

Review paper

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Mission of Samara State Transport University

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ABSTRACT Samara State Transport University (SamGUPS) is the largest transport university in the Volga Federal District, training specialists for the country's railway transport and for many other areas of the national economy.

The institution was founded in 1973 as the Kuibyshev Institute of Railway Transport Engineers, primarily to meet the need for highly qualified engineering staff of the Kuibyshev Railway, one of the largest railway enterprises of the USSR.

In 1991, in connection with the renaming of the city of Kuibyshev and the return of its historical name Samara, the university was renamed Samara Institute of Railway Transport Engineers (SamIIT).

Over the past period the higher education institution has consistently raised its academic status – first to the Academy, becoming Samara State Transport Academy, and in 2007 – winning the right to be called Samara State Transport University.

The article presents the main goals and objectives of the university and the achieved results of the university development, tells about the interaction of Samara State University of Railway Transport with related branch and engineering universities in our country and abroad, tells about the interaction with transport, construction and infrastructure enterprises in the cities of the region.

KEYWORDS: universities; railway transport; engineering transport education; import substitution

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Обзорная статья

Миссия Самарского государственного университета путей сообщения

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АННОТАЦИЯ Самарский государственный университет путей сообщения (СамГУПС) – крупнейший транспортный вуз в Приволжском федеральном округе, ведет подготовку специалистов для железнодорожного транспорта страны и для многих других областей народного хозяйства.

Учебное заведение было основано в 1973 г. как Куйбышевский институт инженеров железнодорожного транспорта, прежде всего, для удовлетворения потребности в высококвалифицированных инженерных кадрах Куйбышевской железной дороги – одного из крупнейших железнодорожных предприятий СССР.

В 1991 г. в связи с переименованием города Куйбышева – возвращением ему исторического названия Самара, вуз стал именоваться Самарский институт инженеров железнодорожного транспорта (СамИИТ).

За прошедший период высшее учебное заведение последовательно повышало свой академический статус – вначале до академии, став Самарской государственной академией путей сообщения, а в 2007 г. – завоевав право называться Самарским государственным университетом путей сообщения.

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Представлены основные цели, задачи университета и достигнутые результаты развития вуза, показано взаимодействие САМГУПС с родственными отраслевыми и инженерными университетами в стране и за рубежом, предприятиями транспорта, строительства.

КЛЮЧЕВЫЕ СЛОВА: университеты; железнодорожный транспорт; инженерное транспортное образование; импортозамещение

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SamGUPS is one of the largest transport universities in Russia, and its graduates are in demand not only in the territories where its branches are located, but also beyond their borders.

Highly qualified specialists are the main resource of modern railways. The mission of SamGUPS is to train highly qualified personnel with an active civil position, devoted to the interests of the Fatherland and possessing competences that allow successfully solving the problems of operation of existing transport systems, their development, creation of new ones on the basis of expanding the boundaries of scientific research and integration of the latest developments in the world transport system.

SamGUPS is a member of the consortium of scientific and educational centre (SEC) of Samara Region. Consolidating joint efforts with strategic partners and other higher education institutions participating in the SEC, the university is actively involved in creating technological innovations and in training new teams capable of using the developments in real production.

The goal of the university's scientific sector is to obtain new technologies and products with subsequent commercialisation.

To solve major scientific and technological problems in the interests of the development of science and economy sectors in accordance with the priorities of scientific and technological development of the Russian Federation, SamGUPS carries out large-scale work on the development of resource-saving technologies, VR-technologies, technologies related to improving the efficiency of railway infrastructure facilities, train safety and passenger complex. Activities on the development of technical solutions include the application of process automation and intelligent systems.

The University successfully cooperates with the country's leading universities — Far Eastern State University of Railway Engineering, National Research Technological University (NITU) MISiS, Samara National Research University named after Academician S.P. Korolev and Russian University of Transport (RUT (MIIT)) in the implementation of joint educational programmes, using effective teaching tools, methodological and technological resources.

In the 2023–2024 academic year, 50 first-year students of SamGUPS speciality “Railway Rolling Stock”

started studying the discipline “Computer Studies” at the Far Eastern State Transport University in the format of network interaction. And students of the Far Eastern State Transport University started studying the discipline “General Course of Railways” on the basis of SamGUPS.

Interaction between the universities takes place in a distance format using the technical and human resources of both parties.

For the second year in a row, SamGUPS cooperates with the National Research Technological University “MISIS” (Institute of Steel and Alloys) in the study of the discipline “Chemistry” on the basis of an agreement on the network form of implementation of educational programmes.

MISIS educational resources are available on the Open Education platform. This year about 800 1st and 2nd year full-time and part-time students started studying chemistry.

In addition, SamGUPS students joined the Priority 2030 project as part of co-operation with Samara University. Under the federal project “Development of IT industry personnel potential”, 25 best students of SamGUPS receive additional education in the educational programmes “Data analysis”, “Web layout”, “IT project management”, “Frontend-technologies” and “Development and maintenance of solutions on the 1C-Enterprise platform”.

To develop scientific thought and attract students to innovative research, the university organises various scientific events: strategic sessions, conferences, open lectures and scientific and technical exhibitions to demonstrate scientific achievements and developments of the university. At such events our scientists are given the opportunity to actively participate in the creation of new trends and directions of science development at the university.

Young scientists of SamGUPS are actively involved in grant activities, annually become winners of prestigious competitions: “Young Scientist of Samara Region”, “Designer of Samara Region”, “UMNIK”, “Start”, “Gubernian grants in the field of science and technology”. The effective participation of the university scientists speaks about the relevance of research topics and significant contribution to scientific activity in accordance with the priorities of development of the region and the country.

The results of interaction with industrial partners, support of scientists, creation of conditions for science development and contribution to the economy become one of the key performance indicators of the university, along with scientific articles and high performance of scientists.

Another promising direction of scientific and educational activity is the application of distance learning technologies in the university in the organisation of the educational process. One of such technologies is the e-learning system, which provides support of the educational process by means of e-learning, allows organising effective synchronous and asynchronous interaction between the participants of the educational process. Several types of e-learning courses are implemented in the e-learning environment: discipline/practice courses (in which the teacher can independently add forums, chats, meetings to coordinate all stages of the educational process, there is also an opportunity to add to the e-course elements that allow collecting, checking and storing reporting and other documentation), system courses and author's courses. It was on this site that training sessions and scientific research of students during the pandemic were conducted. In the e-learning system it is possible to include a version adapted for people with disabilities.

Consultations of scientific supervisors and teachers for students can be conducted online both individually and for a group on any of the videoconferencing platforms presented in the electronic information and education environment (EIEE) of SamGUPS: BigBlueButton, Jitsi, and Yandex.Telebridge.

To make it easier for students to navigate and work comfortably with the SamGUPS EIEE resources, the discipline "Digital Technologies for Self-Education" was introduced in all implemented educational programmes of higher education.

In 2023, the university opened an automated digital video studio "Jalinga", designed to create high-quality video content by just one person, at the expense of the university's industrial partner "Russian Railways", JSC. Jalinga is an innovative Russian-made tool designed to capture high-quality educational materials and videos, making them interactive through the use of a touch screen board.

The main technical solution of Jalinga is a transparent sensor board, a programme for creating video presentations, and all the elements of a modern video studio (cameras, lights, monitors, special wall and floor coverings, etc.). The system is capable of recording simple speeches of speakers and creating full-fledged video lessons, as well as working in the format of online conferences with integration in social networks and other platforms.

Teachers can independently create training and presentation videos on their subject or speciality, and

conduct webinars with students in a new format. At the same time, they can use the full functionality of the studio — WOW-interactive, advanced software and equipment, and their own presentation editor.

Ready-made training videos in innovative format are posted in the university's EIEE, social networks, and on various interactive educational platforms.

SamGUPS currently implements training according to individual study plans both full-time and part-time. In order to realise an individual approach to education, the university, within the framework of the admission campaign of the 2022/23 academic year, offered for SVE graduates to obtain a higher education degree with a reduction in the period of study while continuing their studies in the previously chosen specialty. And this reduction is significant: from 1.5 to 2 years depending on the chosen educational programme and previously mastered disciplines. Thus, a graduate of a technical school can receive both secondary vocational and higher education in 7 years (starting from the moment of enrolment in vocational education programmes, i.e. after the 9th grade.

In the process of study, students have the opportunity to receive additional education on a wide range of educational programmes ranging from working professions to professional retraining with the receipt of relevant documents on education and qualification.

The University, being a sectoral higher education institution, has always had the closest ties with future employers of graduates. Of course, the most important and largest of them is "Russian Railways", JSC, which currently has more than 800 thousand employees. "Russian Railways", JSC provides places for internship and practical training for students, which allow them to acquire not only knowledge, but also to hone their skills in a real industrial environment. The University is open for co-operation with other representatives of both the transport industry and employers in the fields of economics, finance, management, personnel management, IT-technologies, and power engineering.

In the course of training, each bachelor's student undergoes at least 4 different internships, and in speciality programmes their number is even higher — at least 7. SamGUPS educational programmes allocate from 700 to 1000 hours for internships, and the university strives to increase their number. The educational programmes have already reflected the changes in legislation regarding the introduction of practical training: the university has signed more than 70 agreements on practical training with relevant organisations in 10 regions of the Russian Federation.

SamGUPS graduates have the opportunity to take part in the diploma project competition, which is held annually by "Russian Railways", JSC.

In 2022, the university took part in the federal project "Professionalism", which included the purchase of



In SamGUPS locomotive driver's simulator class.
Photo by SamGUPS

new teaching and laboratory equipment. This equipment is used both in the educational process under vocational and higher education programmes, as well as for advanced training of railway transport employees.

In addition, within the framework of cooperation with Russian Railways, three new computerised simulators have been added to the university over the last three years: "Railway Station Sorting Hill", "Simulation Simulator for the Train Operator/Train Dispatcher on Duty at the Sorting Hill", and "Train Driver Simulator".

The programme of interaction between "Russian Railways", JSC and university complexes of railway transport, which runs until 2025, has become an important step towards the development of the industry education system in terms of training personnel for the industry.

Main characteristics of the educational segment of the industry's personnel supply:

- reliability, sustainability and efficiency of public-private partnership of transport universities, institutes and academies with the real sector of economy, primarily with large transport business, Federal Railway Transport Agency and Ministry of Transport of the Russian Federation in order to implement the Transport Strategy of Russia in the educational and scientific spheres;
- integrity, dynamics and efficiency of activity, availability of a large potential for development of the system of educational institutions of higher education, subordinated to Federal Railway Transport Agency, providing quality training of the main number of young specialists with higher and vocational education, a significant volume of programmes of additional professional education;
- availability of effective mechanisms for reliable personnel support of the Transport Strategy of the Russian Federation, absence of a general deficit of qualified specialists in the main professional qualification groups of railway transport employees;

- the leading role in staffing of educational organisations providing training for young specialists, skilled workers, additional vocational education, as well as training centres providing vocational training and advanced training, including corporate centres for professional qualifications;
- efficiency of creation and development of universities as unified complexes combining the implementation of secondary, higher and additional education programmes with general education units and territorial branches, which allows to provide continuous education from schoolchildren to doctoral students in conditions of rational proximity to the objects of transport activity;
- uniqueness in terms of scale and efficiency, which has been fully justifying itself for a number of decades and has always been highly appreciated by the country's leadership, of the system of targeted admission and training, which ensures guaranteed reproduction of qualified personnel for all regions of transport activity;
- high employment rate of graduates directly after graduation in the transport industry, which is almost 100 % for students of targeted training, characterising both the compliance of training areas and volumes with the requirements of the industry business and the high interest of young people to work in transport;
- high level of fundamental, professional and practical training of young specialists in general, wide coverage of the student contingent by industrial practice;
- positive dynamics of the educational organisation's development aimed at achieving a high level of practical competences of students, development of practice-oriented researches, wide integration of their results into the educational process, development of innovative activity in cooperation with business;
- orientation to multilevel training of bachelors, specialists and masters in a range of areas beyond the training of engineering and operating personnel, providing a combination of unified methodological approaches to work in the conditions of a unified transport network and the necessary transport specialisation.

At the same time, there are a number of external conditions necessary for the further development of personnel provision, including legislative support for the development of personnel training, improvement of state and corporate support measures for railway universities.

The analysis of the strengths and weaknesses, risks and opportunities inherent in the existing system of personnel training for railway transport shows that, despite the presence of a large number of potential threats, there are real opportunities to neutralise them. The weaknesses are not of an intra-system nature and

can be corrected through comprehensive measures to modernise and improve the quality of the existing educational system.

The fundamental requirements to the quality of transport industry specialists' training are specific and are conditioned by the technological conditions of the transport process implementation as a complex of systemically interrelated technologies.

These include:

- combination of fundamental engineering training with practical skills (from obtaining a working profession to mastering technologies actually used in transport), which dictates, among other things, the need to retain the 5-year engineering training programme within the framework of a specialist degree;
- necessity of inter-level coordination of the content of SVE and HE curricula due to unified technologies;
- need to train and concentrate narrowly disciplined teaching staff at HEIs;
- need for expensive training and laboratory equipment, operating models used exclusively in certain sectoral services;
- bringing training places closer to the places where transport companies operate, including to ensure the possibility of conducting practical classes and using real equipment and techniques for training;
- conducting classes and practical training at enterprises, participation in the training of current industry professionals;
- retention of graduates at line enterprises;
- maintaining special requirements for students due to the need to ensure the safety of the transport process and its technologies in terms of health status.

These conditions can only be fulfilled if the existing system of railway education at universities, which provides profile specialisation and a full course of study under SVE and HE programmes, is preserved.

For example, with the support of “Russian Railways”, JSC, SamGUPS has completely upgraded simulator complexes for the departments that graduate specialists in traffic management. With the introduction of the Russian Railways branded zone, new opportunities have opened up for the introduction of interactive forms of training with master classes on new educational technologies.

“We have an understanding of how to meet the demands of the holding company. We are actively working on the creation of a single effective programme for the development of the university, taking into account the requirements of “Russian Railways”, JSC for the training of specialists in modern realities. For example, we plan to ensure the digital transformation of the university, the effective work of the dissertation council, and the growth of scientometric indicators. Among the strategic objectives is to improve the university’s position in the educational services market,” says M. Garanin, Rector of the university.

The prerequisites for the successful implementation of projects and plans are already in place. For example, in March 2022 SamGUPS won the competition for the right to update the main professional educational programmes with a digital component for professions of the priority industry “Transport Infrastructure” for a number of railway specialties.

As part of the project “Personnel for the Digital Economy”, the university’s scientists adapted digital educational programmes and included modules on cross-cutting digital technologies: artificial intelligence, robotics and sensorics, the Internet of Things, new generation mobile networks, new production technologies, virtual and augmented reality technologies, and quantum communications.

The educational programmes developed under the project have been tested at transport universi-



SamGUPS branded auditorium of JSC Russian Railways. Photo by SamGUPS

ties across the country and are used in the training of transport industry specialists.

Another major event in 2022 was the inauguration of a joint student business incubator (SBI) with Kuibyshev Railway, which has become an integral part of the innovation ecosystem of Russian Railways. For the successful and effective functioning of the SBI, a separate organisational structure was created within the university and a BIM laboratory was opened where students can design any objects in 3D models at the request of Russian Railways.

The business incubator was created as an auxiliary tool for growing technological innovation projects for “Russian Railways”, JSC, and the discipline “Building a Business Model” is included in all educational programmes of the university. The SBI operates on the open innovation model, which makes it possible to attract student ideas and projects, and then, with the support of experts from KbZD and the All-Russian Public Organisation “OPORA ROSSII”, they will be brought to technological readiness demanded by Russian Railways, with the prospect of opening startup companies.

In September 2022, 100 first-year students started classes at the Samara College of Railway Transport of SamGUPS as part of the federal educational programme “Professionalism”. Under this programme, “Russian Railways”, JSC together with SamGUPS organise the training of specialists from secondary vocational schools in relevant railway professions within a shortened period of time. All the conditions have been created to solve this problem and the project is taking on new forms and tasks, relevant, first of all, to the real sector of the economy.

The Samara railway transport education and production cluster (centre) has been established on the university's site, where thematic classes and co-working spaces have been opened, and practical training has been organised at the enterprises of the Kuibyshev Railway. The first graduates will be certified in the form of a demonstration examination in accordance with the corporate standards of “Russian Railways”, JSC. After the training, graduates will have a guaranteed employment opportunity at the railway enterprises of the Kuibyshev Railway.

Today SamGUPS is a scientific, innovative and cultural centre, a leading transport university in the Volga Federal District. The university has organised and actively operates institutes of additional education, professional and corporate competences, where not only students but also railway employees are trained. The main task remains the training of graduate railway engineers for the railway transport of “Russian Railways”, JSC. Entering independent life, the university graduates should be equipped with the latest achievements of science and practice, possess competences corresponding to new challenges and tasks.

INTERNATIONAL ACTIVITY OF THE UNIVERSITY

International activities are a key factor in the integration of Samara State University of Railway Transport into the global educational space through active implementation of innovations in the educational process, conducting breakthrough research, increasing academic, student and faculty mobility.

The number of foreign students from 11 countries receiving higher education at SamGUPS is over 500 people. Internationalisation of educational and research process is among the priority tasks of Samara State University of Railway Transport and is a strategically important vector of the university development.

The effective tools for achieving the set goals are:

- intensive development of student and academic mobility programmes;
- active assistance in international co-operation in solving priority scientific problems;
- effective representation of the university in international regional and global rankings;
- participation in international professional associations and unions.

The main directions of international activities of SamGUPS are integration of the university as an equal partner in the world scientific and educational space, innovation and research environment, formation and maintenance of the image of the university as a world-class educational and research centre, development of international relations.

The University is interested in developing and strengthening the international reputation of the university in educational, scientific and innovative spheres, as well as in interregional cooperation with Russian universities and universities of the CIS countries in order to jointly solve the problems of entering the international educational and scientific community.

The university is developing and implementing joint international educational programmes in the educational process. Comprehensive support is provided for the process of adaptation and education of international students.

With the support of the university administration, favourable conditions are created for the organisation, activation and coordination of international academic mobility programmes for students, undergraduates, postgraduates and teachers.

SamGUPS is actively involved in the formation and implementation of joint international programmes and projects, including international grants.

The Centre for International Relations and Marketing Services at the university organises international exchange and cooperation activities in the field of higher and postgraduate professional education, teaching

and research activities, professional development of specialists.

The university also organises admission, training and internship of foreign citizens in accordance with the state educational standard.

The development of partnership relations with the world's leading universities is one of the priority areas of international co-operation.

Today the University has more than 20 bilateral agreements with universities and research organisations from 10 countries. One of the key foreign partners with whom the most active and fruitful cooperation has been established is Shaanxi Railway Vocational Institute (PRC).

The joint educational project of SamGUPS and Shaanxi Railway Vocational Institute was created to

attract high-quality foreign resources, search for innovative forms in the field of education. Participation of the two countries in the formation of the Eurasian high-speed transport corridor Moscow–Beijing is one of the main points of the agreement, which is based on China's initiative "One Belt, One Road". The implementation of joint educational and research projects on the bases of railway transport universities determines the success of joint solutions of railway companies of the Russian Federation and China for the formation of the Eurasian high-speed transport corridor.

Cooperation between SamGUPS and foreign partner universities is based on mutual understanding, deep respect and awareness of the important task of joint activities for the prosperity of the international commonwealth states.

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