Availability of free education: **no**
Price: **151 800 rubles – full time, 46 400 rubles – part time**

Programme webpage at the university website:
https://www.susu.ru/en/education/bachelors-specialist-degree-programs/metallurgy-field-metal-science-and-thermal-treatment

Programme curator: **Yury Koriagin**
Tel.: **(351) 272-34-24**
E-mail: koriaginyd@susu.ru

Metallurgy is the basis of economics of all developed countries of the world. In turn, the foundry is the main procuring basis of engineering industries (automobile and tractor construction, aircraft motor industry, agricultural machine construction, shipbuilding, machine tools, energy and chemical engineering, military equipment, building machinery, metallurgical and mining equipment and so on) and its development depends on the rate of growth of machine-building industry of the country as a whole).

Specializations within this programme

Ferrous and Non-Ferrous Foundry

Metallurgy

Steel is the most wide-spread constructional material in the world. Cast-iron and steel products are the foundation of mechanical engineering, power engineering, construction, piping industry, etc. Russia is in the Top 5 major steel manufacturers. The enterprises of the South Ural region play a significant part in it.

The "Metallurgy" educational programme aims at training the future holders a Bachelor's degree, who will be competitive in the regional, federal and international labour markets in the field of modern metallurgy. Using the up-to-date educational technologies, the Faculty's academic staff forms the students' knowledge on obtaining ferrous and non-ferrous metals, and manufacturing metals by foundry processes and treatment under pressure.

In the 21st century, in the context of the challenges of the new times, metallurgy is undergoing intensive transformations: digital technologies are being implemented, the ecological burden is decreasing (emissions are being reduced), and the work performance is growing (wages are increasing).

Pyrometallurgical Processes

Metallurgy (Pyrometallurgical and Foundry Technologies)

This programme aims at training qualified specialists in the field of modern metallurgical production, who are capable of solving project-and-technology and production-and-technology tasks in accordance with the professional standards. The programme focuses on forming the theoretical and technological base of the processes of producing ferrous metals and alloys, and high-quality casting. Bachelor's degree students take internship at metallurgical and

mechanical-engineering enterprises in our region.

Metal Technology and Thermal Processing of Metal

Metallurgy (Metal Science and Thermal Treatment of Metals)

SUSU’s students are trained to work in the field of production and processing ferrous and nonferrous metals.

As graduates they can undertake research, production and technology and project-based activities. The department of Materials Science and Physicochemistry of Materials is equipped with modern equipment for laboratory and research work as well as final bachelor's work: optical and electron microscopes, test equipment (tensile machines, impact machines, hardness testers), instruments and machines for determining physical properties, equipment for obtaining new materials and their processing.

The focus of theses written by metal scientists is research, production and technology. The data used for theses is often taken in the course of internship (internal and at an enterprise/plant).

Our graduates, thanks to their thorough scientific and practical training at the university, are in high demand in both large and relatively small enterprises; due to the expanding range of metallurgical and machine-building products, including the military-industrial complex, metal scientists are needed at all stages of production.

Main employers: Mechel, Chelyabinsk Electrometallurgical Integrated Plant (ChEMK), ChelPipe, Trubodetal, Chelyabinsk Zinc Plant, Chelyabinsk Tractor Plant, Chelyabinsk Forge-and-Press Plant, Makeyev Rocket Design Bureau, Chelyabinsk automatic-mechanical plant, RosNITI, plants in Chelyabinsk Oblast: in Yuzhnouralsk, Chebarkul and etc.

Further study opportunities: master’s program Metal Science and Thermal Treatment of Metals (full time and part time). Usually masters combine their training with internship or work in enterprises. Their master’s degree thesis is connected to the field of activity of the enterprise in which they work.

After graduation masters can continue their studies and enroll into a postgraduate course.

Materials science, corrosion and protection of metals, solid state physics, ferrous metallurgy, nonferrous metallurgy, thermal treatment of metals, mechanical properties of metals, physical fundamentals of strength, physical properties of metals, thermal equipment, automation of heating processes, computer design of thermal treatment processes, diffusion surface saturation, theory of thermal treatment, high-speed methods of heating in thermal treatment, non-equilibrium crystallization, extractive metallurgy in relation to multi-component systems, methods for monitoring and analysis of materials.

Metal Working Process