

**DEVELOPMENT PROGRAM**  
**of the “M.K. Ammosov North-Eastern Federal University”**  
**Federal State Autonomous Educational Institution for Higher Education**  
**for 2021-2030**

The 2021-2030 Development Program of the “M.K. Ammosov North-Eastern Federal University” Federal State Autonomous Educational Institution of Higher Education outlines the avenues and priorities of the University’s development in the third decade of the 21<sup>st</sup> century.

The Program aims at solving the tasks envisaged by the National Program for the Socio-Economic Development of the Far East until 2024 and further until 2035 and the “Socio-Economic Development of the Arctic Zone of the Russian Federation” State-run Program. It is coordinated with the instruments of strategic planning of the development of the Far East and the Arctic Zone of the Russian Federation, as well as with the strategies for the socio-economic development of the Sakha Republic (Yakutia), the Magadan Region, the Kamchatka Territory, and the Chukotka Autonomous District.

**Scope of Problems and the Target Model**

The choice of the key strategic trends in the North-Eastern Federal University development is governed by the global natural, climatic, social, economic, and cultural challenges specific to the Far East and the Arctic Zone of Russia:

- severe natural and climatic conditions and an increasing anthropogenic impact;
- the quality-of-life indicators below the national average;
- underinvestigated capacity of the territories, natural and climatic processes, and aspects of human activity in the extreme conditions of the North;
- the growing threat of reduced social responsibility in young people, their separation from the ethnic culture, language, spiritual and ethical values;
- global interest in the natural resources of the macroregion.

In addition to the global challenges, the NEFU faces the following internal constraints and challenges:

- remoteness from the leading scientific, educational, and cultural centers of the country, underdeveloped infrastructure;
- digital gap – insufficient digital skills of students from families with low socio-economic status, from rural areas and northern districts.

The growing diversity and uncertainty in nature and society, increased competition in the higher education market, and rapid evolution of digital technologies encourage us to adjust the University’s strategic benchmarks and develop mechanisms for flexible response to changing environment.

These challenges underlie the **keynotes** of the University’s **development**:

- human-centered approach – to build a comfortable environment to fully enable the students’ and the employees’ potential, improve the quality and accessibility of education, bring about more effective scientific research and innovation;

- social responsibility – the University’s responsibility for its impact on society and nature, taking into account ethical standards and possible social, economic, and environmental consequences of decisions taken;

- integration of education, fundamental science, applied research, and production;

- the concentration of resources to obtain results – aggregate resources in promising areas of development.

**The mission of the NEFU** is to foster a new generation of professionals to achieve the goals and follow the principles of sustainable development; to carry out research, implement innovative solutions and social initiatives ensuring that the national goals are met, and the geostrategic tasks in the Far East and the Arctic Zone of the Russian Federation are accomplished.

**The strategic goal** is to develop the University as the leading scientific, educational, expert, analytical, and cultural center of the Far East and the Arctic Zone of the Russian Federation, providing a high-quality educational process, research and development, contributing to the solution of global issues of humanity.

The NEFU Program is based on the ideas of 17 Sustainable Development Goals proclaimed by the United Nations Organization – sustainable economy, sustainable society, and sustainable nature. The Program is built around the following areas of science and education that are in line with the global research agenda and the priority development avenues of science, technology, and engineering in the Russian Federation, leverage socio-economic development of the Far East and the Arctic Zone of the RF, and resonate with the missions of national projects: economic development and well-being; quality of life; social equity; digital technologies; ecological well-being; sustainable use of natural resources; favorable environment.

Based on the geostrategic location, we identify **two key vectors** of the NEFU **positioning**, which delineate the space for its development in the long term:

*the Arctic vector:* Yakutia – North-East of Russia – Arctic Zone of the Russian Federation – Arctic region;

*the Eastern (Asian) vector:* Yakutia – North-East of Russia – Far East – Asia-Pacific region.

At the same time, the University functions at **five levels of positioning**:

I. *Regional level.* The NEFU is the core of the scientific and educational domain of the Sakha Republic (Yakutia), a consortium of all Yakutia’s educational and scientific organizations, development institutions, and real sector companies: building the intellectual, economic, and innovative capacity of the republic as

outlined in the Strategy of Socio-Economic Development of the Sakha Republics (Yakutia) until 2032 with a target vision until 2050.

*II. Macroregional level.* The NEFU is the largest university in the North-East of Russia, with branches in the Sakha Republic (Yakutia) and the Chukotka Autonomous District. Priority research areas: environmental well-being of the population; climatology and permafrost science; conservation of biodiversity; human health in extreme conditions; green living space for people in the North; technologies and new materials for challenging Northern conditions.

*III. Interregional level.* Following the Strategy for Spatial Development of the Russian Federation until 2025, the NEFU's responsibility zone embraces two major geostrategic macroregions of the country: the Far East and the Arctic Zone of the Russian Federation.

*IV. Federal level.* As per the Concept of Establishing and Providing State Support for the Development of Federal Universities, the NEFU, being a regional development hub, is in charge of building and developing competitive human capital in the federal districts, achieving the national development goals of the Russian Federation until 2030, breakthrough R&D in the areas on the List of Critical Technologies of the Russian Federation. The University will initiate projects for the development of Russia's geostrategic territories.

*IV. Global level.* The NEFU – as an authentic university of the Arctic and the Asia-Pacific regions – will evolve as an international scientific and educational center and an expert, analytical, project, and creativity platform for sustainable development matters, focused on solving the global problems: preserving minority languages and cultural diversity; improving the quality of life and well-being; introducing green nature management technologies; inventing materials and technologies for extreme conditions.

Our movement towards becoming the academic leader of the territory will envisage two stages:

Stage I – 2021-2025 aims to make the University more competitive and consolidate it as a leading scientific, educational, expert-analytical, and cultural center of the Far East and the Arctic Zone of the Russian Federation.

Stage II – 2026-2030 aims to strengthen our position among the Arctic and Asia-Pacific universities in terms of the quality of education, research, and development.

### **Institutional Transformation of the University**

The Program involves an institutional transformation of the NEFU to achieve the strategic goal and implement the University's mission.

This stage of the NEFU development shall be governed, on the one hand, by the need to train competitive personnel capable of developing the significant natural resource potential of the macroregion, updating the transport, energy, and information infrastructure, and building of highly efficient non-resource industries;

on the other hand, by pursuing the strict requirements of sustainable use of natural resources and commitment to the sustainable development goals.

In 2021-2030 the North-Eastern Federal University will be fulfilling its mission as a university that:

- shapes the future vision of the geostrategic territory and Russia as a whole;
- focuses on solving the global problems of humanity;
- explores trends of the macroregion's development;
- creates precedents of new things – thinking, goals, intellectual practices, technologies, and materials;
- builds soft skills and future skills;
- creates an environment fostering self-development and self-actualization of an individual;
- develops technologies and models for improving the quality of life in the North;
- promotes Russia's traditional spiritual and ethical values;
- is open to interaction.

To obtain a synergistic effect and enhance the University's footprint in the macroregion, the NEFU's bases its target development model on the following areas:

- re-scaling the interaction – the Arctic and the Asian vectors of development;
- personalizing and customizing education based on the digital footprint;
- changing the principles of organizing scientific activity;
- building a geographically distributed network structure of the University;
- renewing values of youth policy;
- building a competitive environment within the University;
- exploring new segments of the continuing professional education market;
- building an open, innovative socio-cultural ecosystem;
- developing the campus, creating high-tech scientific and educational clusters.

The University's institutional transformation will involve the introduction of the following set of tools:

- launching academic areas and majors that are crucial for the future-proof development of the Russian Far East and the Arctic;
- focused development of research master's programs;
- intensifying interdisciplinary research, governed by the priorities of research and technology advancement;
- implementing the "U360" model, building an extensive branch network in the Arctic and Asia-Pacific regions;
- lining up project teams in breakthrough areas, introducing a cluster recruitment strategy;

- enhancing international and interregional scientific and educational partnership;
- restructuring of the governance system through the creation of breakthrough teams and making the University more open;
- introducing end-to-end digital technologies and platform solutions;
- providing scientific, analytical, expert, and consulting support for the future-proof development of the Far Eastern Federal District and the Russian Arctic.

### **Strategic Projects**

We will concentrate efforts and resources to implement three Strategic Projects in key areas of the NEFU development, focused on the University's institutional transformation.

#### **Strategic Project #1. The University's Digital Ecosystem**

The Project aims to digitalize the core processes, build students' and employees' digital skills, and introduce data-based practices.

The essence of the Strategic Project is to develop and implement a model of the University integrated into a person's life cycle and focused on their maximum self-fulfillment to ensure that a person is involved in managing the digital educational content.

*Goal:* to transform the University's role as per the digital ecosystem model – adaptive, self-regulating, open for cooperation, integrated into the human life cycle, and focused on their maximum self-fulfillment.

The Strategic Project consists of two interrelated Subprojects.

***“University 360” Subproject*** aims to introduce a hybrid university model based on shaping a lifelong learning ecosystem. As per this model, students articulate their personal educational demand, accommodated by the University's relevant educational offers in the form of lectures, disciplines, and modules supplied by various content providers. Furthermore, the “University 360” multiservice platform – an aggregator of educational products and services – will ensure the interaction between educational content providers and students.

***“North-East” Technopolis Subproject*** is focused on building advanced and future-proof digital skills in the students of engineering, technology, IT, and others majors. The Subproject envisages introducing the NTI and Future Skills markets into the educational process; introducing the practices of CDIO, WorldSkills, and Future Skills standards for all groups of technical and non-IT majors; redesigning the content of educational programs to suit the current objectives and processes of the R&D labs (organization of applied research and R&D); introducing a “Startup as a Curriculum” practice (the University as an accelerator to build the skills required for business development); developing new and future-proof skills, tailoring and offering new programs for training highly qualified research and industrial personnel in the promising areas of the macroregion's industry.

## **Strategic Project #2. Sustainable Technologies to Develop Northern Territories.**

Implementing the Strategic Project will ensure the territorial and sectoral leadership of the NEFU in sustainable nature management and sustainable development of northern ecosystems.

*Goal:* to devise safe and resource-saving technologies for the development of natural resources of the North, Arctic, and Subarctic, based on knowledge and compliance with the core principles of natural configuration of the biosphere.

The Strategic Project includes two Subprojects to ensure efficient human-nature interaction, environmentally safe development and use of vast northern and Arctic spaces, and sustainable and dynamic socio-economic development of the Russian North-East, Arctic, and Subarctic.

***“Sustainable Nature Use and Sustainable Development of Northern Ecosystems” Subproject*** envisages the following:

- safe resource-saving technologies for prospecting and developing natural mineral and biological resources;
- research of the strategic mineral deposits, the evolution of flora and fauna, and behavior of northern ecosystems under the global changes on the Earth (including climate change and anthropogenic impact);
- new technologies of forecasting of major challenges and early warning of threats to the environmental safety of the northern regions; monitoring of environmental status and changes;
- new interdisciplinary educational programs of different levels, aimed at safeguarding and reproducing fragile, vulnerable northern ecosystems.

The key intellectual products will be safe resource-saving technologies for developing natural mineral and biological resources and new knowledge about environmental changes' status and patterns.

***“New Materials and Technologies for Extreme Northern Conditions” Subproject*** envisages activities to respond the global challenges such as energy transformation, the global industry's growing demand for critical materials and technologies, climate change, uncontrolled changes in the permafrost, unconventional energy development, including:

- theoretical and experimental research on materials with improved characteristics to be used in the extreme climatic conditions;
- developing innovative technologies for the North, including renewable energy, smart cities, material engineering, and quantum calculations;
- providing personnel and scientific guidance to develop chemical-engineering facilities for hydrocarbon and biofeedstock processing in the North-East of Russia.

Key products of the Subproject: polymer composites, technical developments, microstructured materials, nanomaterials, graphene, and transition metal

dichalcogenides tailored for the Arctic; updated bachelor's, master's, and postgraduate degree programs in modern materials science and engineering; scientific and innovative infrastructure facilities: a climatic test facility in Tiksi, and two engineering centers.

### **Strategic Project #3. Human in the Extreme Conditions of the North**

The Strategic Project aims to develop the most effective mechanisms for ensuring human well-being and success in the North.

*Goal:* to increase life expectancy and improve the quality of life of the northerners.

The Strategic Project includes three Subprojects.

***“Cultural and Linguistic Diversity in the North” Subproject*** aims to support and develop the contemporary development paradigm of cultural and linguistic diversity in the North, based on a polylogue of cultures, characterized by complex cross-links that form an information and communication network system. The key initiatives of the Subproject:

- breakthrough projects to revitalize and develop minority languages and cultures of the northern peoples;
- multidisciplinary study of the fundamental mechanisms of generation of Russia's identity and cultural potential;
- modeling of socio-humanitarian processes in the North;
- computer processing of the linguistic heritage of the peoples of the North;
- digitalization of the cultural and linguistic heritage of the peoples of the North.

***“High Technologies for Preserving and Strengthening Human Health in the North” Subproject*** envisages a set of activities in two segments:

- educational activities segment (tailoring and launching interdisciplinary academic programs, opening a residency and a master's degree program in the new major of “Medical Microbiology”, training multi-specialty doctors and medical equipment engineers, etc.)

- the segment of breakthrough interdisciplinary research of the hereditary diseases and gene pool of the northern peoples; innovative methods of the DNA diagnostics; new methods of immune therapy of cancer and some infectious diseases based on monoclonal antibodies; multicomponent cancer vaccines based on the oncogene-induced activity of phagocytosing cells; special composite or auxiliary bio-artificial human organs etc.

Key research and technological products of the Subproject:

- new cellular biomedical products;
- new pharmaceutical substances based on natural medicinal materials;
- new medical devices and technologies for automation and robotization of industrial processes will be in demand in medicine, and their commercialization will provide further promising research after the Strategic Project is completed.

***“The Sustainable Economy of Russia’s Geostrategic Territories”***  
**Subproject** aims to build a system of methods and models for the executive authorities to assess the level and quality of life, strategic planning of the socio-economic development of the northern and Arctic regions, launching new continuous professional education programs.

Key products:

- programs and projects for the socio-economic development of the North-Eastern regions of Russia;
- methods and models of long-term planning and optimization of the spatial and sectoral structure of the geostrategic regions’ economy;
- methods and models of information resource and big data management.

### **Expected Outcomes**

The implementation of the Program will allow us to exponentially enhance the key quantitative indicators of the NEFU development, ensuring the academic leadership of the University in the macroregion:

- the share of students with an additional qualification will grow 5.5 times: from 1.4% in 2020 to 7.6% in 2030;
- the share of foreign citizens pursuing higher education will grow 3.5 times: from 3.2% in 2020 to 10% in 2030;
- the number of researchers with articles in Q1 and Q2 scientific publications, indexed in WoS / Scopus international databases, will grow 2.4 times: from 128 in 2020 to 307 in 2030;
- the number of students who have completed continuing education programs will grow 1.8 times: from 9,734 in 2020 to 17,800 in 2030;
- the number of educational organizations of the Far Eastern Federal District that are members of the "North-Eastern University Educational District" Association will grow 2.7 times: from 112 in 2020 to 300 in 2030;
- the rate of R&D under contracts with the real sector companies within budget resources of the Russian Federation entity per one academic staff member will grow 3 times: from RUB 104.5 thousand in 2020 up to RUB 309.6 thousand in 2030;
- the share of employees under the age of 39 in the total number of faculty members will grow 1.3 times: from 26.5% in 2020 to 35.7% in 2030;
- the rate of income from intellectual products per one faculty member will reach RUB 9.31 thousand in 2030;
- revenues from income-generating activities per one faculty member will grow 1.6 times: from RUB 409.17 thousand in 2010 and RUB 845.412 thousand in 2020 up to RUB 1,361.866 thousand in 2030.

### **The NEFU Competitive Advantages for the Program Implementation**

The NEFU is the largest university in the North-East of the country and one of the leading universities in the Russian Federation.

Positioning in the nation-wide and global scientific and educational space in the medium term and achievement of strategic goals and benchmarks of the Development Program depend on the NEFU's key competitive advantages:

*a) location at the intersection of two priority vectors of Russia's development – Arctic and Asian – defines the variety of possible directions and opportunities for the NEFU positioning:*

- over 50% of the basic academic programs are Arctic-oriented;
- more than 60% of students pursue Arctic-oriented basic academic programs;
- the NEFU is the only university in Russia that trains professionals for the entire diamond pipeline segment;
- the NEFU is the only higher educational institution of the Russian Ministry of Education and Science in the Far East that trains doctors;
- the NEFU is one of the leading centers in the Far East and Russia for training IT and digital economy professionals; 17.6% of offered basic educational programs focus on the digital economy and ICT;
- the NEFU is one of the centers for strategic planning of the socio-economic development of the Far East: over the past five years, we have developed 27 programs for the socio-economic development of regions, municipal districts, economic sectors, and enterprises of the Far Eastern Federal District;
- a wide network of partnerships with leading Russian and international scientific and educational centers, federal and regional authorities, development institutions, and industrial partners: cooperation agreements with more than 500 scientific and educational organizations, 744 real-sector companies, and 145 overseas organizations;

*b) the expert community recognizes the NEFU's contribution to the achievement of the sustainable development goals:*

- 18<sup>th</sup> position in Russia as per THE University Impact Rankings;
- 32<sup>nd</sup> position in Russia as per UI GreenMetric rating, assessing universities' contribution in achieving sustainable development goals;
- the NEFU is the initiator and one of the organizers of the Northern Sustainable Development Forum;
- the NEFU is the initiator and the key venue of UNESCO international conferences on preserving linguistic and cultural diversity in cyberspace;
- the Arctic Council has supported the project for digitalization of linguistic and cultural heritage of indigenous peoples of the Arctic;
- an Arctic Multilingual Portal [www.arctic-megapedia.ru](http://www.arctic-megapedia.ru) has been launched;
- as part of the Program of Multidisciplinary Scientific Research in the Sakha Republic (Yakutia) in 2016-2020, the NEFU has implemented over 50 projects to solve sustainable development issues in Yakutia.

The implementation of the Program will strengthen the current standing of the NEFU in the country and the macroregion due to consolidation of its leading positions in the Far East and the Arctic Zone of the Russian Federation and initiation of large-scale cooperative scientific and educational projects. As a result, by 2030, the NEFU will have strengthened its position among universities of the Arctic and Asia-Pacific regions in terms of the quality of education, research, and development.