Kazan National Research Technological University

www.kstu.ru/knrtu

OUR HISTORY

1890 — Kazan Industrial College

1919 — Kazan Polytechnic Institute

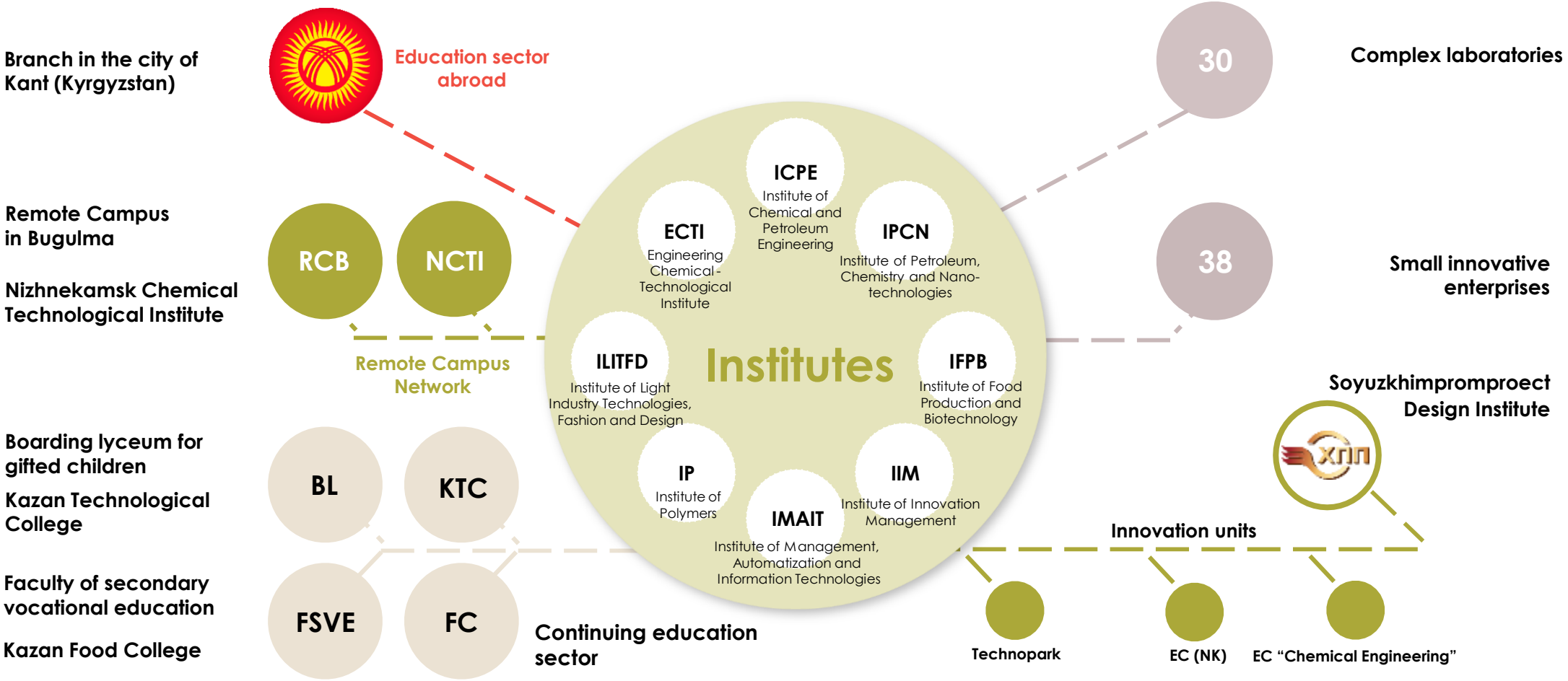
1930 — Kazan Institute of Chemical Technology

1992 — Kazan State Technological University

2010 — Kazan National Research Technological University

2021-22 — Priority 2030 Advanced Engineering Schools (AES)

The Structure of KNRTU



KNRTU in Rankings

ИНТЕРФАКС
INTERFAX

№1

In Chemical Engineering
among Russian universities

33

in the overall ranking
(2022 r.)

QS UNIVERSITY RANKINGS

THE WORLD UNIVERSITY RANKINGS

1000+

In the rankings list of the World's Best Universities

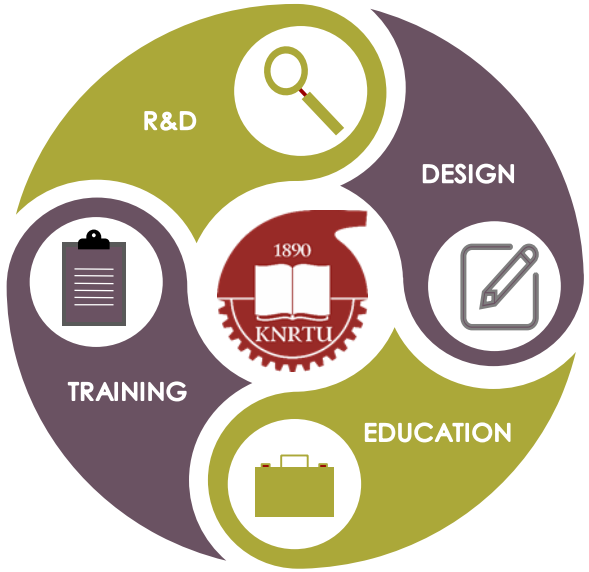
401+

In the world ranking of Quality of Education

301+

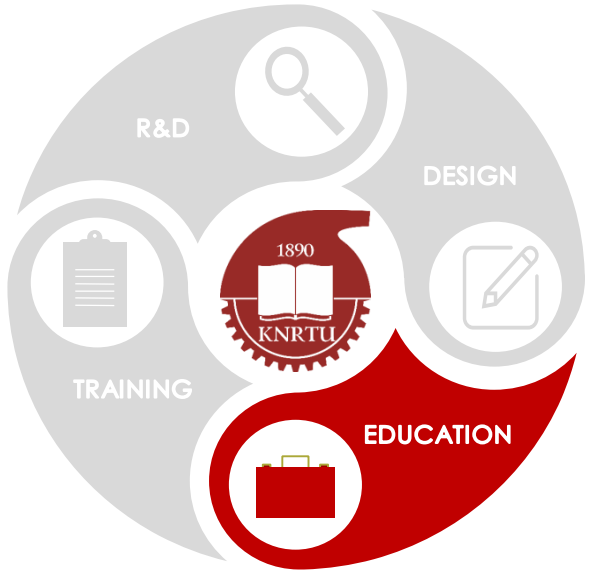
In the world ranking of Industrialization and Innovations

KNRTU Key Industrial Partners



FULL CYCLE UNIVERSITY

Education



FULL CYCLE UNIVERSITY

KNRTU Today

21,000

students

~800

PhDs

>200

professors and doctors of sciences

Main Educational Programs

14
Dissertation Councils

17
Secondary vocational education programs

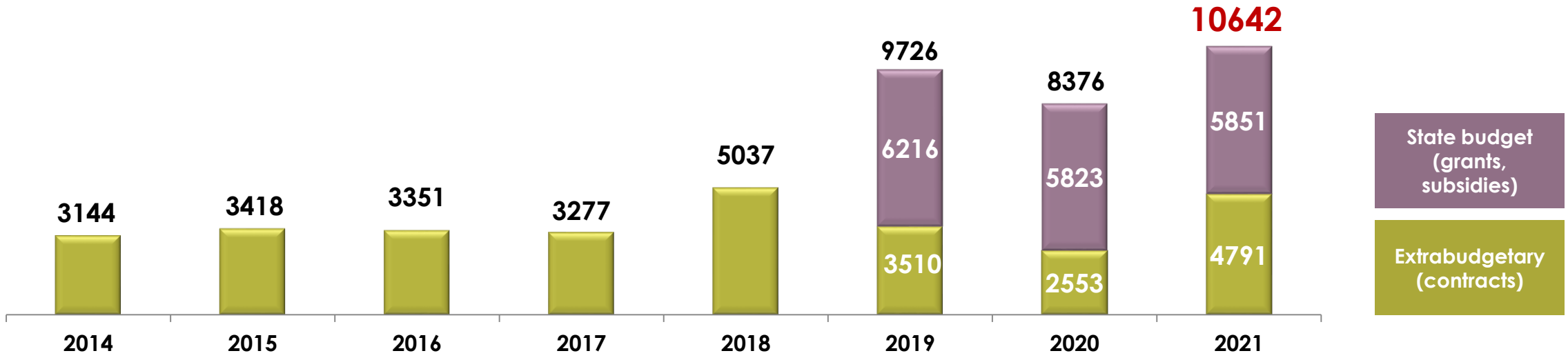
37
PhD programs

120
Bachelor's degree programs

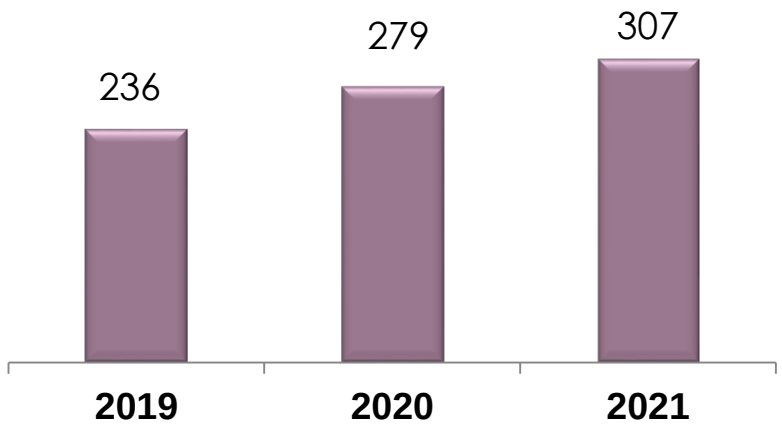
150
Master's degree programs

INSTITUTE OF ADDITIONAL VOCATIONAL EDUCATION OF KNRTU

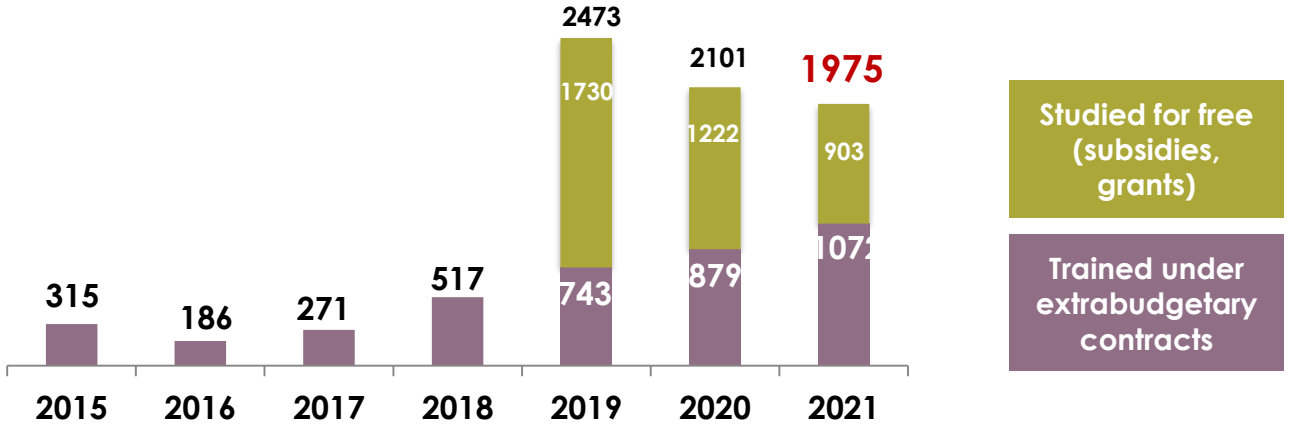
Total number of trainees under the programs of additional vocational education (people)



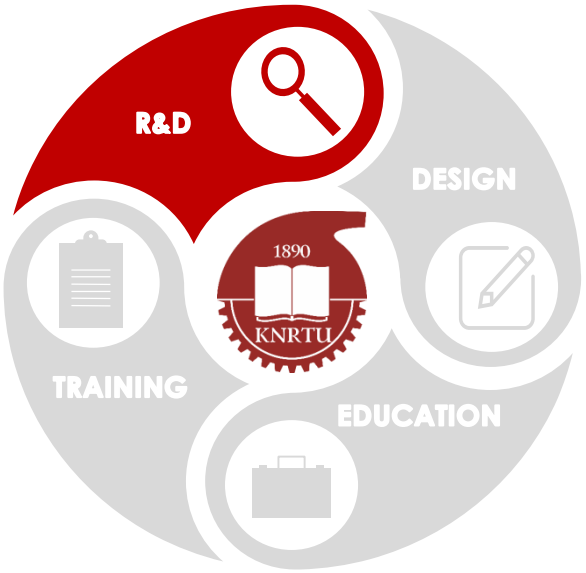
Number of organizations studying the programs of additional vocational education of KNRTU (people)



Trainees of PJSC Gazprom under the programs of KNRTU's additional vocational education



Science



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Science at KNRTU - University Research Development Priorities

CHEMISTRY AND TECHNOLOGY OF ADVANCED MATERIALS

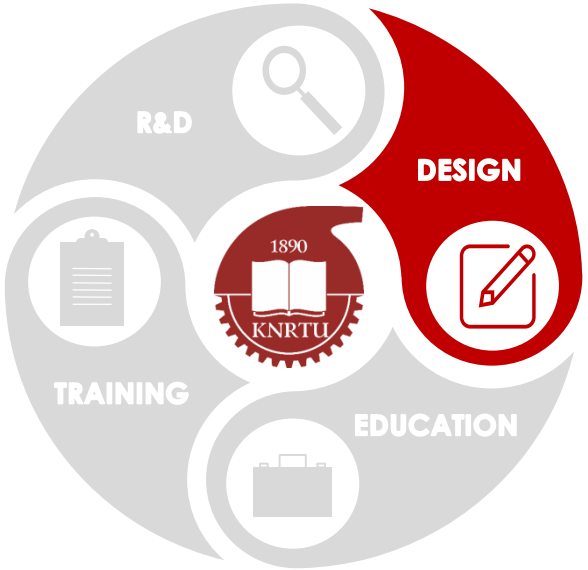
- Chemistry of promising polymers and rubbers; technologies of polymers processing, elastomers and composites; chemistry and technology of plant polymers; recycling technologies; supramolecular chemistry and smart materials.
- Membranes and membrane technologies.
- Synthesis and research of ultrafine inorganic and organic materials, composites, catalysts, ceramic and silicate materials, nanomaterials and coatings properties.
- Protection of materials from corrosion and aging, prediction of the properties of new materials and control of chemical processes: theory and computer modeling.

CHEMICAL ENGINEERING

NEW ENERGY AND RESOURCE SAVING ECOSAFE TECHNOLOGIES, "GREEN CHEMISTRY"

HIGH-PERFOMANCE ENERGY-INTENSIVE MATERIALS, ARTICLES AND INNOVATIVE TECHNOLOGIES OF THEIR PRODUCTION

ENGINEERING



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KNRTU PETROCHEMICAL ENGINEERING CENTRE

Goal: Development of scientific and technical cooperation with scientific, educational institutions and petrochemical enterprises.

Priority Trends of Activity

Chemistry, petrochemistry, petroleum refining	Chemical Engineering	Rubber, caoutchoucs and polymer composite material	Catalysts and sorbent agents	Environmental Engineering

Types of Services

Engineering Advisory Services

- Complex survey of industrial enterprises
- Preliminary Project Work
- Engineering and Calculations
- Value Engineering, HAZOP

Scientific and Technical Services

- Chemical and physical-chemical analysis, physical-mechanical examination
- Scientific and Technical Articles Production
- Development of Program Software Complex

Educational Services

- Development and implementation of professional development programs
- Development and implementation of professional retraining programs

Research and Development Services

- R&D Project Management
- Marketing and patent research
- Technology Upscaling

SOYUZKHIMPROMPROECT DESIGN INSTITUTE

Key Functions:

Expert appraisal of industrial safety of hazardous production facilities

Development of project design documentation

Functions of the general designer

Personnel: 530 qualified specialists with state-of-the-art design methods

Experience of the SOYUZKHIMPROMPROEKT design institute of design and survey works for the last 3 years

№	Manufacturing facility	Agreement Title
1	PLSC «Nizhnekamskneftekhim»	Production of styrene-butadiene synthetic rubber solution with a production volume of 60 thousand tons per year
2	JSC «Voronejsisntezkauchuk»	Construction of a new solvent distillation plant and a wet solvent settling unit
3	LLC «SUBUR-Kstovo»	Reconstruction of benzene extraction plant with implementation of the extractive distillation unit
4	JSC «SIBUR-Neftekhim»	Technical re-equipment of the draining and filling overpass of the liquid petroleum hydrocarbons pyrolysis products of the commodity-feedstock plant and of the off-plot facilities of LLC SIBUR-Kstovo
5	LLC «SIBUR PoliLab»	Centre of Polyolefins Synthesis
6	LLC «ZapSibNeftekhim»	Propane dehydrogenation production volume increase up to 561 thousand tons of propylene per year
7	PJSC «Nizhnekamskneftekhim»	Technical re-equipment of halobutyl rubber production plant up to 200 thousand tons per year
8	JSC «SINUR-Khimprom»	Conversion of the aldehyde production plant from oxosynthesis method to an Rh-catalyst with a power increase by 2-ED and 2-EDC.
9	Daelim Industrial Co. Ltd	Methanol production plant in Kingisepp
10	PJSC «Ruskhim Gas»	Gas-Chemical complex in Nenets Autonomous Area

New Technologies and Materials Consortium

The aim of the consortium is to consolidate the scientific and technical potential of the participants and to organize networking to optimize the use of intellectual and informational resources and infrastructure, which is aimed at participation in interdisciplinary research projects in priority and promising areas of fundamental and applied science for innovative development of the chemical complex.

Consortium Objectives:

- Integration of training, scientific, scientific-manufacturing and innovation activities through the use of the available results of scientific activity in the process of training, research work and the establishment of close ties between the participants, as well as partner organizations of the participants;
- Creation of a unified information environment in educational and scientific activities, laboratories and experimental base for training specialists, including the creation of laboratories and basic departments at enterprises;
- Creation of a unified system of training, retraining and advanced training;
- Raising financial and immaterial resources for educational and scientific activities, carrying out fundamental scientific researches and developments;
- Establishing interaction with the executive authorities of the constituent entities of the Russian Federation and industry, developing interdisciplinary ties, developing recommendations for solving socio-economic, technical and technological problems of the chemical complex and related industries;
- Development of international relations in order to establish academic exchanges and to carry out joint innovative projects;
- Protection of intellectual property rights and commercialization of Intellectual Property Results (IPR).

Center for Industrial and Environmental Safety

Based on Scientific and Educational Consortium of Universities

KNRTU KSUAE KSPEU

Activity Areas

High and Additional Education

- Industry-specific training in the areas
- Training of specialists for supervisory authorities in the field of industrial and electrical safety

Educational and Certification Center

- Full-time study
- Part-time study
- Webinars
- Practical Trainings

Technical and Technological Audit of Enterprises

- Audit of hazardous production facilities
- Expert analysis of design solution
- Consulting of environmental impact analysis

Scientific and Technical Center for Testing and Research

- Control and diagnostic laboratories and centers
- Research and development in the field of industrial and electrical safety

Key Partners

Industrial Complex of the Republic of Tatarstan

The Federal Service for Ecological, Technological and Nuclear Supervision

Federal Service for Supervision of Natural Resources

Federal Academic Leadership Program priority 2030^

leaders are made, not born

The aim: Formation of a group of universities – national leaders in the development of scientific knowledge, territorial and technological development of the economy, creators of the best practices in research, educational and innovative activities

Announcement of the competitive selection

June 2021

191 universities has applied for participation

186 universities have passed formal examination

Meeting of the Commission of the Ministry of Education and Science of the Russian Federation on the approval of recipients of the basic part of the grant

September 2021

106 universities received the basic part of the grant in the amount of 100 million rubles.

54 universities were admitted to the 2nd stage of defense at the Council

Meeting of the Council for the approval of the recipients of the special part of the grant

October 2021

46 universities received a special part of the grant

Leadership in Research Track	Leadership in the Region and/or Industry Track
18 universities (39% are in the regions)	28 universities (75% are in the regions)

1st group –	2nd group–	3rd group –
994 million rubles	**426 million rubles**	**142 million rubles**

KNRTU Development Program in Priority 2030

priority2030^
leaders are made, not born

Policy of Internal Transformation

Strategic Projects

Provision of defense capability and security of Russian economy

The aim: Leading center for defense chemical technology, which specialize in industrial and environmental safety of chemical production.

Development and design of chemical technologies and productions for the new economy

The aim: Leading industry engineering center for the chemical industry and new markets of the National Technology Initiative (NTI).

Frontier research in the branch of new materials, chemical and related technologies

The aim: A leading center of advanced interdisciplinary research for the chemical industry, allied industries, and materials science

Technological Elite

The aim: A unified open platform for identifying, supporting and accompanying talented youth, the development of an ecosystem of youth entrepreneurship

Digital Chemistry

The aim: Development of technological solutions and personnel training for the digital transformation of the petrochemical industry on the principles of Industry 4.0

Projects in progress:

- **EKS CENTER OF INDUSTRIAL SAFETY**
- **EKS CENTER OF MODELING FAST-PROCEEDING PROCESSES AND PARAMETERS PREDICTING DIGITAL POLYGON**

- **ESTABLISHMENT OF THE KRAUSSMAFFEI EDUCATION AND RESEARCH CENTER**
- **ESTABLISHMENT OF THE BRABENDER EDUCATION AND RESEARCH CENTER**

- **CHEMICAL TECHNOLOGIES OF REAGENTS AND FUNCTIONAL FLUIDS FOR HYDRAULIC FRACTURING**
- **ADDITIVE TECHNOLOGY CENTER**
- **BITUMEN MATERIALS CENTER**

- **TECHNOLIDER SCHOOL**
- **ESTABLISHMENT OF DISTANCE EDUCATION**
- **ESTABLISHMENT OF CAREER GUIDANCE PROGRAMME**
- **THE CHIEF DESIGNER SCHOOL**

- **ESTABLISHMENT OF THE "CYBER POLYGON"**
- **SCALABLE MODEL OF A DIGITAL CHEMICAL PLANT**
- **DIGITAL TECHNOLOGY UNIVERSAL PLATFORM (with the application of AI technology)**

Advanced Engineering Schools (AES)

Advanced Engineering Schools

Key Characteristics General engineering task of AES – development of closed-type industrial chemical technology.

Trends:
1) Low-tonnage chemistry (LTC) and petrochemistry
2) Gas refininery and gas transport
3) Mineral Fertilizers

The aim of AES:

- To form a new scientific and educational format for training engineering corps with the use of advanced achievements in the development of chemical technologies and digital transformation to ensure sustainable and advanced development of high-tech companies of the Russian Federation.

AES is involved in solving next problems:

- Transition to digital techniques and practices of research, property prediction, modeling and design of industrial chemical production
- Ensuring the sustainability of process chains dependent on low-tonnage chemical products
- Development of existing and creation of new high-tech chemical companies

Important indicators of AES performance by 2030:

10200 people advanced training and retraining	**2 billion. ₽** AES income from R&D and implementation	**1680** graduates are employed in BT-company	**> 110** graduates are started their own BT-business	**> 80%** Russia - location of low-tonnage chemistry

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