

**Development Strategy of  
National Technical University  
"Kharkiv Polytechnic Institute"  
for 2021 - 2025**

## CONTENT

DEVELOPMENT STRATEGY OF NTU "KhPI" for 2021-2025 .....	4
General characteristics of the university .....	4
The goal and objectives of the strategic plan.....	6
The mission of the university.....	7
The vision of the university .....	8
Strategic guidelines of the university development until 2025 .....	8
In the field of education .....	8
In the field of science .....	9
In the field of Human Resources policy .....	9
In the field of methodological work and education quality assurance .	10
In the field of international activities .....	11
In the field of tangible resources development .....	12
In the field of educational work, popular sports and social protection.	13
In the field of university financing .....	13
In the field of information technology .....	14
ROAD MAP FOR IMPLEMENTATION OF THE STRATEGIC DEVELOPMENT PLAN OF NTU "KhPI" for 2021-2025 .....	15
Plan for the implementation of the development strategy of NTU "KhPI" in the field of education, methodological work and quality assurance of educational activities.....	15
Plan for the implementation activities of NTU "KhPI" development strategy in the field of science.....	21
Plan for the implementation activities of NTU "KhPI" development strategy in the international sphere .....	25
Plan for the strategy implementation in the field of tangible resources development .....	29
Plan for the strategy implementation in the field of educational work, popular sports and social protection .....	31

Plan for the strategy implementation for the Scientific and Technical Library of NTU "KhPI" development.....	38
Plan for the further development of NTU "KhPI" financial strategy .....	43
Plan for NTU "KhPI" personnel strategy implementation .....	45
Plan for the implementation of development strategy of information technology at NTU "KhPI" .....	45
The concept of Academic Council of NTU "KhPI" and the Secretariat of the Academic Council of NTU "KhPI" development.....	48

## **DEVELOPMENT STRATEGY OF NTU "KHPI" for 2021-2025**

### **General characteristics of the university**

Ukraine's competitiveness depends not so much on the capacity of natural resources as on the quality of human resources. The level of education development, the state of human capital, the professional skills of the population decisively form the socio-economic potential of the country. Global practical experience shows that more than 50% of the GDP per capita growth is determined by increased productivity, education, skills and citizens' professionalism. The highest standard of living is achieved by those countries where every second worker has a higher education. In the modern world, the role of higher education as a component of human spiritual life, as the main feature of a society, any community is undeniable. At the same time, the competitiveness of the region is no less determined by the quality of tertiary education.

National Technical University "Kharkiv Polytechnic Institute" is one of the principal universities of the country in the field of engineering education. The university is among the five leading educational institutions in Ukraine. NTU "KhPI" is capable of laying guidelines for sustainable development of national education and science, training modern highly qualified specialists on the basis of equipment and technologies advances in the main sectors of the economy.

#### **Present-day NTU "KhPI":**

- is the leading higher technical institution in Ukraine of the world's leading universities according to the QS World University Rankings 2021, holding the position between 651-700. In the 8 years of its participation in the ranking, the university has never worsened its position compared to the previous year, while the same ratings over the years show that most Ukrainian universities taking part in it failed to maintain their previous positions;

- in the Times Higher Education World University Ranking 2021 (THE WUR 2021) NTU "KhPI" holds the position of "1001+" for the second year in a

row, improving its performance: in the field of Technical Sciences it ranks second among Ukrainian universities, and in the fields of Natural Sciences and Humanities the third;

- NTU "KhPI" is among five top Ukrainian universities according to the ranking of European and Central Asian universities, "QS EECA University Rankings 2021"; in the international Webometrics Ranking of World's Universities; the academic rating "Top-200 Ukraine 2020" and the Center for International Projects "Euroeducation";

- according to the world library ranking of "Transparent Ranking: Institutional Repositories by Google Scholar" in 2020, its repository is among the world's hundred best ones and ranks 85th among all represented institutional resources and the third – among Ukrainian ones;

- NTU "KhPI" is one of the institutions of higher education where the dual form of education is actively developing. According to the pilot project of the Ministry of Education and Science during 2019-2023, the university is planning to introduce a dual form of education in 11 programs;

- The university is a leader in the development of STEM-education as a long-term strategy for the formation of the contingent for technical programs, as well as inclusive education, which is a modern European trend in the development of higher education;

- NTU "KhPI" is a leader of professional training in the field of "Information Technology" according to the "Innovation Campus" project, which combines advanced educational technologies used in NTU "KhPI" and UNIT Factory;

- The university cooperates with partners from 26 countries and provides more than 300 international student trips each year (including the dual form of education and double degree programs two diplomas);

- NTU "KhPI" has 21 State Prizes of Ukraine in the field of science and technology for the period 1992 - 2020 and its laboratories and institutes recognized as national heritage;

- The university has a modern infrastructure for comprehensive scientific, educational and social development of students, which includes an educational campus of 12 buildings, a modern scientific and technical library, information and computer center, 15 student dormitories, a student's recreation palace, 2 sports centers, an open stadium with tennis courts and a football field, a sports and recreation camp "Polytechnic", a museum of the university history, 2 training and manufacturing centers, a business incubator and the necessary infrastructure for the development of startups, three student self-government organizations, a department of reserve officers military training, and several coworking and educational spaces.

The university comprises: 89 departments, 5 educational and research institutes and 4 faculties, Kharkiv Computer and Technology Professional College and Poltava Polytechnic Colleges, research and educational laboratories and centers, including the Innovative Business Incubator "SPARK"; Technology and Innovation Support Center (TISC); Center for Modern Technologies in Metallography; NTU KhPI Science Park LLC; Ukrainian-Turkish Scientific-Technological and Research Center; Intersectoral center of engine construction for armored vehicles; Center "Arsenal of ideas Ukraine / space of ideas" etc.

### **The goal and objectives of the strategic plan**

This Strategic Plan is the extension of the "Concept of educational activities of NTU" KhPI "for 2016-2025, approved by the Academic Council of the University on January 29, 2016 (Minutes №1) and" Strategic Development Plan of NTU "KhPI" for 2019-2025 ", approved by the Academic Council of the University on March 29, 2019 (Minutes №4). The necessity for its renewal is caused, first of all, by changes in the development trends of the world scientific and educational environment, understanding of the opportunities and threats facing the university at the national and global levels.

The purpose of this strategic plan is to form the University as the main educational and scientific innovation center of Ukraine for training engineering,

scientific, managerial and professional staff for industry, information technology, and related sectors of the economy and public life.

The main assignment of this Strategic Plan is to choose the best ways to implement the tasks set before the university and create an innovative breakthrough of the educational and research process at a qualitatively new level, which will provide competitive advantages within the world scientific and educational environment, facilitating best training for the students and research activity.

### **The mission of the university**

The university's mission is to:

- implement a wide range of educational services demanded by main specialized markets;
- carry out fundamental and applied scientific research, transferring its results into the educational process, meeting the needs of enterprises and institutions through effective technology of cooperation due to the succession of research traditions and schools;
- promote harmonious development of the personality and provide training for a new generation of professionals who can comprehensively combine research, project and entrepreneurial activities through successful mastering fundamental knowledge, study of engineering, acquirement of engineering creativity and entrepreneurial skills;
- increase the potential of opportunities to preserve their academic essence, originality and individuality.

The mission is achieved by implementing effective and purposeful educational, scientific, innovative and tutorial activities, ensuring the quality of tertiary education based on the preservation and development of classical university traditions.

## **The vision of the university**

NTU "KhPI" organically combines high-rate modern educational process, research and development, provides scientific and technical support for the transition of the national economy from the current state to the economy 4.0. It has an effective corporate management system capable of training competent human resources in many sectors of the economy both in Ukraine and abroad.

## **Strategic guidelines for the university development until 2025**

### *In the field of education*

- Ensuring the educational needs of Ukrainian and foreign citizens by providing training that meets high requirements of modern domestic and foreign labor market.

- Promoting the further transformation of NTU "KhPI" into a world-class university, recognized as a world educational environment, based on the internationalization of the main activities and, above all, training programs for university education, students' mobility and participation in international programs and projects.

- Carrying out the educational process as the constant change of the education content based on the new expertise necessary for the formation of a certain modern competence in the corresponding fields.

- Improving the quality of education to the world level on the basis of updating the content of education through new knowledge, modern technologies, international accreditation of educational programs, updating the material base and raising the professional level of teachers.

- Using in the process of development the advantages of university academic, scientific and financial autonomy, creating an internal system of quality assurance of bachelors, masters and doctors of philosophy training.

- Expanding master's programs and double degree programs due to collaboration with foreign educational institutions - partners of the University.

- Development, implementation and licensure of educational, including master's, programs with international participation of partner universities.
- Making students' language training more profound in all fields of knowledge.

### ***In the field of science***

- Ensuring the development of the university as an intersectoral research center and supporting investment projects in education and science.
- Carrying out the expansion of research work, both at the expense of budget funds and funds of industrial enterprises and firms. By 2025, ensuring the ratio of budget and contract science 1: 1 with a total of 60-70 million UAH.
- Expanding of the department participation in modern armaments research and development (tanks, armored personnel carriers, missile technology and electronic weapons).
- Supporting the work in the field of nanotechnology, "green" chemistry, information technology, physics, mechanics. Development of research work in the field of energy, energy efficiency of energy-intensive technologies and enterprises.
- Increasing the level of world recognition of scientific developments of the university, placing research publications in well-known world scientometric databases.
- Ensuring the further development of 40 scientific schools of the university, as well as research and design institutes "Molniya" ("Lightning") and "Ionosphaera" ("Ionosphere").
- Saving the number of researchers not less than 200.
- Achieving the annual provision 100-120 patents or certificates for intellectual property.

### ***In the field of Human Resources policy***

- Formation of the socio-cultural environment of the university, which contributes to the professional growth of employees, a balanced culture of internal

competitive environment of the university and the creation of a system of innovative education and elite training.

- Reduction of the teachers' average age to 45-48 years. For this purpose, develop a program of renewing the teaching staff and systematically transfer teachers of retirement age to part-time positions, for no longer than 2 years.

- Optimization of the structure of educational units (directorates of institutes / deans offices of faculties).

- Creation of KPI system for institute directors / deans of faculties and heads of departments.

- Creation of an effective system of professional development for teachers, researchers and teaching staff. Increasing the internship of university teachers in higher education institutions around the world.

- Increasing the number of PhD students at the university and ensuring the timely defense of their dissertations. By 2025, ensuring the defense of PhD dissertations up to 80 people / year and the defense of doctoral dissertations up to 10-15 people / year.

***In the field of methodological work and education quality assurance***

- Development and implementation of the program intended for young teachers to improve their scientific and pedagogical level and ensure sustainable development of the university.

- Ensurance of continuous improvement of the educational services quality management system in accordance with international standards ISO-9001 and standards and recommendations for quality assurance in the European Higher Education Area, developed by the European Association for Quality Assurance in Higher Education (ENQA).

- Development of the dual form of organization of the educational process, successful completion of the pilot project of the Ministry of Education and Science, according to which the dual form of education extends to 11 programs of the university.

- Expansion of the practice of teaching a foreign language for PhD students, young scientists, young teachers and providing maximum assistance in improving the language skills of university staff. Developing a program of material incentives for employees to earn a B2 certificate.

- Development of the mechanism of active involvement of IT companies for the formation of project tasks and participation in mentoring.

### *In the field of international activities*

- Formation of an international intercultural student environment at NTU "KhPI".

- Use of international cooperation to ensure the European level of organization and realization of the educational process.

- Ensurance of high quality of educational services for foreign citizens and persons without citizenship who arrive in Ukraine for educational purposes.

- The implementation of these tasks will be realized in the following strategic areas:

- Ensurance of the functioning of the English language in NTU "KhPI" as a working language at all levels of educational and scientific activities.

- For the active integration of university students into the European and global educational space, it is necessary to increase the number of students traveling abroad for included studies, internships, industrial practice or sports competitions to 500 people per year within five years.

- Multi-vector integrated development of international partnerships with leading foreign higher education institutions and research institutions on the basis of research and technical projects and curricula.

- In order to expand cooperation with relevant international partners, to establish a system of relations with trainees, graduates and university staff working in foreign universities.

- Intensifying international cooperation in scientific and educational spheres and improving the qualifications of the teaching staff in five years. It is necessary

to increase the number of teachers, who travel abroad to implement personal grants, internships and to carry out international research projects and programs, and educational projects, to 200 people a year.

- Strengthening international grant activities and fundraising as tools for innovative, technological and financial support of the university, by significantly increasing the number of projects under priority educational international grant programs Erasmus +, governmental European and global programs and the number of international individual grants.

- Intensifying the image factor aimed at increasing the number of entrants, to provide opportunities for Ukrainian students to study German, French and Polish to participate in relevant international projects and double degree programs.

- Ensuring the financial stability of the university and increase its world ranking, annually increasing the contingent of foreign students of the main faculties, the faculty of pre-university training and PhD students by 200 people to reach the total contingent of 2500 foreigners in five years.

### ***In the field of tangible resources development***

- Ensuring the tangible base development through major repairs of educational buildings, classrooms, department laboratories, the campus territory and dormitories.

- Developing a gradual planned renovation of the tangible resources of educational subdivisions, which will include modernization of the laboratory base for fundamental disciplines departments by 2024.

- Completing the sports camp "Polytechnic" reconstruction in Figurovka and the sports complex stadium by 2025.

- Finalizing the reconstruction of the project training building under the program "Innovation Campus" at 48a Alchevskiy Street in 2022.

***In the field of educational work, popular sports and social protection***

- Forming national consciousness, dignity of the citizen, developing respect and love to the native land and Ukrainian traditions.
- Training of the conscious intellectuals for Ukraine, preservation the nation's intellectual gene pool.
- Developing a clear civil position, instilling in young people faith in the rule of law, which is the only guarantee of freedom.
- Forming healthy lifestyle benefits in the public consciousness, the cult of socially active, physically healthy and spiritually rich personality.
- Creating the necessary conditions for the effective development of student government, identifying its potential leaders and organizers.
- Ensuring a high level of young people's professionalism and nurture, promoting the development of individual abilities, talent and self-realization.
- Nurturing respect for our alma mater, observance and development of our higher education institution's democratic and academic traditions.
- Impact on the society's socio-economic development through the introduction of innovative educational and research technologies, entrepreneurship and the startup movement.
- Focusing pedagogic work on the formation of partnerships between teachers and students, intercultural communication and creative atmosphere.

***In the field of university financing***

- Directing the strategy of financing university activities to the preservation and development of scientific schools, teaching staff and material and technical base as a basis for quality training of future specialist generations in Ukraine.
- Introducing a transparent mechanism for the distribution of material resources between educational units (institutes / faculties, departments) on the basis of Key Performance Indicators (KPI).
- Establishing a fixed percentage of funds to be sent annually to solve social problems: allowance grants, bonus payments, financial assistance payments.

*In the field of information technology*

- Disseminating the information technology use in the educational process, the development of mixed and distance learning.

- Introducing of electronic document management between all departments at the University through the development and implementation of modules in the ACS NP by 2024.

- Transition to the "Institute in the phone" mode, for which the ACS NP system is due to become a basic tool.

- Implementing all communication through a unified Office 365 system.

- Transfer of 70% of lectures and methodological support fo educational process to electronic carriers.

- Modernization of the main university site and web resources.

- Gradual provision of all departments with quality computers and office equipment.

These are the basic strategic objectives significantly complemented by the tasks of the second level determined by the components of the university roadmap.

## **ROADMAP FOR IMPLEMENTING THE STRATEGIC DEVELOPMENT PLAN OF NTU "KhPI" FOR 2021-2025**

This roadmap is an integral part of the strategic development plan of NTU "KhPI" for 2021-2025 and is designed to specify the key goal (mission, vision), to supplement their content with innovations that are missing in the strategic plan, as well as to reveal specific areas of further university development, indicate the specified tasks and ways of their solution.

### **Plan for the implementation of the development strategy of NTU "KhPI" in the field of education, methodological work and quality assurance of educational activities**

#### **The strategic development plan provides:**

- systemic changes in the work of the university departments due to systemic transformations in the functioning of these departments;
- improvement of the department functioning where work should meet the challenges of the time;
- setting strategic goals, objectives, means of achievement.

The departments' operations are planned for five years as follows.

#### **Modernizing the activities of institutes (faculties) in order to provide quality educational services:**

1. Introducing evaluation of the effectiveness of institutes (faculties) according to KPI indicators, for which each director (dean) and head of the department must sign additional agreements to their existing contract.

2. Forming the structure of directorates (deans) in the part of seven deputy directors (deans), among which there will be:

- Deputy for Educational and Organizational Work;

- Deputy for Educational Work and Humanitarian Affairs;
- Deputy Head of Research;
- Deputy for Methodical Work;
- Deputy for Physical Education;
- Deputy for Distance and Online Learning;
- Deputy for Work with Foreign Students.

As has been coordinated with the rector of the university, a deputy for work with the contract contingent may be introduced, but the number of the deputies should not exceed seven.

3. Ensuring an increase in the contingent of students of institutes (faculties) through admission of the students to the first year on budget and contract forms in accordance with the indicators approved in the KPI of directors (deans).

4. Ensuring the successful entry of fourth-year graduates to the master's program through the implementation of a new concept of preparation for the entrance exam. The planned increase in the number of entrants to the master's program is included in the KPI of directors (deans).

5. Implementing the successful completion of accreditation of educational programs, which are developed at the institute (faculty), in accordance with the approved schedule of accreditations.

6. Ensuring the planned growth of university students' participation indicators in the 1st and 2nd stages of student Olympiads in accordance with the KPI.

**For increasing the efficiency of the Educational Department it is necessary:**

1. To establish a systematic approach to the accreditation of educational training program through the National Agency for Higher Education Quality Assurance.

2. To implement an automated approach to the formation of the schedule of classes by the dispatching department due to the algorithm that must be developed by the ACS NP.

3. To implement a new concept of professional development in accordance with the requirements of the Ministry.

4. To implement the following modules in the ACS NP:

- educational assignments at the departments and deans' offices;
- teachers' individual plan;
- available lecture halls and classrooms.

5. To develop and implement an algorithm for automated selection of free choice disciplines by students through the student's personal on-line office.

**For increasing the efficiency of the Methodological Department it is necessary:**

1. To form a single information environment for methodological support of the educational process at the university (normative documents of the university, minutes of the methodological council, dual education, methodological seminars and conferences, recommendations for methodological work, etc.).

2. To develop common forms of educational and methodological complex.

3. To develop the principles of game design in the context of gamification and to introduce them into the educational process.

4. To introduce methodological support for research and teaching staff to improve their skills.

5. To provide methodological support for the organization of the educational process according to the project form of education "Innovation Campus".

6. To provide methodical and documentary support of dual education in NTU "KhPI".

7. To provide methodological support for distance and blended education, development and updating of documents governing distance and blended education.

8. To develop a modern website for the Methodological Department.

**For increasing the efficiency of the Education Quality Assurance Department it is necessary:**

1. To continue the practice of the quality management system certification in accordance with DSTU ISO 9001.
2. To restart the work of the quality council, that should be aimed at performing specific tasks to improve the quality of educational services.
3. To create a system of quality commissioners at all management levels, especially (department - directorate (dean's office) - administration).
4. To create a working system of internal audit of the educational services quality.
5. To transfer monitoring studies of students' residual knowledge to a higher level.

**For increasing the efficiency of the Central Admissions Committee it is necessary:**

1. To introduce trainings for those in charge of career guidance and admissions committees in order to eliminate the problem of insufficient qualifications of admission commissions employees and department representatives to conduct effective negotiations for recruiting applicants to enter NTU "KhPI".
2. To integrate the performance of admission commissions and those responsible at the departmental level (including cases dealing with applicants' conflict by tracing their contacts with NTU "KhPI").
3. To develop and implement a new type of preparatory courses (IT, STEM, career guidance).
4. To reconstruct lecture hall 102 in building U2 into a lecture hall for a new type of preparatory courses.

5. To create a unit that is subordinate to the Central Admissions Committee in order to maximize the potential of the educational center "Donbass-Crimea-Ukraine", to allocate office premises for the educational center "Donbass-Crimea-Ukraine".

6. To create an open recreation area in the lobby of the first floor of U2 in front of the cafeteria - during the admission campaign for consulting and paperwork of entrants (including those from Donbass), which at other times may serve as co-working space for students.

**For effective implementation of Preparatory Courses it is necessary:**

1. To continue the introduction of a mixed form of training for students of preparatory courses and raise this kind of training to a decent level (introducing advanced educational and methodological hardware and software technologies).

2. To stimulate the desire of teachers of NTU "KhPI" to teach in preparatory courses through changes in the Regulations on working time planning.

3. To ensure the opportunity of attracting university students with a bachelor's degree to work as teachers in preparatory courses (primarily for teaching foreign languages).

**For increasing the efficiency of the Department of Contractual and Practical Training it is necessary:**

1. To review the curricula and include introductory internships after the 1st year (in the form of enterprise tours by large groups of students), and industrial internships after the 3rd year.

2. To expand international cooperation (making agreements for practice, long-term agreements and agreements for future employment) with leading international higher educational institutions, establishments and organizations.

3. To monitor expelled contract students, students transferred from the contract to the budget and vice versa, join Uniform State Electronic Base on Education and staff of the department to be trained in the use of this database.

**For modernization of the “Career” Center functioning it is necessary:**

1. To improve the site of the “Career” Center of NTU "KhPI".
2. To start cooperation with NTU "KhPI" graduates. To create a page "The best graduates of NTU" KhPI "" (alumni gallery, interviews etc.) on the website of the “Career” Center of NTU "KhPI".
3. To create a page of the NTU "KhPI" employers database on the “Career” Center website.
4. To continue the organization and holding of the annual event "Fair of vacancies POLYTECH", cooperation with the regional employment center of Kharkiv in NTU "KhPI" graduates’ employment promotion, joint work with employers.
5. To resume the organization and holding of "Career Days at NTU KhPI", joint work with departments representatives for the selection of vacancies for students.
6. To start holding meetings, round tables with graduates at the departments within the Association of Alumni of NTU "KhPI" performance (pupil – student - graduate).
7. To continue organizational activities to assist in the employment of graduates (advising students on job search, resume writing, interviews; meetings with employers; online testing; presentations; round tables; trainings; business games; excursions etc.)
8. To fill in and check the electronic database of graduates’ employment with NTU "KhPI" master’s degree in the department workstation.
9. To resume (after the end of the pandemic) cooperation with foreign employers, to search for information on the availability of vacancies with foreign employers, to post relevant information on foreign vacancies on the website of NTU "KhPI".
10. To carry out the preparation of various statistical data and reports on the employment of graduates and their coverage on the website of the “Career” Center of NTU "KhPI".

**The modernization of the Editorial and Publishing Department embraces the following:**

1. Introducing electronic document management: electronic application, electronic signature of the head of the department, electronic version of the manuscript for editing etc.
2. Reducing the list of supporting documents for the promotion of manuscripts. Entering the electronic signature of the reviewers.
3. Establishing an electronic document flow in preparation for the meeting of the editorial board.
4. Resuming the seminar "Publishing" with a more practical focus in education - "School of Young Teachers".
5. Continuing holding competitions for the best book, textbook with the stamp of the Academic Council, for the best monograph and a series of guidelines.

**Plan for the implementation activities of NTU "KhPI" development strategy in the field of science**

For further development of scientific research at the university, in the R&D Institutes "Molniya" and "Ionosphere" to support the research work of 40 scientific schools, it is necessary to increase the volume of scientific work, both at the expense of budget funds and funds of industrial enterprises and companies. It is necessary to increase the volume of research work at the expense of international grants and involve all structural units (institute, faculty, and department) in fundamental and applied research. To support work in the field of nanotechnology, "green" chemistry, information technology, physics, and mechanics. To develop scientific work in the field of energy, energy efficiency of energy-intensive technologies and enterprises etc. To create conditions for further development of the "Science Park" of the university. For increasing the level of world recognition of scientific developments of the university to direct the publication of research works to the rating world publications. To participate in domestic and world

rankings of higher education institutions. To carry out accreditation of programs for which doctors of philosophy and doctors of sciences are trained. To nominate important results of research work for the State Prizes of Ukraine and more.

**Among the main measures for NTU "KhPI" community in the scientific field it should be noted:**

- to ensure the development of the university as an interdisciplinary research center and support investment projects in education and science, the university administration together with structural units of the university should work on the establishment of 3 State key laboratories, 2 centers for joint use of research equipment and 1 scientific facility, constituting the national heritage, and supply them with modern research equipment;

- to preserve the scientific potential of our university and to provide jobs in research institutes and laboratories of the research part of the university for at least 200 full-time researchers, including 10-15 doctors of sciences and 50-60 doctors of philosophy, through the participation of each department of the university in competitive selection of research projects, scientific and technical (experimental) developments by young researchers and competitive selection of scientific research projects and developments which are carried out at the expense of the general fund of the state budget of Ukraine and which are carried out by the Ministry of Education and Science of Ukraine;

- to increase the volume of research work, both at the expense of budgetary funds and funds of industrial enterprises and companies, all departments of the university must participate in national and international scientific competitions held by the Ministry of Education and Science of Ukraine (bilateral international competitions, government contracts for scientific and technical (experimental) developments and scientific and technical products, NATO's "Science for Peace" program, International European Innovative Scientific and Technical Program EUREKA), the National Research Foundation (competitions "Science for Human and Social Security" and "Support for Research by leading and young scientists"),

to intensify the work with the State Company "Ukroboronprom", other organizations and enterprises;

- to increase the level of world recognition of scientific developments of the university to send scientific papers to the well-known world editions which are a part of scientometric bases. Rector's office of the University must improve the system of incentives for scientists, research and teaching staff of departments, faculties and institutes simultaneously with the introduction of the following requirements for contract renewal: mandatory publications for doctors, professors at least 1 publication per person per year in SCOPUS and WoS, for PhDs, associate professors – 1 publication per person in SCOPUS and WoS for 2 years; incentives only for the authors of publications with a self-citation of no more than 20%, as well as additional bonuses for authors of publications in the editions of the first and second quarters, joint publications with foreign partners from 3 or more countries;

- to improve the patent and licensing activities and protection of intellectual property rights, to increase the number of protection documents submitted per year by 1.5 times by 2025 by providing each educational and methodological work with DOI, and for educational and methodological manuals, monographs, etc. - to obtain a certificate on the registration of copyright to each work;

- for further improvement the position of the university in international rankings QS World University Ranking, Times Higher Education World University Rankings and domestic rankings the university administration together with structural units must: provide further enhancement of the university rating requirements for scientists, research and teaching staff of departments, faculties and institutes, taking into account the methodology of international ratings. For the QS World University Rankings among domestic and foreign partners of the university it is necessary to select and propose up to 400 academic experts and up to 400 employer experts annually. To introduce the practice of annual publications in foreign editions of QS World University Rankings, Times Higher Education

World University Rankings with mandatory participation in seminars and round tables held as part of the activities of these rankings, etc.;

- each specialized department is to submit at least 2 research works of students to the university competition of student research works with coordination of requirements to these works according to the requirements of the All-Ukrainian competition of student research works;

- to ensure the increase of the number of publications up to 5-7 that will be included in the domestic list of category A publications and international databases SCOPUS and WoS, to invite foreign colleagues to university publications of category A for their inclusion in the editorial board or reviewers; to increase the number of polytechnic scientists who are members of editorial boards in category A publications and in foreign publications that are part of the Scopus and Web of Science databases;

- university departments are to use the innovative infrastructure of the university (LLC Scientific Park NTU "KhPI", Startup Center "SPARK"; Chernovetskyi Investment Group, Ukrainian-Turkish Scientific, Technological and Research Center, Scientific and Technical Training Center (STTC), Interdisciplinary Center for armored vehicles engine Engineering, Center "Arsenal of Ideas Ukraine / Space of Ideas", etc.) to create Start-up projects and promote them on national and international markets. Innovative infrastructures are to assist departments and divisions of the university in the creation of certified testing laboratories, provide research and technical assistance in the process of implementing the results of the scientific and technological revolution, including the creation of innovative business entities; to intensify cooperation on the basis of previously concluded agreements with enterprises and organizations etc.;

- PhD department is to improve educational and scientific programs and curricula for training doctors of philosophy for the successful completion of their accreditation. Revision of the structure and concept of educational programs requires consideration of the admission of foreign citizens to PhD studies, the introduction of educational components that will ensure the development,

formation and implementation of start-up projects with the participation of PhD students, involving potential employers in teaching within educational and research programs, matching the admission to the master's educational and scientific programs in specialties that have a continuation of the major in PhD studies, which will ensure the completion of the future dissertation. This will increase the contingent of PhD course and the number of timely defended dissertations;

- research and design institutes "Molniya" of NTU "KhPI" is to modernize and repair the main research facilities, primarily the Impulse Voltage Generator (IVG) 12/30; provide paid services for the certification of devices for resistance to interference from pulsed electromagnetic fields of natural and artificial origin; to conduct research and provide services on grounding systems of domestic NPPs, TPPs, HPPs and other objects of energy in other sectors of the domestic economy; to increase the efficiency of research and design works to UAH 20 million.

### **Plan for the implementing activities of NTU "KhPI" development strategy in the international sphere**

1. To ensure the functioning of English as a working language at all levels of educational and scientific activities from 2021 to 2025, the share of university teachers who have a B2 certificate will be increased to 30%. For this purpose, material encouragement of teachers for obtaining the B2 certificate will be continued. The university methodological department will annually hold free English language classes for 20 university teachers. It is planned to increase the participation of teachers and students in the international programs of the British Council for the study of English. The practice of obtaining corporate discounts for students, teachers and researchers of the university who study English in commercial structures will be continued.

2. To ensure an increase in the number of students going abroad for inclusive studies, training, internships or sports competitions to 500 people

annually within five years, it is necessary to increase the number of international educational projects (primarily Erasmus) to 57-60 yearly.

3. To implement the multi-vector development of international cooperation with foreign higher education institutions on the basis of bilateral agreements on scientific and technical projects and educational programs, partnerships will be established not only with leading universities in Europe but also with universities in China, Turkey, Morocco and UAE.

4. For the introduction of appropriate communication mechanisms and in order to expand cooperation with international partners, the contacts with interns, alumni and university staff working at foreign universities will be actively used, foreign branches of the NTU "KhPI" Alumni Association will be set up.

5. To intensify international cooperation in scientific and educational spheres and improve the qualifications of the teaching staff within five years, the number of teachers who travel abroad to implement personal grants, internships, carry out international research projects and programs and educational projects will be increased up to 200 people annually. To do this, it is necessary to intensify the university's participation in reputable international organizations and networks with a significantly greater use of the opportunities of membership in them in order to develop the current activities of the university.

6. To provide opportunities for local and foreign students to take part in German-speaking programs of the university, it is necessary to consistently increase the number of attendees of the educational programs developed by the Educational Centre 'German Technical Faculty' from 100 to 350 students provided maintaining sustainable funding from our German and Austrian partners. It is necessary to organize a Ukrainian-German fellowship based on the Educational Centre 'German Technical Faculty' and to launch a summer Ukrainian-Austrian annual school on the basis of pre-university training of the International Education Faculty of NTU 'KhPI'.

From 2021 to 2022, with the participation and support of foreign DAAD and OeAD lecturers, it is planned to introduce students' testing for the ability to obtain

their licensed certificate of NTU 'KhPI'. Testing methodology is developed by Goethe Institute. The creation of the own certification centre will increase the prestige of studying a foreign language at NTU 'KhPI' both among the students and attendees of the Educational Centre 'German Technical Faculty', and among the foreign partners of our university. Testing for students is fee-based. The presence of a certified test (numbering more than 70 points) grants an applicant with a correction factor of 1.05 for the next selection in the scholarship programs of the Educational Centre 'German Technical Faculty'.

Summer fee-based intensive courses of German will be organized on the basis of the Educational Centre 'German Technical Faculty' beginning in 2021. The professional symbiosis of the university's lecturers of German, foreign lecturers and up-to-date educational interactive materials guarantees an unsurpassed result while the reasonable price of these courses makes this offer unique in the educational market.

It is planned to launch the website of the Educational Centre 'German Technical Faculty' in 2021. Among distinctive features of the site there will be a section aimed at finding partners for research projects, publishing joint articles and participating in scientific conferences in addition to the basic information about the Educational Centre, the programs and their cost.

From 2022 it is planned to launch German courses 'Activ Deutsch' for foreign citizens of pre-university training of NTU 'KhPI'. Foreign attendees, who choose the pre-university training at the Faculty of the International Education of NTU 'KhPI', will study the German language intensively from 'A' level to 'B1' and pass the test to obtain an international certificate. Also, at an attendee's request, there is an opportunity to continue studying German at one of the educational and research institutes and faculties of NTU 'KhPI'.

German lessons are conducted by NTU 'KhPI' lecturers, as well as by foreign lecturers from Germany and Austria. Duration: 10 months. Frequency: 30 hours per week. Price: according to the contract. Language of education: English.

Testing for an international certificate is discussed and paid for separately. Tests can be conducted by Goethe-Institut or the OSD.

It is planned to launch fee-based Polish courses for students of NTU 'KhPI' in 2021. The recruitment process to a test group for NTU 'KhPI' students is being conducted at the moment. The students who are fluent in Polish have the opportunity for free education at partner universities of NTU 'KhPI'.

7. The annual increase in the number of foreign students and post-graduate students by 200 people in order to reach a total number of 2,500 people in five years can be done due to the following factors:

- Increasing the number of English-language majors for foreign applicants (cyber security, road transport, ecology, etc.)

- Increasing the number of students of prime majors from the People's Republic of China by establishing cooperation with Chinese universities on joint training programs for bachelor's and master's degree students.

- Increasing the number of students of prime majors, students of pre-university training and PhD students from India, Nepal, Morocco, African countries and America by engaging new national contractors.

- Increasing the number of students from Turkey, Azerbaijan and Uzbekistan by intensifying work with relevant national subcontractors that have cooperation agreements with NTU 'KhPI'.

- Establishment of the Ukrainian-Asian Educational and Research Centre (Azerbaijan, Turkmenistan, Uzbekistan).

- Further reformatting of vocational guidance activities from the CIS countries to the Middle East, Africa, as according to the Law of Ukraine No. 2704-VIII of April 25, 2019 'On ensuring the functioning of the Ukrainian language as the state language', the language of vocational training for foreign students was changed (from Russian to Ukrainian and English), which led to a significant reduction in the number of Turkmen, Uzbek and Azerbaijani students.

- Language training of foreign applicants for further entering our university must necessarily take place at the pre-university training of NTU 'KhPI'.

- Increasing the number of pre-university training groups to 250 people by gradually increasing the number of English-speaking groups to 10.
- Developing corresponding English-language methodological support (6 training manuals and 10 methodological guidelines) with extensive use of computer presentations and development of online (long-distance) learning courses for the disciplines ‘Language of vocational training (English)’ and ‘Ukrainian as a foreign language’.
- Rejuvenation of the teaching staff of natural sciences department (1 associate professor with competence in English and Turkish with the corresponding B2 certificate) and humanity sciences (2 associate professors and 2 senior lecturers with competence in English with the corresponding B2 certificate) departments by engaging young English-speaking teachers with the corresponding level of training in the English language from the leading universities of Kharkiv. Preparing two PhD specialists; acquiring the title of associate professor of the Higher Attestation Commission of Ukraine by one employee; bringing the number of teachers with scientific degrees and titles in general to 50%.
- Implementation of a pilot project on social adaptation for Turkish students by teaching the disciplines of the natural science cycle in English and providing simultaneous translation into Turkish for better learning.

### **Plan for the strategy implementation in the field of tangible resource development**

According to the 2021-2025 strategic plan, the main challenge for the university is to systematically ensure the development of the facilities and resources via the fundamental renovation of academic buildings, classrooms and lecture halls, departments’ laboratories, campus and dormitories, as well as the gradual upgrade of the academic units’ facilities and resources.

According to the assigned tasks, the plan of the gradual upgrade of the academic units' facilities and resources, renovation of laboratory facilities, reconstruction work has been developed, namely:

- renovation of premises on the first floor of the U1-building to accommodate the Dean's Office for International Students;
- renovation work of the Main Classroom Building (MCB), namely the entrances to the basement, improvement of the courtyard, renovation of the premises on the first floor;
- development of the project of weight-bearing walls' shoring and floors of the Chemistry Department building, repair of pits and improvement of the territory around the building;
- supporting walls installation and improvement of the Metal Forming department's laboratory;
- renovation work of the Turbine construction department's room;
- renovation work of the Electrotechnical Faculty building (paving the surrounding area, repairing pits and emergency exits);
- renovation work of the Physics Faculty building (roof repair and reconstruction of the Large Physics Lecture Hall);
- renovation work at the Engineering Faculty building (paving of the surrounding area, repair of pits and eaves);
- renovation work at the Technical Faculty building; paving of the surrounding area, repair of pits, eaves and roof);
- renovation work at the Administrative building;
- renovation work and improvement of the Department of Plastic Mass and Biologically Active Polymers Technology;
- renovation work, improvement and current repair of the Laboratory building's roof;
- renovation work (pits, entrances to the basement) of Preparatory Department's building at the address 5, Vesnina Street;

- renovation work of Building №5 (repair and replacement of exhaust pipes, roof, eaves and general improvement);
- renovation work of the Sports Complex ‘Polytechnic’;
- renovation work and general improvement of the Students' Palace;
- carrying out scheduled repairs at the Industrial Training Centre’s processing site, garages for trucks of NTU ‘KhPI’;
- renovation work of the Research and Design Institute ‘Molniya’;
- carrying out scheduled repairs (replacement of wiring, kitchens, bathrooms, lightning protection and general improvement) at dormitories №1-7, 9-15;
- implementation of fire-fighting measures (dry powder extinguishers and special powder extinguishers) at the U1-building, Students' Palace, Main Classroom Building (MCB), dormitories №1, 3, 4, 5;
- completing the reconstruction of the Project-Based Learning’s building under the program ‘Innovation Campus’ at the address 48a, Alchevskogo Street in 2022;
- completing the reconstruction of the sports camp ‘Polytechnic’ in Figurovka and the stadium of the Sports Complex by 2025.

**Plan for the strategy implementation in the field of educational work,  
popular sports and social protection**

According to the tasks set in the Strategy, it is necessary to take the next step in the field of educational, popular sports and social protection.

**Pedagogical Work:**

Socially educational work at NTU ‘KhPI’ is aimed at preparing a new generation of Ukrainian intelligentsia, the core of the national intellectual elite and is intended to protect future professionals from negative factors for their physical, moral and psychological development and to help students acquire humanistic values. Ensuring independent thinking, ability to make non-standard decisions

(innovative style of thinking), to navigate freely in difficult circumstances of public and private life is an important task of socially educational work.

The main purpose of education at NTU 'KhPI' is the formation of conscious citizens – patriots of Ukraine, harmoniously advanced, socially active personalities, professionally literate, creative experts, who combine high spirits, morality, professional competence and physical perfection. The achievement of this goal is ensured by a high level of academic work, as well as constant improvement of the system of pedagogical work at the university.

The unity of education and upbringing of modern students is ensured by the unity of all elements of the educational process, all educational institutions and organizations. The main principle of staffing socially educational work is professionalism in connection with high moral and ethical qualities of the lecturers' personality. The entire teaching and support staff of the university is involved in the pedagogical work.

The following measures will be introduced in the university system:

1. Combining teaching and pedagogical work in the educational process of the university, using both individual and mass forms of education, as well as maintaining a creative tolerant atmosphere at the university, responsibility for the quality of students' training and education.

2. Use of the Students' Palace opportunities more effectively in pedagogical work.

3. Conducting mass readers' participation events in the scientific and technical library, organizing book and illustrative exhibitions for all anniversaries, constantly informing about new acquisitions to the funds (reviews of new literature and thematic information for university departments), hold themed nights, etc.

4. Providing tours in the University History People's Museum for students, teachers, guests of the University to form a sense of belonging to the history of the University and industry of Ukraine, to continue the tradition of the finest examples of the Ukrainian intelligentsia.

5. Intensifying the work of the Public Association ‘Alumni Association of NTU ‘KhPI’ to involve university graduates in the educational process.

6. Increasing participation of student self-government and student unions in pedagogical work among students.

7. Usage of the newspaper ‘Polytechnic’ as a great opportunity to inform the university staff about the areas and results of educational work.

8. Making active use of such activities as competitions for the best singer, the best creative team of amateur performances, the best dormitory etc.

9. Creating study diaries to improve the monitors’ work in the educational process.

10. Providing conditions for the work of students’ self-government and student unions, financially and organizationally.

11. Holding meetings with monitors on topical issues of the educational process and socially educational work organization every academic semester.

12. Improving and increasing the effectiveness of lecturers’ work in dormitories.

13. The psychological service of the university and the sociological laboratory have to conduct a survey among students regarding the organization of the educational process, mode of life, first-year students’ adaptation to the educational process to make adjustments to the work for dean’s offices and departments.

14. Holding weekly organizational meetings of deputy directors of institutes, deputy deans of faculties to discuss topical problems of students’ life in dormitories.

### **Students' Palace Functioning:**

The Students' Palace of NTU ‘KhPI’ ensures the implementation of state policy in the field of higher education and science, creating an effective system for organizing the development of students’ and staff’s creative abilities as a guarantee of the university educational and research potential sustainable improvement.

The main tasks of the Students' Palace are defined as follows:

- Creation of active educational and research environment that contributes to students' creative self-development in extracurricular activities;
- conducting recreational, scientific and educational events;
- initiation and support of creative teams, scientific and technical associations and groups, clubs, studios, amateur and other types of clubs.
- support of socially important cultural and educational, scientific and technical, cognitive and creative, artistic and aesthetic initiatives of the city and region;
- improvement of the forms and methods of educational and cognitive, cultural and educational work as well as scientific and technical work on the basis of studying and disseminating best experiences, engaging the university students and staff in them;
- amateur art, amateur folk creativity development;
- organization of students' civil and patriotic education;
- introduction of new forms of leisure in accordance with the needs of students and university staff;
- re-establishment of the Arts Council work in the Students' Palace.

The Students' Palace must implement the following measures to perform these tasks:

- to prepare and conduct thematic theatre and concert, game, sports, dance and entertaining, scientific and cognitive, family and other events and programs;
- to carry out state, folk, modern holidays and ceremonies, exhibitions of amateur artists, craftsmen of decorative and applied arts etc.;
- to organize and conduct festivals, reviews, competitions, exhibitions and other events showing the results of creative, scientific and technical activities of the Students' Palace units;
- to carry out plays, concerts, other theatrical and entertainment events, including those featuring professional creative teams and individual performers;

- to organize the work of lecture rooms, national universities, studios, courses, thematic evenings, oral journals, creative meetings, etc.;
- to carry out mass theatrical festivals, folk festivals, ceremonies, rituals in accordance with the traditions of the university, city and region;
- to organise recreational activities for different age groups, including night off's, discos, youth balls, carnivals, children's parties and other entertainment programs;
- to nominate amateur art groups for the title of the 'People's Artist';
- to develop the program to update musical instruments and stage costumes;
- to carry out international evenings with the involvement of foreign students on a regular basis;
- to create a permanent exhibition within the framework of Art KhPI 'Artists of KhPI'.

### **Popular Sports Work:**

The main tasks of Physical Education at the university are maintaining a socially sustainable level of physical training of students and staff, creating a healthy lifestyle, counteracting negative impact on the health of university staff with the means of Physical Education and sports factors, developing the ability to use Physical Education for labor and leisure, promoting the development of collectivism in the polytechnics' life and work. The main university sports centre is the Sports Complex, which features an athletics arena, a 50-meter swimming pool, an integrated game room that meets all competitive requirements, specialized gyms and a complex for all-around competitions. An outdoor stadium with a football field, jogging tracks, tennis courts, volleyball courts and a gym are part of this complex. Students' and staff's health improvement is carried out in the sports and recreation camp 'Polytechnic' at Figurovka which is situated on the banks of the Sivers'kyy Donets' River.

The main tasks are defined as follows:

1. To implement sustainable development of own school of Physical Education, the facilities and resources for the preparation of highly skilled experts in the field of Physical Education and to achieve conditions of high achievement sport's support.

2. To increase the number of students at faculties participating in the university's Sports Contest that is up to 19 kinds of sports.

3. To adjust the plan of educational work on Physical Education for 1-3 year students annually planning at least 12 credits in the specialists' curricula training.

4. To expand the network of sports sections, maximizing the number of participants, improving the quality of work and applying different types of individual and group classes.

5. To provide a widespread support for sports clubs (mountaineering (climbing), tourism, basketball, football, badminton clubs, etc.).

6. To carry out traditional all-university sports events annually: 'Health' Sports Contest for faculty and staff, traditional spring cross, athletics competitions on 'Freshman Day', relay race on Victory Day, M. F. Semko's Cup and football Super Cup, NTU 'KhPI' students primary trade union organization's Cup in different sports, NTU 'KhPI' Rector's Cups in basketball and sambo, the international youth water polo tournament in memory of O. Barkalov, the tourist and mountaineering clubs' sports event etc.

7. To involve the Sports Complex in the career guidance work of the university more actively.

8. To extend work in professional sports, systematically increase the number of the participants in Ukrainian and international competitions, increasing the number of Masters of Sports.

9. To encourage lecturers who have the 'Masters of Sports' and the 'Honoured coach of Ukraine' titles for the preparation and defense of doctoral and candidate theses.

10. To provide support to the athletes who defend the honour of the university and the state in the world, European and Ukrainian competitions and

widely cover their achievements in the media (relaunch the assignment of donor scholarships for high achievements in sports).

11. To engage schoolchildren who have potentially high achievements in sports to enter the university.

### **Employees' and Students' Social Protection.**

For the period until 2025 the following measures will be planned for constant implementation:

1. Ensuring timely payment of scholarships, salaries, money for vacations and health care.

2. Paying rector's allowance awards, remunerations up to 2 million UAH per year, at the cost and expense of the salary fund.

3. Providing financial assistance up to 800.000 UAH to employees and lecturers and up to 150.000 UAH to students, annually.

4. Improving systematically the condition of the sports and recreation camp 'Polytechnic' for recreation of students, teachers and their children, to carry out core refurbishment of buildings and campuses, sports grounds and recreation areas.

5. Providing the students, academic staff members and other employees with preferential use of sports sections in the university Sports Palace (with the discount up to 50%).

6. Providing lecturers and staff with the opportunities to hold additional positions for 0.25 and 0.5 base salary by increasing the workload, expanding the service area or intra-university part-time job, respectively.

7. Concluding agreements with trade union committees on timely improvement of the conditions to study and work in educational buildings and live in dormitories.

8. Allocating funds of 300-400 thousand UAH annually to purchase work clothes and increase the level of safety of students and teachers in the academic process.

9. Creating modern social and living conditions in dormitories. Implementing the concept of self-service, when a student lives in a dormitory in case of reduction of the prime cost of living. Implementing modern technologies to improve energy saving and heat supply in dormitories.

10. Expanding the list of health centre services for students and university staff.

11. Improving the catering for employees and students in cafeterias and buffets, to expand the range and improve the quality of food, as well as to improve the level of service.

### **Plan for the strategy implementation for the Scientific and Technical Library of NTU "KhPI" development**

The work of the Scientific and Technical Library is one of the important factors contributing to open science and open education, development, creation, preservation, access and use of in-house and world information resources that correspond to the educational and research processes at the university. It is the library that provides the information research needs of university students, academic staff members and other employees on the principles of accessibility, efficiency, information content and comfort.

Therefore, the establishment of a detailed development roadmap for the Scientific and Technical Library is one of the key components of effective university development.

The main tasks set for the library for the 2021 – 2025 period are as follows (according to directions).

#### **Customer Service:**

- Promotion, advertising and use of the works of the University scientists in the educational process, by generating in-house electronic information resources

(full-text databases, bibliographic projects, assistance to the editorial staff of scientific journals of the university, etc.) and registering them in world resources.

- Creation of such a level of service that the Library becomes a permanent place of residence for readers-students in their free time from lectures, seminars and tutorials.

- Enhancement of the practice of receiving feedback from the library users.

- Common with the university administration contribution to improving the quality of education by providing access to non-formal education, the development of distance learning, including by organizing access to distance courses by world's leading universities.

- Monitoring providing educational programs with methodological literature.

- Improvement of the interlibrary season tickets' system services and electronic document delivery (EDD) using information and telecommunication technologies, implementing the international interlibrary loan (IIL).

- Organization of open areas for comfortable reading and areas of free access to the Library stock.

### **Updating Document and Information Resources:**

- Acquisition of information and library resources in accordance with the curriculum, research topics of the university's research work (systematic replenishment and updating of the library stock, subscription of a sufficient number of Ukrainian and foreign periodicals and specialized databases of scientific resources).

- Expansion of the electronic base of information and educational resources of remote access, 100% provision of electronic educational resources for all academic disciplines.

- Updating the stock on the basis of monitoring the efficiency of using information and library resources to determine the compliance of the volume and composition of resources with the requirements of the educational process and research work.

### **Maintenance of the Library Stock in Accordance with Modern Requirements and Norms:**

- Ensuring proper storage conditions, digitization and access to rare publications stored in the Library.
- Creating the Museum of the Book on the basis of the Library Department of Rare Books and Manuscripts as part of the University cultural and educational infrastructure.
- Digitisation of the university's issues and its scholars' works for the formation of the full-text collection.

### **Creation of the Research Assistance Apparatus:**

- Completion of the Library stock recatalogization for further integration of the received bibliographic records into the electronic catalogue and improvement of the linguistic support of the electronic catalogue.
- Ensuring the codification of existing methodological materials in the full-text database of the electronic catalogue.
- Implementing the concept of open access to the results of scientific research at the university through the institutional repository development, support for open access policy and other similar projects.
- Development of the library's project activities.

### **Reference, Bibliographic and Information Services:**

Presentation of the research results of the university scientists to the Ukrainian and international scientific community by registering their own generation resources in the world scientific resources, placing the works of the scientists from higher education institutions in Ukrainian and international information and library resources (ensuring the correctness and completeness of data on the publications of scientists in analytical information systems, the indicators of which are used in the formal assessment of the university's activities,

advertising and training work with resources for the analysis of periodicals with a high impact factor, drawing up recommendations and technological instructions for working with international abstract databases of scientific citation and disseminating them among the library users, developing bibliometrics as an element of performance and effectiveness assessment of scientific research etc.).

- Increasing the users' level of information culture: active learning technologies development; carrying out educational and complex information activities adapted for various categories of users.

- Forming the library services aimed at the of scientific communications development and research support, as well as forming the Library's modern educational services portfolio in the areas related to bibliometric literacy, academic writing skills development and work with bibliographic managers.

- Developing a new concept for filling social networks of the library with the content taking into account the reader's preferences.

### **Cultural and Educational Work:**

- Organizing and carrying out informational, cultural and educational events (lectures, roundtable, discussions, book and art exhibitions, presentations, trainings, workshops, etc.).

- Close cooperation with the city and region art institutions (Kharkiv children's music school №1 named after Beethoven, Kharkiv Regional Philharmonic, Theatre 'Polytechnic', Kharkiv embroidery club «Success», etc.) with the purpose of aesthetic education of student youth.

- Active cooperation with the university in carrying out vocational guidance work among schoolchildren (library tours, getting familiar with the Library services and work, etc.).

- Organization of social clubs and amateur groups in the Library.

### **Automation of Library Processes:**

- Further implementation and use of modern information technologies in the work of the Library (the site development, ensuring the functioning of full-text databases, ensuring copyright for publications placed in the full-text databases of the library, optimization of the research assistance apparatus for the entire library stock, providing local and remote access to its own and external electronic resources etc.).
- The development of services for the documents electronic delivery that provides documents digitization upon request.
- Implementation of the electronic document management system.

### **Research and Methodological Work, Management, Staff Development:**

- Completion of the development and streamlining of the Library normative and technological documentation. Updating the content of the Library employees' job descriptions in connection with the redistribution of employees' responsibilities.
- Active participation in international projects, involvement of grant funds for the development of the Library and the implementation of new initiatives.
- Increasing the staff qualification level (development of a new program for library personnel's advanced training and development for a long-term period, improvement of the motivation and incentive system, periodic performance appraisal of workplaces according to the criteria of their industrial safety and organizational efficiency, organization and carrying out conferences, seminars, etc.).
- The provision of staff performance appraisal to determine the specific share of the existing professional potential in accordance with the modern requirements of the Library development.
- Organization of the English language course to increase the Library staff's command of foreign languages.

- Qualitative renewal of the Library staff – recruitment of young, qualified, up-to-date specialists on a competitive basis.

**Improvement of the Facilities and Resources and Technological Infrastructure:**

- Ensuring the purchase of licensed products and regular updates of the software used in the library.
- Purchase of the equipment for digitizing publications and information terminals for the installation in the library lobby.
- Purchase of multifunctional furniture, which will make the library space mobile and use it for various events to create a favourable, comfortable environment that meets the modern needs of users; modernization of the library premises design in accordance with modern trends; equipping the hall with comfortable furniture and non-slip flooring.
- Creation of open areas for comfortable reading.
- Renovation of engineering systems (heat supply and air conditioning), computer networks, restoration of turnstiles and setting up a fire alarm) to create stable operation of all systems and comfortable conditions for staying in the library.
- Equipping the library premises with pointers on the location of different library departments for the users' convenience, replacing the signs on the doors with the appropriate ones.
- Equipping 6 library book depositories with bookstacks.
- Providing users with workplaces equipped with means of communication and information visualization with the possibility of their further increase and improvement, taking into account special needs of some users.
- Reconstruction of the library premises at the Main Classroom Building (MCB);
- Reconstruction of some toilet rooms taking into consideration some users' specific needs.

## **Plan for the further development of NTU "KhPI" financial strategy**

The main goal of the university's funding strategy is to take care of and develop the human potential of scientific schools, facilities and resources, scientific research, international relations, as well as to train the future generation of experts. According to the university's strategy, it is necessary to take the following steps:

1. University departments and other units shall work actively to increase the funding flows in a special fund via international grants, by increasing the number of foreign and Ukrainian students trained on a contractual basis, investment contributions from university graduates.

2. Departments and laboratories shall certify the products of mechanical engineering, food and chemical industries, as well as in the field of production and supply of electrical energy.

3. Departments and laboratories shall organize and conduct advanced training courses for workers in various industries.

4. To receive financial revenue for the departments' development of the facilities and resources through public-private partnerships and leasing programs.

5. The received financial resources shall be directed to the needs of students, lecturers, researchers for their social protection and improvement of working conditions.

6. Optimal planning of financial resources shall ensure that salaries, scholarships and health improvement funds are paid on time.

7. To plan the budget for financing the activities of student self-government in the amount of 0.5% of the university funds.

8. To improve the quality of academic work, plan for teachers the maximum allowances to official salaries (PhDs – 15%, associate professor – 25%, doctor of science – 20%, professor – 35%).

9. The allowances for the lecturing staff are to be paid at a rate of 20%.

10. To pay long-service bonus from 10 to 30%, for the title of 'Emeritus' – 20%.
11. Make provision for expenditures on bonuses, doctoral allowances and financial assistance, provided that the salary fund is saved.
12. To encourage the timely execution of important work, subject to the availability of vacant positions, to make additional payments for expanding the service area or intra-university part-time work in the amount of 50% of the salary.
13. To support the formation of a great number of PhD students, as well as the young lecturers' training, pay for 70 positions of teaching trainees.
14. To support young lecturers who work at 0.25-0.5 base salaries, appointing the rector's allowances.
15. To plan rector's allowances for the heads of the Students' Palace creative teams.

### **Plan for NTU "KhPI" personnel strategy implementation**

According to the tasks set in the strategy, it is necessary to:

1. Conduct a personnel policy in relation to the rejuvenation of the teaching staff. To that end, to develop a program for the renewal of the teaching staff.
2. Systematically transfer lecturers of retirement age to positions on a part-time basis and for a period of up to 2 years.
3. Develop a rating system of research and teaching staff of the university based on the KPI system and develop a buyout program based on it. To take into account the additional activity of research and teaching staff (international relations, commercialisation, student research clubs, scientific works) in their personal rating and the rating of the units where they work.
4. Oblige directors and deans to keep records of key personnel and to prepare a personnel reserve in a timely manner.
5. Create a support system for PhD students after defending a thesis and completing their PhD course.

6. In order to rejuvenate the teaching staff of the department, attract new young experts before the beginning of the academic year in case of an increase in the total teaching load of the department and add extra staffing units.

**Plan for the implementation of development strategy of information technology at NTU "KhPI"**

1. To spread the use of information technologies in the educational process and to develop blended and distance learning, it is necessary:

- to develop and implement distant courses in the volume of the 'Resource' course 50% of the total number of training courses into the educational process for full-time study in 2021, with a subsequent increase in the number of courses to 100% in 2022;

- to develop and implement certified distance courses into the educational process for full-time study starting from 20% of the total number of training courses in 2021, with a gradual increase by 20% every year to 100% in 2025;

- to provide 100% certified distance academic courses for the educational process in the correspondence course in accordance with the curricula of each current year of enrolment during 2021-2025;

- to develop and implement certified distance English courses in the educational process for correspondence study, starting from 40% of the total number of training courses in 2021, with a gradual increase by 20% every year to 100% in 2024.

2. For the introduction by 2024 at the university of electronic document flow between all departments, it is necessary to expand the automated system for managing the educational process with the necessary components of managing the educational process. For this purpose, the following modules should be developed: 'Office'; 'Human Resources department'; 'Dormitories'; 'Academic Council'; 'Dispatcher's Office'; 'Scholarship Department'; 'Research Department'; 'PhD course' (already under development); 'Employees' Trade Union';

‘Methodological, Editorial and Publishing Department’ and to expand the module ‘Study Department’.

To develop new functionalities of the automated system for managing the educational process: workload management of the departments, assignment of lecturers in charge; report on ‘planning the workload of the department (work plan of the department per year)’; automated generation of a lecturer’s individual plan (first and second half of the working day); report ‘on the fulfillment of the workload of the department for the semester’.

3. To develop in 2021-2022: a dean/director’s electronic office (add-on to the lecturer’s office), a deputy dean’s electronic office (add-on to the lecturer’s office), a head of the department’s electronic office (add-on to the lecturer’s office), a vice-rector’s electronic office; the rector's electronic office; mechanism of student’s success records (individual admission to an exam which was failed), remote version for lecturer’s and student's offices; a journal of electronic progress records (individual admission to the rescheduling of an exam which was failed). To modernize the program ‘schedule of academic studies’, with reference to the academic assignments statements; the program ‘schedule of the examination period, with reference to the academic assignments statements.

4. To develop a mechanism for automatically generating courses in the Moodle system based on the information in the academic assignments statements (discipline, hours, weeks, lecturer, list of students with e-mail etc.).

5. To develop the following mechanisms in 2023-2024: students' elective academic disciplines; classroom resources management; users’ authentication with Office 365; users’ authorization by personal logins; automated generation of the class schedule; implementation of the electronic digital signature.

6. To modernize the main website of the university in 2021 and create web services (sites) of the university departments by 2024.

7. By the end of 2022 to develop a rating system for institutes/faculties, departments, lecturers, students, which is collected automatically.

8. To begin in 2021 and to complete in 2024 the transition to the 'Institute in the phone' model, for which the automated system for managing the educational process should become the basic tool.

9. To organize all communication at the university through single Office 365 system by the end of 2021.

### **The concept of Academic Council of NTU "KhPI" and the Secretariat of the Academic Council of NTU "KhPI" development**

NTU 'KhPI' Academic Council is a collegiate governing body of NTU 'KhPI', which, in accordance with the current legislation and regulatory documents of the university, deals with the main issues of the university's activities, ensuring the conditions necessary for a person to obtain tertiary education, training specialists for Ukraine, conducting innovative scientific research and education of highly qualified personnel etc.

In this context, planning the development of the university Academic Council in accordance with the overall strategy is of great importance. Based on this provision, the following steps were planned for Academic Council of NTU "KhPI" and the Secretariat of the Academic Council of NTU "KhPI" development:

1. Gradual optimization of the number of NTU 'KhPI' Academic Council members to improve its functioning.
2. Gradual expansion of the list of questions delegated to the Academic Councils of faculties and educational and scientific institutes.
3. To establish three working modes for holding meetings of the Academic Council: in-person, remote-in-person and remote. To use Office 365 for remote meetings.
4. To implement consistently electronic document management in the Secretariat of the Academic Council. Put into practice the shortened form of the printed minutes of the meetings of the Academic Council of NTU 'KhPI'. To conduct extended minutes of meetings in electronic form.

5. To update the university regulations on granting academic titles of professor and associate professor of NTU 'KhPI' and the title 'Honorary Doctor/Honored Professor of NTU 'KhPI'.

6. To optimize the procedure of awarding academic titles of the Ministry of Education and Science of Ukraine at the university.

7. To develop and approve the regulatory framework for the functioning of the new structure of the Academic Council – the Secretariat of the Academic Council of NTU 'KhPI'.

8. To change the service for providing information and organizational services of the Secretariat of the Academic Council of NTU "KhPI" for university employees and applicants to the online form using Office 365.

9. To organize technical support for the functioning of the Secretariat of the Academic Council of NTU "KhPI".

10. To develop a regulation on the provision of services by the university in the case of defending an academic degree by applicants from other educational or scientific institutions.

11. To create the electronic database for storing university employees' governmental, departmental awards and honors.

12. To create the university electronic database of experts and reviewers for the work of temporarily created specialized scientific councils.

13. To administrate the software package for checking academic plagiarism (Unicheck):

- distribution of the available volumes (determined by the contract) between departments, editorial offices of magazines and bulletins, Special Councils;

- verification of the submitted dissertations for the degree of Doctor of Technical Science and PhD in Technical Science for academic plagiarism (self-plagiarism);

- reporting on the presence of academic plagiarism (self-plagiarism) for the analysis by experts of the permanent NTU 'KhPI' specialized councils, reviewers and experts of the university temporary councils.