Mathematics and Mechanics

South Ural State University

Degree or qualification is awarded: **Postgraduate studies**

Language of study: **Russian**
Mode of study: **full-time**
Duration: **3 years**
Availability of free education: **no**
Price: **161 800 rubles**

Programme webpage at the university website:
https://www.susu.ru/en/education/phd-degree-programs/010601-mathematics-and-mechanics-applied-mechanics-dynamics-and

Programme curator: **Georgii Sviridiuk**
Tel.: **+7(351)267-91-15**
E-mail: pmfdek@susu.ru

The graduates are trained for conducting research activity in the field of fundamental and applied mathematics, mechanics, natural sciences in scientific-and-production sphere, in social-and-economic sphere, as well as for teaching mathematical disciplines in educational organisations of higher education.

Specializations within this programme

Mathematics and Mechanics (Differential Equations, Dynamic Systems and Optimal Control)

The graduates are trained for conducting research activity in the field of fundamental and applied mathematics, mechanics, natural sciences in scientific-and-production sphere, in social-and-economic sphere, as well as for teaching mathematical disciplines in educational organisations of higher education.

Mathematics and Mechanics (Mathematical Modeling, Numerical Methods and Software Complexes)

This educational programme is focused on training researchers ready to use mathematical modelling, numerical methods and software complexes for solving scientific and engineering, fundamental and applied problems. The professional activity of the graduates, who have mastered this postgraduate programme, includes the development of new mathematical models of objects and phenomena, development of the analytical methods of mathematical models studying, development of efficient computing algorithms and implementing them using modern computer technologies.

Mathematics and Mechanics (Fluid and Plasma Mechanics)

Fluid and Plasma Mechanics is a field of natural sciences, which based on the ideas and approaches of the kinetic theory and continuum mechanics, studies the processes and phenomena, which accompany the flow of homogeneous and multiphase mediums during exposure to mechanical, heat, electromagnetic and other actions, as well as those which happen during the interaction of fluid mediums with moving or static bodies.

The field of professional activity of the graduates, who have mastered this postgraduate programme, includes building and studying of mathematical models for describing the parameters of the flows of moving mediums in a wide range

of conditions; conducting experimental research on the flows and their interaction with bodies, with the interpretation of the experimental data in order to predict and control natural phenomena and technological processes, which include the movement of fluid mediums.

Mathematics and Mechanics (Applied Mechanics, Dynamics and Strength of Machines)

The dynamics and strength of machines, tools and equipment is the field of science and technology that studies the behaviour of technical objects for various purposes, the laws of mechanical (and related thermal, hydraulic, etc.) phenomena in structures and materials using the methods of mechanics and computational mathematics.

The study of dynamic processes, stress state and strength of machines, tools and equipment is carried out in order to:

- create new generations of machines, tools, equipment, technologies and materials with qualitatively new functional properties;
- improve the existing structures and technologies with increasing operational characteristics, reducing material and energy intensity;
- ensure the reliability and safety of structures at all stages of the life cycle, from design to the solution of the issue of decommissioning or extending the service life.