

Examined and approved by the  
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Protocol No1

**A Conception  
for the Development of National Technical University “Kharkiv Polytechnic  
Institute” throughout the period of 2016 to 2025.**

Nowadays, a higher education and appropriate level of knowledge are of great importance for the economy of developed countries. Mankind has entered a qualitatively new innovative era of its development that needs an advanced science and high-quality education, taking into consideration the contemporary high rates of the growth of the body of information and the shortened cycles of its refreshment.

Proceeding from the above, a strategic goal of the development of the university for the period of 2016 through 2025 is to achieve the innovative breakthrough in educational and scientific areas in order to provide a qualitatively new level of university activities by giving high-quality training to future specialists and meeting the demands of contemporary science.

The regulations and norms of the Laws of Ukraine “On Higher Education”, “On Scientific and Engineering Activities”, “On Publishing Business”, “On Copyright” and other legal acts define a further progress of the University to achieve the world level.

**National Technical University “Kharkiv Polytechnic Institute”:2016**

Recognition of the university in Ukraine and worldwide:

- the university was awarded the status of national educational and research institution and was given the fourth level of accreditation;
- the laboratories and institutes of the university were recognized as the national heritage;
- over the period of 14 years the scientists of the university were given 16 State Prizes in the field of science and technology;
- annually about 30 students of NTU ”KPI” come out on top in Ukrainian Olympics and about 60 students win the Ukrainian competition of students’ scientific papers;
- in the “TOP-200” rating the university ranked fourth among the Ukrainian institutions of higher education.
- the SCOPUS scientometric data show that the university ranks 9th in Ukraine;
- according to the Webometrics Rankings of World Universities the university ranks 6th in Ukraine.

In 2013 the university participated in QS “World Universities Rankings 2013”;

- The University joined the association of European Universities and Black Sea Region Universities.

### *The University Structure*

The University includes 95 departments, 22 faculties, 2 research institutes, in particular “Molniya” and “Ionosphere”, military school that trains tank crew officers and reserve officers, Kharkiv Computer Technology College, Poltava Polytechnic College and the Chernovtsy School.

The University has the resource base of the total area of 375, 000 m<sup>2</sup> that houses 200 buildings including the Palace of Sport, the Palace of Students and the fundamental library for 1,5 million tomes, 15 students’ hostels , 7 dwelling houses and the catering center.

“Slavutich” is the Kharkiv segment of Ukrainian scientific and educational telecommunication network URAN.

### *The educational process is provided by competent academics.*

Today the University gives training to about 16, 000 students in 19 areas and 40 specialties.

About 1,900 foreign students and postgraduate students from 47 countries of the world study at the university.

The educational process is carried out by 1,743 academics and 300 scientists that also do research; among them are 210 doctors of sciences and 872 PhDs.

Actually all the specialties provide academic programs for the master’s degree.

Annually about 2,350 students defend their bachelor’s degree, 938 students defend their master’s degree and 1,740 students are qualified as the specialists.

About 95 to 96% of students are offered an employment.

Important components of the educational process is the distance education and eLearning.

The content of education is defined by the curricula and academic programs that are developed taking into account the requirements of the Bologna process and the credit-unit system.

The University developed the conception of advanced studies of English in collaboration with the experts of the British Council.

The educational process is provided with methodical materials and published works, receiving the assistance of fundamental scientific library and computer-aided system, starting from the registration procedure through the issue of books; the “Manual” academic program is also of great assistance.

The University did a great organizational work to retain the military school that gives training to tank crew officers for the Armed Forces of Ukraine and promote its further progress.

### ***Research School Activities***

The research papers written by the scientists of the University are targeted at the innovational development of the country. New technologies are developed for the contemporary industry.

About 40 scientific schools work for the University. These are involved in fundamental and applied research in the field of mechanics, physics, nanotechnologies and nanomaterials, tank construction and contemporary armament, power engineering and transport, electric generators, electronics and electrical engineering, turbine building and tractor construction, chemical and food technologies, IT-technologies and telecommunications, economics, etc.

More than 1,700 teachers and 600 scientists participate in the research done; among them are 37 honored science and technology workers and 33 State Prize winners.

The research done in 2014 was highlighted in 5,427 scientific papers; 4,802 of these scientific papers were published in professional journals and 584 were published in international journals abroad.

The coauthors of more than 1,203 published scientific papers were students and 397 scientific papers were written by the students.

Annually the sixteen special academic councils welcome the scientists to defend 10 to 14 theses for the doctor's degree and 62 to 67 theses for the PhD degree.

Over the last three years the scientists were given four State Prizes in the field of science and technology and two State Prizes were given to young scientists.

### ***International Activities***

The University established close creative relations with more than 120 universities of the world that allow it to integrate into the worldwide scientific and educational space.

Like other foreign universities, NTU "KPI" is given European and Universal Grants TEMPUS, TESIS, DAD, NATO, and Erasmus that amount to 2-2,5 million EUR.

Annually, these grants provide an opportunity for 75 teachers and 80 to 100 students to go to foreign universities to get an education, practical training or participate in scientific conferences and/or take the study course. Annually, about 15 to 20 professors from foreign Universities work for our University.

Today the University gives training to more than 2000 foreign students, including 110 students at the preparatory faculty.

### ***Financial and Economic Activities***

Over the last years the University paid out and continues to pay out the scholarships and salaries and provides social welfare for the students and teachers. The resource base of the campus and hostels is continuously developing and the appropriate financing is provided to promote the activities of these structures.

In 2011 -2012 the investments were allocated in amount of 50 million UAH to modernize two hostels No2 and No3 to the level of a hotel type.

The construction of the fundamental scientific library for 1.5 million tomes has been completed.

The sources of funding are represented by public funds and special-purpose funds (payment for the education) and the funds earned by university departments.

## **Strategic Orientations of the University Development until 2025.**

### *In the field of education*

The main task is to improve the quality of education to bring it up to the world level by updating the education content, communicating extensive knowledge and implementing contemporary technologies. The international accreditation of academic programs is also of great importance, including the updated material resources and the professional development of teachers.

The development of the University is possible, when the Law of Ukraine “On Higher Education” is observed and new specialties and education standards, including the programs on educational activities and education are introduced and realized.

To facilitate the progress the University will make use of the advantages of academic, scientific and financial self-government of the university and create the internal system that guarantees the high-quality training for candidates working towards their bachelor’s, master’s and PhD degrees.

In the nearest future we will create a new system of training in principle based on innovative academic plans worked out for 40 specialties and 157 specializations to lessen a load carried by students and teachers and reduce the number of disciplines taught during the semester.

The educational process is carried out on the basis of a continuous change in the content of education due to giving new knowledge needed for the development of special contemporary competence of an appropriate level.

The University also plans to provide the international accreditation of academic programs to internationalize the training of specialists.

One more task is to develop creative relations with the employers by setting up educational, scientific and industrial clusters, and initiating the dual education and governmental and private partnership.

To improve the knowledge of English the appropriate scope of credits should be included into new academic plans adopted by the Conception prepared by the British Council.

On reaching agreement with the Ministry of Defense, the military department of the University will be converted into the Armored Machinery Institute.

A program will be worked out to create the contemporary system of raising the level of the skills of teachers, scientists and the pedagogical staff.

We also plan to create the system of criteria to evaluate the competence level of students in a certain area as an outcome of their leaning.

### *In the field of science*

Our tasks are as follows:

- promoting the development of 40 scientific schools of the university and also Research Institutes “Molniya” and “Ionosphere”;
- working towards an increase in the amount of research papers by making use of governmental funds and those of industrial companies and firms;
- Increasing the amount of scientific papers by making use of international grants (“Horizon 2020”, TEMPUS, and TESIS).
- Involving the departments into modern armament research and developments (tanks, armored troop-carriers, missile equipment and electronic weaponry).
- Supporting the research done in the field of nanotechnologies, “green” chemistry, information technologies, physics, and mechanics. Special attention will be paid to scientific work done in the field of power engineering and the energy efficiency, including power-consuming technologies and industries.
  - giving priority to scientific papers in the field of medicine, medical equipment, pharmacy, aerospace equipment and electronics.
  - Reorganizing the training of highly skilled staff, in particular philosophy doctors and doctors of sciences.

To raise our scientific developments to higher levels of the worldwide recognition the university intends to work towards the publication of scientific papers in well-known world publications and scientometric bases.

The University is going to participate in the domestic and world rankings of the institutions of higher education;

The specialties in which the PhDs and doctors of sciences are trained will be accredited.

The research that resulted in important scientific data will be nominated for the State Prizes of Ukraine.

### *In the field of staff policy*

Increasing the contingent of postgraduate students at the University with the opportune defense of their thesis;

Involving the teachers and students into participation in the research work;

Planning the share of scientific work done by the teachers according to their individual plans;

The STAFF program will be resumed to provide an opportunity for just-defended doctors of sciences to join academic staff according to their specialty.

Creating the efficient system for raising the level of skills by teachers, scientists and the pedagogical staff;

Promoting the work on probation for the teachers of the University at the world institutions of higher education;

Providing an opportunity for learning foreign languages by the teachers for them to make use of the opportunities of international mobility and give lectures in foreign languages both to Ukrainian and foreign students;

Inviting top-level professors to participate in the educational process;

Maintaining the appropriate scientific level of academics to provide high-quality training for the future specialists and meet the requirements set to the accreditation of specialties;

The number of scientists that work for the departments and research institutes will be preserved to do research for the university.

### ***In the field of methodical work***

Using contemporary pedagogical and methodical technologies, the academic freedoms of teachers and the technical aids of learning in order to improve the training quality of future specialists;

Developing the “Manual” program to publish the methodical literature according to a new list of specialties;

Developing the program of work with young teachers to raise their scientific and pedagogical level contributing thus to the stable development of the University;

Developing an efficient system for raising the level of skills of the teachers, scientists and the pedagogical staff;

Holding on regular basis round tables, discussion seminars and scientific conferences on the problems related to the methods of teaching the subjects, raising the level of competence, skills and abilities in students;

Binding the scientific section and academic council to establish continuous control over the organization of education process to raise the level of methodical and scientific work;

### ***In the field of information technologies***

Promoting the training and research in the field of contemporary and traditional branch of information technologies according to a new list of specialties;

Facilitating the development of the center that maintains the operation of comprehensive educational, scientific, computing and informational system of Ukraine URAN;

Continuing the creation of computer-equipped classes in cooperation with IT companies at the department for computer and information technologies and the informatics and management departments;

Making use of international programs to share the international experience in the field of IT -technologies for the educational process and science;

Making use of information technologies, telecommunication technologies, eLearning and distance learning for the educational process;

The wireless Wi-Fi network will be created to cover the educational and administrative buildings of the University and students’ hostels.

### ***In the field of international activities***

The main task of the international cooperation is to facilitate the further conversion of NTU “KPI” into the world-level University recognized by the world education environment on the basis of the internalization of the main areas of activities, and first of all the academic programs used by the University to educate students and also to provide the mobility of teachers and students and facilitate their participation in international programs and projects.

Providing the access to the information and the access for foreign partners and students to the university;

Working towards the setting up of joint subsidiaries, representations, programs and innovative centers in cooperation with foreign partners;

Developing the cooperation with foreign partner institutions of higher education on dual-diploma programs;

Carrying out the development, implementation and licensing of educational programs, in particular those for the master’s degree with the participation of international partner institutions of higher education;

Enhancing the cooperation with the embassies of foreign countries to solve the problems of more intensive training of foreign students, and the cultural, scientific and academic exchange of students and teachers of the University;

### ***In the field of the development of material resources or the logistics***

Material resources of the University are one of the key tools that can improve the quality of training the specialists and create appropriate conditions for their living and cultural leisure time.

Developing material resources in the nearest time by doing major repair works for educational buildings, auditoriums, department laboratories, campus territories and hostels;

Continuing to equip reading halls with computers to provide more opportunities for the students, teachers and postgraduates and create appropriate conditions for them;

Maintaining the tradition of students to move from one building to another to attend lectures given by different departments, special attention should be paid to the improvement of foot-paths.

On completing the reconstruction of the hostel No2 we plan to launch the following repair jobs that would contribute to the improvement of the living conditions of students at university hostels.

Forty eight university buildings will be reconstructed to increase their energy efficiency according to the programs of European Investment Bank and the Ministry of Science and Education of Ukraine.

Renovating the material resources of departments, laboratories and institutes;

### *In the field of education, popular sport and social welfare*

Developing in students the values peculiar for the intellectuals by way of their patriotic education to contribute to their moral and cultural development, social activities, instill the sense of responsibility and the sound way of life;

The mass work done at the University must contribute to the esthetic education of students, instilling aptitude for sports in them and creating conditions for the realization of their talents for music, choreography and sport.

The educational work with regard to the teachers and employees should be focused on the development of partnership relations between the teachers and students, and the maintenance of creative atmosphere in the team.

Measures should be taken to provide social protection for students and teachers by paying out the scholarships and salaries, render material assistance, create appropriate conditions for carrying out the educational process, doing research and provide comfortable living conditions for the students at hostels.

The efforts must be taken to contribute to the development of student self-government by providing appropriate conditions and involving the students in the work of a different kind done by the University and the Academic Council.

### *In the field of financing university activities*

The strategy targeted at the financing of university activities should be focused on the preservation and development of scientific schools, pedagogical staff and material resources as a base for the high-quality training of the future generations of specialists for Ukraine.

Financial funds should be allocated to meet the demands of students, teachers and employees and provide their social welfare.

The financing strategy also provides for the allocation of funds to provide material and technical opportunities for the procurement of state-of-the-art equipment and improvement of educational process.

The budget items should be planned to provide the material aid for the students and sportsmen, maintain the mass-media support system, including the publishing of books and manuals.

The strategy includes the plan for the extension of the sources of financing, increasing thus the amount of incoming funds. The sources of financing include budgeting funds, special funds, and financial inflows to the account on the instruction, the investments provided by the graduates to develop the university, charitable contributions and the donated equipment.

## **University Development Program in 2016 through 2025.**

A goal of the development of the university throughout the period of 2016 to 2025 is to provide the innovation breakthrough to a qualitatively new level of scientific

and educational activities on the grounds of further exposure of the research potential reaching at most the indicators of world universities and creating the conditions for being among 500 of the best universities of the world.

To achieve this goal the programs provides for the following:

- combing the fundamental research, high-quality teaching activities, information technologies and state-of-the-art equipment accompanied by the internalization and renovation of the content of education and the creative educational work;
- embodying the values of free scientific thinking and developing the pedagogical approach to any type of activities and the tolerance as well;

***Improving the educational process, the organization and supervision of it***

1. For this purpose we plan to do the following:

- creating the education and methodology management system;
- creating the computer-aided control and document circulation system on the base of the Center for Information technology;
- improving the management system of the University to meet the requirements of the current anticorruption legislation;
- introducing new educational conceptions and multilevel academic plans to the educational process;
- new academic programs related to the research, professional training and career must be developed to train the postgraduates for the master’s degree;
- increasing the efficiency of practical work done by students at the industries;
- A new program will be developed for the University “Announcements on the Requirements to the Qualifications of Higher Education” in cooperation with the employers.

2. Improving the pedagogical technique of scientific and pedagogical staff;

To achieve this goal it is nessesary to:

- continuously develop the current system of the improvement of pedagogical technique by the teachers;
- improve academic programs, the content and the methods of teaching;

Table 1. Until 2025 the following education development figures should be attained;

No	Description	Years				
		2016	2018	2020	2023	2025
1	Number of training areas	19	19	20	20	21
2	Number of training specialties	40	42	43	44	45
3	Number of training specializations	157	160	162	163	165

4	Matriculation to the University					
	-bachelors	1850	1900	1920	1940	1950
	-masters	825	1500	1560	1700	1720
	-specialists	665	-	-	-	-
5	The Graduates:					
	- bachelors	2332	1850	1905	1910	1920
	- masters	938	958	970	1450	1570
	- specialists	1749	628	-	-	-
6	Honors Diplomas		47%	48%	49%	50%
7	Number of students	15986				
8	Total number of teachers	1743	1765	1790	1810	1820
	- doctors of sciences	218	220	220	230	240
	- PhDs	872	895	920	930	950
9	Employment (%)	96	96	97	97	97
10	Number of Olympics winners	29	30	32	34	35
11	Number of departments	95	95	95	95	96

- promoting “the School for Young Teachers” to develop their theoretical, pedagogical and methodical knowledge;
- increasing the number of methodical seminars and extend their content by sharing Ukrainian and world experience.

3. Making use of information and communication technologies:

The University will implement the conception of the development of eLearning for the period of 2016 through 2020 that includes the “Electronic Educational Resources” project and such projects as “Multimedia shop”, “Fast Assistant in Education”, “Educational Electronic Space”, etc;

- the University will work for the procurement of the material and literature to assist students in their independently-done scientific work and to provide opportunities for the students to continuously use information technologies and the Internet;

4. Intensifying the educational process and mobilizing the students by learning.

This involves the use of:

- problem approach to the learning;
- conversion of the hands-on learning into the “proficient” learning;
- master-classes given by the representatives of companies and firms;
- broad implementation of role-playing and business games;
- realization of integrated yearly projects in cooperation with adjacent departments, including those of other institutions of higher education.

Table 2. Extending eLearning resources by 2025;

No	Description	Years				
		2016	2018	2020	2023	2025

1	Number of computer-equipped classes	100	120	140	1260	200
2	Teachers providing distance eLearning	300	310	320	330	350
3	Number of distance courses	350	380	420	480	500
4	Full-text eLearning resources base	1870	1900	2200	2500	3000
5	Virtual laboratory tests	27	30	85	140	250

5. Providing educational and methodical literature for the educational process for the period of 2016 to 2025;

- the “Manual” program should be worked out for the period of 2016 through 2020;
- a new system “Academic Council Classification” should be implemented by the University;
- thirty to forty manuals and textbooks are planned to be annually published to provide new areas for science, technology, disciplines and new academic plans; Material resources of the publishing center are to be renovated.

#### 6. Educational Process Test System

A contemporary level of the organization of educational process sets new requirements to the test system of knowledge gained by students including the evaluation of the level of competence of students involved in specific studies;

- the test system will pay special attention to the e-text development and the use of e-texts;
- rectorial tests will be carried out;
- computer testing will be done;
- written test papers will be submitted;
- more attention will be paid to the comprehensive exams in specialty.

7. Creating the System of Internal Guarantees of the appropriate quality of higher education, providing the publicity and transparency (2016-2017)

8. In 2016 a new generation of academic plans will be created and introduced according to the Law “On Higher Education” that are intended for the development of a certain competence in the graduates of the University.

9. Academic load of teachers will be reduced to 600 hours a year and 24 hours a week for students (2016).

10. The students and teachers will have a continuous access to new specialties and specializations in contemporary fields of knowledge and new technologies (2016 to 2025);

11. The quality of knowledge gained by the specialists will be improved by establishing close relations with the labor market, for this purpose educational, scientific and industrial clusters must be set up (2016-2018).

12. The students’ self-government must allow the students to participate annually in the educational process management through the participation in the work done by dean’s offices, academic councils and methodical committees

13. The work should be done to develop integral academic plans for the Kharkiv Computer Technology College and Poltava Polytechnic College (2016 through 2017).

14. When working out academic plans NTU “KPI” will pay special attention to the improvement of fundamental theoretical training and the introduction of zero programs in mathematics, physics, chemistry and informatics for first-year students according to the secondary school curricula.

15. The military department will be converted into the Armored Machinery Institute to give more intense training to the officers that acquire new professions that are of importance for Armed Forces (2016-2018).

16. The laboratory base of the department will be renovated throughout the period of 2016 to 2025 and the procurement of computers is the part of this project.

17. When working out new academic plans, the list of disciplines will be renewed by 10 to 15 %; new disciplines highlighting new materials, state-of –the-art design methods, nanotechnologies, contemporary information technologies, energy saving, stable technology structure in mechanical engineering and nanocatalytic processes in the chemical technology will be included (2016 to 2020).

18. The number of disciplines of the students’ choice should be increased by 25 % in new academic plans.

***A new generation of teachers-researchers should be trained to improve the quality of higher education.***

To form a qualitatively new generation of teachers-researchers the scientific and engineering knowledge, contemporary technologies and the methods of education of the world level must be given to them. This provides for:

1. Giving a stimulus to the creative activity of the teachers through their participation in research, defense of PhD thesis and thesis for the degree of the doctor of sciences, taking the postgraduate courses and the course of studies at the institution of doctoral candidacy, and taking creative holidays.

2. Initiating new forms, in particular taking the training course at industrial plants, raising the level of pedagogical art, taking the courses in foreign languages and the training courses abroad.

3. Working out a new approach to a refresher training of teachers that will only be provided with work being discontinued.

4. Training the reserve of young teachers that will be able to hold executive positions and the academic program should be worked out for their training and practical support in 2016.

5. Taking every effort to preserve the faculty staff and raise their scientific level; the average age should be reduced to 47 (2019).

6. Encouraging the teachers to write the textbooks and manuals by paying the remuneration in amount of 2,000 and 1,000 UAH, accordingly.

7. To give impetus to the preparation and defense of the thesis for a doctor’s degree the remuneration for this work will be increased to 5 thousand UAH and the PhD thesis will be remunerated in amount of 1.5 thousand UAH.

8. For the period of taking the training course by a teacher, its teaching load will be shifted onto the teachers that have 0.25 wage rate with the payment of rectorial bonuses.
9. Encouraging the teachers to make use of foreign languages as a basis for the high-quality teaching and taking training courses abroad by paying them a 10% bonus in addition to their salary.
10. Setting higher requirements to the training and educational work done by the teachers for students to provide a high level of knowledge for them and educate them as the true patriots of Ukraine with an appropriate level of the respect of the honor, rights and liberties of a person.

### ***Methodical Support of the Educational Process***

1. Giving consideration and providing support for the new generation of academic plans throughout the period of 2016 to 2020.
2. Reviewing the content of academic programs related to the disciplines, curricula, and renovating them taking into account the contemporary achievements in science and technology to achieve an appropriate level of competence in students.
3. Giving an impetus to the publishing of methodical literature for full-time and correspondence students.
4. Developing a new program titled “The Manual” to publish textbooks, manuals and the methodical literature, including those in English.
5. Setting up a section with the Methodical Council, authorized to evaluate the manuscripts submitted to get a classification of a textbook or manual based on previous reviews.
6. Providing the electronic methodical support for the distance training and eLearning, including virtual laboratory tests.
7. Starting from 2016 the procurement of periodicals, scientific and educational literature for the university library in the amount of 350 to 400 thousand UAH a year must be renewed.
8. Printing the methodical literature to sell at the bookstalls of the University.

### ***Developing IT-technologies***

1. Working out the program on the renovation of material resources and licensed software for the departments and laboratories.
2. Sending abroad the students, postgraduate students and the science and pedagogy employees engaged in the IT-branch to take training courses.
3. Involving the specialists of IT-industry in the development of academic plans and programs.
4. Promoting the practice of dual training together with IT-companies.
5. Continuing the promotion of eLearning and the distance training, in particular:

- creating a total system of eLearning with the participation of all structural subdivisions
- giving an impetus to the development of the distributed system of consulting centers for distance training;
- realizing the quality control system for electronic academic programs and methodical aids;
- providing the implementation of all the electronic components of educational and methodical system in the common information-&-education environment;
- When establishing contacts with IT-companies the opportunities of the governmental and private partnership should be used.

### ***Research Development***

An important task of the research university is to provide the integration of science and education.

The main tasks of scientific and innovative activities are set forth in the legislation of Ukraine (the Law of Ukraine “On Higher Education”, “On Scientific and Engineering Activities”), normative acts (the Decree of the Ministry of Education and Science of Ukraine No535 of 07.06. 2011), the Program on the Activities of the Cabinet of Ministers of Ukraine, the strategy for the stable development (Ukraine 2020) and the strategy for the development of high-tech branches until 2025.

The main tasks of the University with regard to scientific and innovative activities are as follows:

- doing the fundamental and applied research in the priority areas of the development of science and technology, developing and creating new equipment, technologies and materials, in principle.
- making an efficient use of the scientific potential of teams involved in the solution of scientific and scientific-&-engineering problems related to the development of the economy in Ukraine;
- promoting scientific-&- engineering products to the world market, participating in the realization of international scientific-&-engineering programs, in particular the framework program “Horizon 2020” and others;
- realizing innovative programs targeted at training the scientific and pedagogical staff for the Universities, scientific institutions and science-intensive productions;
- creating favourable conditions for the efficient use of the data of fundamental and applied research for the educational process, especially when writing and improving the courses of lectures, manuals and textbooks;
- encouraging the scientific-&-engineering creative work of the employees and students of the University;
- setting up the shared centers;
- renovating material resources of the research base;

- providing pay services by scientific, scientific-&-research, research-&-design and RD subdivisions of the University;
- providing the marketing support, informational and patent-licensing support for scientific activities, the standardization and metrology support for scientific and engineering products in compliance with international norms;
- organizing informational, advertising and publishing activities, advocating the achievements of the scientists of the University through the mass media, monographs and scientific papers, exhibitions, trade fairs, auctions, etc.
- manufacturing the test specimens and small sets of science-intensive products;
- improving the quality of the organization of scientific activities at the University by offering training courses conducted worldwide for the managers of scientific sections at the leading institutions of higher education
- doing the fundamental and applied research in specific priority-driven areas of scientific, scientific-&-engineering and innovative activities in cooperation with the National Academy of Sciences and Branch Academies of Sciences to jointly resolve important scientific-& engineering tasks;
- setting up joint scientific centers and other associations to realize research programs in cooperation with foreign partners;
- setting up economic associations for the purpose of commercialization of the objects of the right of intellectual property;
- manufacturing and realizing the operative embodiments of new equipment, technologies, and small sets of science-intensive products;
- creating the conditions for the exchange of students, postgraduate students, doctors, scientists and the pedagogical staff;
- providing the participation of students in scientific investigations and engineering research, applying the obtained research data in practice as an inseparable part of the educational process, and also the participation of students in the competitions of scientific papers;
- training and retraining the personnel of a top qualification, and offering the courses of advanced studies for the specialists engaged in the economy;
- raising the level of skills of the employees of companies, institutions and organizations that make use of the data of applied research obtained by the University;
- realizing the innovative projects on the development, implementation and production of new high-tech products;
- working towards the integration of education and science with production by setting up educational, scientific and industrial associations, basic departments and laboratories in cooperation with the National Academy of Sciences and branch academies of sciences, companies, institutions and organizations;
- providing the security for the objects of the right of intellectual property, in particular the innovative developments of the University;
- participating in the realization of international projects and programs, scientific and practical conferences, seminars and exhibitions;

- developing the scientific fleet and the infrastructure of it;
- publishing the research data;
- encouraging the interdepartmental scientific and engineering activities and making use of the opportunities provided by the Centers for the shared use of research equipment;
- publishing scientific papers in the editions that are the part of international scientometric databases, providing the inclusion of the bulletins and scientific journals of the University into International scientometric databases.

Table 3. Development of the research until 2025.

No	Description	Years				
		2016	2018	2020	2023	2025
1	Fundamental science: number of the subjects	23	25	28	30	32
	Funds, thousand UAH.	7200	8000	9000	10000	11000
2	Applied science: number of the subjects	26	30	35	40	42
	Funds, thousand UAH	9000	1000	12000	15000	17000
3	Number of economic contractual subjects, thousand UAH	130 1600	5800	7000	8000	11000
4	Number of the publications	4560	5000	520	560	6000
5	Number of SCOPUS publications	2065	2200	2300	2400	2500
6	Number of joint publications done with participaton of students	1203	1250	1300	1350	1400
7	Number of students' publications	397	420	450	500	600
8	Number of the patents	87	90	95	100	120
9	Participation in the exhibitions	7	8	9	9	10
10	State Prizes	1	1	1	1	1
11	Number of staff scientists	420	430	440	450	460
12	Number of the teachers, participating in scientific work	1200	1250	1300	1350	1400
13	Number of the students, participating in scientific work	5100	5300	5600	5700	5800

### *International Activities of the University*

International activities of the University are carried out to assist NTU “KPI” in the achievement of the world level, and a high competitive ability in the world market of education services, the international recognition of academic programs and education documents.

1. To internationalize education and scientific activities of the University in the nearest future it is necessary to do the following:
  - carrying out the international accreditation of academic programs;

- harmonizing the education content of the University with the world education society;
- enhancing the practices of the credit mobility of students as it is done in the countries with a high level of engineering and technology;
- enhancing the cooperation with foreign universities to provide dual diplomas for students;
- to increase the scientific and methodical level of teachers the University will promote the practice of in-depth study courses abroad and;
- invite the key professors of foreign universities to participate in the educational and scientific work of the departments;

Table 4. The task is to achieve the following figures in international activities through 2025.

No	Description of the events	Years				
		2016	2018	2020	2023	2025
1	Number of international contracts	130	140	160	180	200
2	International grants	5	7	12	16	20
3	Affiliated education of the students	30	60	90	180	250
4	In-depth training courses abroad for the teachers and postgraduates	20	30	40	45	50
5	Participation in international conferences	30	45	60	85	100
6	Publishing generic manuals and monographs	1	2	4	7	10
7	Preparing “dual diplomas”	3	10	20	50	100
8	Inviting foreign professors	15	20	25	28	30

2. Inviting the European Netvec Quality Education Organization to provide the European certification of the quality of educational services provided by the University (2015 to 2018).
3. To increase the number of international grants it is necessary to intensify the work of scientific and international departments on the submission of projects related to such programs as “Horizon 2020”, TEMPUS, TASIS, ERASMUS, DAD, NATO, and the projects announced by the USA, Germany, Switzerland, Norway and Sweden.
4. Encouraging foreign students from Turkey, Iraq, Georgia, Azerbaijan, Israel and other countries to study at the University. The University plans to increase the number of foreign students to 2,500 persons until 2025, including about 150 persons at the preparatory department.
5. To provide the mobility of students and teachers the representations of the British Council, Goete Institute, French Alliance, etc will be set up at the University.
6. Inviting annually key professors from foreign universities to give lectures on the contemporary problems of science and education, and writing generic scientific papers.

7. Involving annually the key professors of the University in pedagogical and scientific work.
8. Contributing to the implementation of the data of scientific, engineering and technological developments of the departments and research institutes “Molniya” and “Ionosphere”
9. Inviting annually foreign students to participate in educational and scientific programs for the PhD degree (50 persons annually)
10. Developing the program on methodical and organizational arrangements targeted at the improvement of the quality of training of foreign students (2016 to 2017)
11. Increasing the number of tutorials, the published texts of lectures and the methodical literature in English and Ukrainian.
12. Informing continuously the embassies and consulates of foreign countries on the education of their citizens at the University (annually).
13. To improve the academic and educational work among foreign students, joint mass-cultural and sporting arrangements will be held for Ukrainian and foreign students.
14. Improving annually the living conditions for foreign students at hostels.

### ***Improving the Training of Foreign Students***

An efficient work should be done to arouse interest in foreign citizens in the studies at our University, participating in the programs for bachelor's degree and master's degree and taking the postgraduate course.

1. Increasing gradually the number of foreign students to 2,500 persons and 150 persons at the preparatory department.
2. Inviting foreign students to study at all university departments.
3. Working out the plan of arrangements held to improve the education quality for foreign students by increasing the number of lecturing courses and methodical literature on electronic carriers.
4. Raising the level of the individual work of teachers with foreign students.
5. Holding joint mass-cultural and sporting arrangements for Ukrainian and foreign students.
6. Improving the living conditions of foreign students at the hostels and the quality of their meals.

### ***Educational Work***

Educational work is an important factor of an improvement of the quality of training the specialists that are the patriots of Ukraine.

The educational work is to be focused on the development of many-sided personality in students by way of patriotic, moral and mental education to consolidate moral and cultural values, social activities and the healthy life-style.

1. During the education the University will combine training and educational procedures using the individual and mass forms of education.

2. Making an efficient use of the opportunities provided for the educational work by the Palace of Students, Sport Center and the fundamental Scientific Library.
3. The educational work done by the teachers should be targeted at the maintenance of creative tolerant atmosphere at the University, and the responsibility for the quality of education and training given to the students;
4. Involving the students into the participation in the student self-government and trade unions to contribute to the educational work of students, taking different courses and studying in the different groups of the department.
5. Using efficiently the opportunities provided by the "Polytechnic" newspaper to inform the staff of the University on the orientations and the results of educational work.
6. Using efficiently such forms of activities as "the Best Singer" contests, the best group of amateur art performances, the best hostel, etc.
7. To make the managerial work of senior students more efficient with regard to the educational process the datebooks should be introduced.
8. The conditions for the efficient work of student self-government and trade unions should be created, taking into consideration material and managerial aspects.
9. The meetings with senior students should be held each semester to discuss the vital issues of the organization of the training of students and doing the educational work.
10. Making the work of teachers at the hostels more efficient.

### *Activities of the Palace of Students*

1. Resuming the work of the Artistic Council at the Palace of Students.
2. Striving for an increase in the number of the circles involved in amateur art performances, inviting talented students to participate in them.
3. Working out the plan for the development of the Palace of Students, artistic creative work and the resource base.
4. Promoting the groups involved in amateur art performances to confer on them the titles of national.
5. Holding competitions, amateur performance nights at the departments, attending the creative parties arranged by the circles of amateur art performances and folk groups.
6. Providing a comprehensive support for the managers of amateur art performances in their efforts to participate in appropriate contests including those held abroad.
7. Resuming the work of brass band at the Palace of Students.
8. Working out the program for the renewal of music instruments and stage suits.
9. Arranging regularly international nights with the participation of foreign students.

### *Promoting the Popular Sport*

Opportunities of diversified logistics of the sport center, the experience of teachers and the service personnel must be used more efficiently to improve the quality of popular sport, coaching and professional sport at the University.

1. Increasing the number of students from different departments that participate in the university sports contests, in particular 22 types of sports.
2. Working out the physical culture curricula for the first-year through fourth-year students. Planning for this work at least 12 credits in special-subject curricula used for the training of specialists.
3. Involving the sport center in the vocational guidance provided by the University.
4. Enhancing the activities to attain high sport achievements, increasing the number of the participants of Ukrainian and International contests, and the masters of sport.
5. Encouraging the teachers that have a title of the master of sport to work on their PhD and doctor's theses and defend the theses.
6. Prividing the financial support for the sportsmen that uphold the honor of the University and the State, participating in the world, European and Ukrainian contests.
7. Encouraging the pupils with high acievements in sports to enter the University.

Table 5. Raising the level of work done to promote education and popular sport on the grounds of the arrangements held.

No	Description	Years				
		2016	2018	2020	2023	2025
<b>Physical Training Department</b>						
1	Increasing the number of students participating in the University sport contests in 22 kinds of sport	3100	3300	3400	3500	3700
2	Participation of students in the contests in Ukraine	230	250	260	270	280
3	Participation of students in international contests					
4	Winnining the medals in international contests					
	Gold medals	2	2	3	3	4
	Silver	1	2	3	4	5
	Bronze	8	9	10	11	12
5	Complying with the norms provided for the master of sport: Master of sport	9	10	11	12	13
	Master of sport of an international class	1	1	2	2	2

Palace of Students:						
6	Increasing the number of the participants of amateur art performances	700	750	800	850	900
7	Number of amateur art circles	20	21	22	23	24
8	Winners of Ukrainian contests	17	17	18	19	20
	International contests	6	7	8	9	10
9	Folk circles	5	6	6	7	7

### ***Enhancing the role of student self-government in University activities***

To observe the Law of Ukraine “On Higher Education” the conditions should be provided for the activities of student self-government, including the execution of invested authorities and the participation in all the areas of work done by the University.

1. Involving the representatives of student self-government in the activities of academic councils, enrollment boards, and dean’s offices.
2. Involving vigorously the student self-government in the work done to organize the educational process and improve the content of higher education.
3. According to the law of Ukraine material resources in amount of 0,5 % of the budget funds of the University should annually be provided for the functioning of student self-government.
4. The appointment of chiefs to take up executive positions provided for by the law “On Higher Education” should be coordinated with the student self-government.
5. Working out the curricula and doing major repair jobs at the hostels should be coordinated with the student self-government.
6. Planning annually the funds for business trips, material aid and the bonuses given to students.
7. Setting up student self-government bodies at University hostels to organize the educational work.
8. Working together with the student self-government to involve students in the participation in scientific circles.

### ***Financial Strategy for Further Development of the University***

The main goals of the strategy for financing University activities is to retain and develop the human potential of scientific schools, the material and technical base, the research done, develop international relations and carry out the training of the future generation of specialists.

Table 6. Forecast for the funding of University activities throughout the period of 2016 to 2025, making use of the funds brought in by basic activities and those provided by the special-purpose fund (thousand UAH)

No	Description	Years				
		2016	2018	2020	2023	2025
Basic activities						
1	NTU “KPI”	280537	284537	288537	292537	296537
2	“MOLNIYA”	2540,8	2640,8	2740,8	2840,8	2940,8
3	MIPO					
4	Chernivetskyi Department					
5	Computer Technology College	13835	14035	14235	14435	14635
	Total	296314				314112
Special Fund						
1	NTU “KPI”	133674	137674	141674	145674	149674
2	“MOLNIYA”	1961	2061	2161	2261	2361
3	MIPO	3899	3999	4099	4199	4299
4	Chernivetskyi Department	1955	2055	2155	2255	2355
5	Computer Technology College	1960	2060	2160	2260	2360
	Total	143450				161091

1. The subdivisions of the University will take an active part in the work done to increase an amount of earnings for the special- purpose fund due to international grants, increase the number of foreign and Ukrainian students that study on contractual basis, and also investment contributions done by University graduates.
2. The departments and laboratories will carry out the certification of the products produced by the engineering industry, food and chemical industries, and also by the power supply and power generation industry.
3. The departments and laboratories will set up and provide the refresher courses for the employees of different branches of industry.
4. Financial arrivals required for the development of the logistics of departments will be received due to the promotion of governmental and private partnership and leasing programs.
5. The obtained financial resources will be allocated to meet the demands of students, teachers, and scientists for the social welfare and improve labor conditions;
6. Optimal planning of financial resources would provide the timely payment of salaries, scholarships and health improvement funds.
7. The funds required for the funding of the activities of student self-government in amount of 0,5% of the funds of the University must be planned.
8. To improve the quality of pedagogical activities maximum bonuses to official salaries should be planned (for the candidate of sciences -15% bonus, for the associate professor – 25% bonus, and for the doctor of sciences – 35% bonus).
9. The bonuses in amount of 20% will be paid out to the pedagogical service personnel.

10. The bonuses in amount of 10 to 30% will be paid for long service and 20% for the title of “Honored” Worker.
11. The funds for the awards, doctoral bonuses and the material aid will be provided on the assumption of waging fund savings.
12. To encourage the opportune fulfillment of important work, provided that the vacancies are available, additional payments should be effected in amount of 50% of the salary for the expansion of the service zone or doing two works at the same time at the University.
13. The funds will be provided to contribute to the formation of the contingent of postgraduate students and young teachers, in particular seventy places for the trainee-teachers have been planned.
14. Rectorial additional payments will be effected to support young teachers that work part-time, or have 0,25 and 0,5 rates of the official salary.
15. Rectorial additional payments will be planned for the heads of amator groups working for the Palace of Students.

### ***Developing the University Logistics in 2016 through 2025***

1. Increasing the energy efficiency of University buildings by providing the heat insulation of the facades with the replacement of windows and heating system, and the modernization of electric supply network system and the water supply system.
2. Doing repair works at 48 university buildings that include academic buildings, administrative buildings, hostels, the palace of students, the sport center and the scientific library. The source of financing is the European Investment Bank. The amount of financing is 3 million EUR for the period of three years (2016, 2017, and 2018).
3. Special funds in amount of 14 to 19 million UAH should be planned by the University to do the capital repair of the University logistics, including the laboratory bases of the departments.
4. Working out the plan for capital repairs of auditoriums, including stand-by auditoriums, 105 auditoriums in the electrobuilding, and chemical building auditoriums.
5. Repairing the reading halls and the facilities of old library in the central auditorium building.
6. Reconditioning the sporting hall in the Vesnina Street.
7. Reconditioning twelve hostels to improve living conditions for students
8. Completing the reconstruction of the hostel No2 to meet the requirements of the European level;
9. Resuming the work of the canteen at the “Gigant” campus.
10. Doing the repair works at the rectorial building.
11. Completing the repair works at the Palace of Students.
12. Working out the plan to repair the footways and pavements of the campus and hostels.

13. Providing the refreshment bars for catering at academic buildings and hostels.
14. Developing the project for the reconstruction of the exposition at the History Museum of University.
15. Equipping the parking lot for motor-cars and bicycles in the campus territory

Table7. University Logistics

No	Description	Quantity	Total area, m <sup>2</sup> .
1	Academic buildings	35	145750
2	Administrative and auxiliary buildings	35	11433,8
3	Scientific, Engineering and Educational Center	10	5275,3
4	“Molniya” Institute	19	23804,2
5	Hostels	15	108052,1
6	Dwelling houses	8	40673,5
7	Sporting health-improving camp “Polytechnic”	50	2619,6
	Total	172	347922

### *Capital Construction*

1. Doing the design work for siting at the village of Figurovka to provide the capital construction of sporting health-improving camp for the recreation of students and teachers.
2. Doing the design work and construction of a contemporary stadium with the track pavement and appropriate premises.
3. Working out the siting project for the ski lodge of the Physical Culture Department at the Forest Park.
4. Working out the projects to reconstruct all heat, water, power and gas supply networks and also communication networks using the funds provided by the European Investment Bank.
5. Erecting the apartment house for the teachers and employees of the University.
6. Completing the repair of exhibition hall in the Palace of Students.

### *Social Welfare of Employees and Students*

1. Providing the opportune payment of scholarships, salaries and holiday and health-improving payments.
2. Paying rectorial bonuses and rewards up to 2 million UAH a year due to wage fund savings.

3. Paying annually welfare allowances to the employees and teachers in the amount of 800 thousand UAH and to the students in the amount of 150 thousand UAH.
4. Providing again an opportunity for students, teachers and their children to enjoy their holiday time at the sporting and health improving camp "Figurovka".
5. Providing fringe benefits for students, employees and teachers so that they could enjoy the services of sporting sections at the Palace of Sport of the University (50% discounts).
6. Giving an opportunity to the teachers and employees to hold additional positions of 0,25 and 0,5 of the official salary due to an increase in the academic loading, broadening the range of services and combine jobs.
7. Concluding opportune contracts with trade union committees to improve the conditions for learning and work in the academic buildings and living conditions at the hostels.
8. Allocating annually the funds in the amount of 300 to 400 thousand UAH to buy overalls and raise the security level of students and teachers during the educational process.

### ***Organizational Arrangements***

1. Setting up the Supervisory Council according to the Law of Ukraine "On Higher Education (2016)
2. Setting up Supervisory Council Commissions (2016)
3. Setting up the Internal Education Quality Securing System (2016-2017)
4. Developing a new generation of academic plans and/or curricula (2016)
5. Establishing the educational and methodical management (2016)
6. Optimizing the University structure on the ground of a new list of specialties and specializations (2016-2017)
7. Creating the paper-free electronic management system for all the branches of University activities (2016 to 2017)
8. Setting up a modern alarm system to provide the University security using the continuous control devices (2016 to 2017).
9. Resolving the problems related to the further development of the departments that are small in number.
10. Developing the rating system for the teachers, departments and schools (2017).

### ***The program was developed to resolve the following problems:***

1. Preserving the stability and creative activities of the University staff.
2. Promoting further development of all the lines of university activities by observing the law of Ukraine "On Higher Education".
3. Improving the quality of training of future specialists to bring it up to the world level based on the Internal Education Quality Ensuring System.
4. Working towards the worldwide recognition of the University to fulfill the provisions of the law of Ukraine "On Higher Education".
5. Promoting the University into European educational and scientific environment.

6. Internationalizing the educational process of the University through the development of international relations and the mobility of students and teachers and the harmonization of academic programs with the key Universities of Europe.
7. Educating the students to be the patriots of Ukraine and highly-skilled specialists.
8. Making a more intensive use of modern IT-technologies and telecommunication systems to promote educational and scientific activities.
9. Providing a high level of competence for the graduates to successfully work in the economic sector of Ukraine.
10. Increasing the funding capacity due to the diversification of funding sources.
11. Updating the logistics of the University to bring it up to the world level by using the funds of European Investment Bank.

Rector Prof. Sokol E.I.

Chairman of the academic council L.L. Tovazhnianskyi

Approved by the Academic Council on January 29, 2016.