

UNESCO CHAIR/UNITWIN NETWORK PROGRESS REPORT FORM

Title of the Chair/Network:	UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the National Technical University of Ukraine "Kyiv Polytechnic Institute" and Educational and Scientific Complex "Institute for Applied System Analysis"
Host Institution:	National Technical University of Ukraine "Kyiv Polytechnic Institute"
Date of establishment of Chair/Network: <i>(mm, yyyy)</i>	December, 1998
Period of activity under report: <i>(mm, yyyy - mm, yyyy)</i>	January, 2015 – December, 2015
Report established by: <i>(name, position)</i>	Prof. Dr. Mykhailo Zgurovsky Chairholder of the UNESCO Chair in Higher Technical Education, System Analysis and Informatics, Rector of the National Technical University of Ukraine "Kyiv Polytechnic Institute", Academician of the National Academy of Sciences of Ukraine

1. Executive Summary:

Major outcomes, results and impact of the Chair, including on national policies, in relation to its objectives as stated in Article 2 of the Chair Agreement (between the Institution and UNESCO)
(Not exceeding 300 words)

International activity of NTUU "KPI" is one of the key directions of the university strategic development. It consists of such basic constituents: preparation of specialists and scientific and academic staff including from foreign countries; cooperation with international educational organizations and funds, participation in a range of programs which are created with the purpose of obtaining grants; exchange of information about scientific publications; participation in conferences, exhibitions, seminars, educational fairs; collaboration with foreign institutions of higher education, including academic and students exchanges.

UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics, which has become one of the brainpower centers of Ukrainian higher technical education, plays an important role in this process. The Chair took the initiative in organizing the international forums, conferences and workshops concerning different aspects of higher education growth and understanding of its importance in modern society.

UNESCO Chair actively facilitated participation of NTUU "KPI" in the most prestigious world university ratings, such as QS University Rankings (EECA), Thomson Reuters and U-Multirank.

In July 2015, NTUU "KPI" took the first place among Ukrainian universities in Webometrics Ranking.

NTUU "KPI" was at the top of the ranking universities in Ukraine III, IV accreditation "Top 200 Ukraine" in 2015.

Another direction of activity of the Chair is the comprehensive support of academic staff, students and PhD of the university in international research and educational programs (FP7, HORIZON 2020, ERASMUS MUNDUS, ERASMUS+, EURASIA, NATO, etc.).

The Chair facilitates the development of innovative ecosystem at the University through participation in international projects on technology transfer and innovative activity. In particular, it takes part in organization and holding of the pan-Ukrainian Innovative Ideas Contest "Sikorsky Challenge".

In 2015, with the active participation of the UNESCO Chair at the NTUU "KPI" were conducted specialized workshops familiarizing scientific community of the University with the aspects of application submission for participation in international programs, creation of consortia, and with experience of world leading universities in this direction.

2) Activities:

Overview of activities undertaken by the Chair during the reporting period

a) Education/Training/Research

(key education programmes and training delivered and research undertaken by the Chair during the reporting period, target group and geographical coverage)

<p>i) Education (leading to certificate)</p>	<p>Students took part in the following activities:</p> <p>1. EU Erasmus Mundus Programme: within the project "Erasmus Mundus European Mobility with Neighbouring ReGion in the East: Ukraine, Moldova, Belarus" (EMERGE), Montpellier 2 University, France.</p> <p>2. EU Erasmus+ Programme, KA 1 jointly with:</p> <ul style="list-style-type: none"> - the Nicolaus Copernicus University in Toruń, Poland; - the Miguel Hernández University of Elche, Spain; - the West Pomeranian University of Technology, Poland.
<p>ii) Training (short term)</p>	<p>There were Information Days for research and educational institutions:</p> <ul style="list-style-type: none"> - Horizon 2020: Work Programme for the period of 2016-2017 in the field of "Information and Communication Technologies" (National Technical University of Ukraine "Kyiv Polytechnic Institute", Ukraine); - Horizon 2020: Work Programme for the period of 2016-2017 (Lviv Polytechnic National University, Ukraine); - Horizon 2020: Work Programme for the period of 2016-2017 in the field of "Climate and Resource Use Efficiency Including Raw Materials" (National Technical University of Ukraine "Kyiv Polytechnic Institute", Ukraine); - Horizon 2020: Work Programme for the period of 2016-2017 (Odessa National Polytechnic University, Ukraine).
	<p>Research staff of the university was involved in:</p>

iii) Research	<p>Project of the EU 7th Framework Programme: “Knowledge Transfer Community to bridge the gap between research, innovation and business creation” (NoGAP), Steinbeis-Europa-Zentrum/ Steinbeis Innovation gGmbH, Germany.</p> <p>Projects of the EU Framework Programme for Research and Innovation Horizon 2020:</p> <p>- “Ukraine Replication, Awareness and INnovation based on EGNSS” (UKRAINE), Valdani Vicari & Associati SRL, Italy;</p> <p>- “Approximation Methods for Molecular Modeling and Diagnosis Tools” (AMMODIT), University of Lübeck, Germany.</p> <p>On the basis of NTUU "KPI" the National Contact Point of the EU Horizon 2020 Framework Programme operates in such fields, as “Information and communication technologies” and “Climate and resource use efficiency including raw materials”.</p> <p>Conferences on the basis of NTUU "KPI" are traditionally held for scientists of universities of Poland and Ukraine universities under the Polish Academy of Sciences (scientific center in Kyiv).</p>
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b) Conferences/Meetings

(key conferences and meetings organized by the Chair or to which its Chairholder contributed)

i) Key conferences and workshops hosted by the Chair

International Seminar “European Engineer Certification: Engineering Card and Assurance of the Educational Quality”

Date and place: 23 April, 2015, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv, Ukraine

Partnership: Ministry of Education and Science of Ukraine, Association of Scientific and Engineering Communities in Ukraine, National Technical University of Ukraine “Kyiv Polytechnic Institute” and Association of the Rectors of Ukrainian Higher Educational Technical Universities, UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the NTUU “KPI” and Institute for Applied System Analysis.

Participants: 150

- Undergraduate students
- Graduate students
- Academics
- Public administrators
- Employees from industry, or other private sector
- Teachers from primary education
- Teachers from secondary education
- Teachers from technical and vocational education

- Other groups

Geographical coverage for participants and partners:

- National
 Regional/Interregional/International

Regions	Countries
Eastern and Central Europe	Ukraine, EU

Publications:

Title: European Engineer Certification: Soon in Ukraine

Publishers: <http://kpi.ua/en/node/10269>

Year of Publication: 23 April, 2015

Type of document/material:

- Book
 Periodical (Newspaper)
 Other – Proceedings of the Conference

Language(s): Ukrainian, English

Keywords: Ukrainian European integration of technical education, the European Federation of Engineering Associations (FEANI), European Network for Accreditation of European Education (ENAE), implementation of European initiatives between relevant Ukrainian and European organizations.

XVI International Scientific Conference Academician Mikhail Kravchuk

Date and place: May 14, 2015, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv, Ukraine.

Partnership: National Technical University of Ukraine “Kyiv Polytechnic Institute”, Institute of Mathematics of the NAS of Ukraine, Kyiv National Taras Shevchenko University, National Pedagogical Dragomanov University, UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the NTUU 'KPI' and Institute for Applied System Analysis.

Participants: 260

- Undergraduate students
 Graduate students
 Academics
 Public administrators
 Employees from industry, or other private sector
 Teachers from primary education
 Teachers from secondary education
 Teachers from technical and vocational education
 Other groups

Geographical coverage for participants and partners:

- National
 Regional/Interregional/International

Regions	Countries
Eastern and Central Europe	Ukraine
Western Europe and North America	USA

Publications:

Title: The opening of the XVI International Conference Academician Mikhail Kravchuk

Publishers: <http://kpi.ua/node/10456>

Year of Publication: May 15, 2015

Type of document/material:

- Book
 Periodical (Newspaper)
 Other – Proceedings of the Conference

Language(s): Ukrainian, English

Keywords: differential and integral equations and their applications; Algebra. Geometry. Mathematical analysis; probability theory; history and methodology of mathematics.

XVI International Scientific and Practical Conference “Renewable Energy and Energy Efficiency of the XXI Century”

Date and place: May 28-29, 2015, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv, Ukraine.

Partnership: National Technical University of Ukraine “Kyiv Polytechnic Institute”, Representative office of the Polish Academy of Sciences in Kyiv, National Academy of Sciences of Ukraine, State Agency on Energy Efficiency and Energy Saving of Ukraine, Scientific and Technical Union of Ukrainian experts and electricians in power engineering, Institute of Renewable Energy at National Academy of Sciences of Ukraine, Inter-Branch Scientific and Technical Center for Wind Power Engineering at NASU, Ukrainian Industrial Wind Power Plants Association, UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the NTUU “KPI” and Institute for Applied System Analysis, Ukrainian-Polish Center of development renewable energy sources and energy efficiency, All-Ukrainian Youth Organization “Green Energy for the Future”, United Nations Industrial Development Organization (UNIDO), EURO SOLAR – Ukraine, Consortium “Eneko”.

Participants: 100

- Undergraduate students
 Graduate students
 Academics

- Public administrators
- Employees from industry, or other private sector
- Teachers from primary education
- Teachers from secondary education
- Teachers from technical and vocational education
- Other groups

Geographical coverage for participants and partners:

- National
- Regional/Interregional/International

Regions	Countries
Africa	
Asia/Pacific	China
Eastern and Central Europe	Ukraine, Poland
Northern Europe	Denmark
Western Europe and North America	Germany

Publications:

Title: "Renewable Energy and Energy Efficiency of the XXI Century" Proceedings of the XVI International Scientific Conference

Publishers: <http://kpi.ua/15-05-28>

Year of Publication: 2015

Type of document/material:

- Book
- Periodical (Newspaper)
- Other – Proceedings of the Conference

Language(s): Ukrainian

Keywords: trends and prospects of renewable energy, electricity and bio-energy resources, hydrogen, geothermal and hydropower, heat problems, especially energy management, technical issues energy generation and energy efficiency.

III International Scientific and Practical Conference "Pure Water. Fundamental, Applied and Industrial Aspects"

Date and place: October 28-30, 2015, National Technical University of Ukraine "Kyiv Polytechnic Institute", Kyiv, Ukraine

Partnerships: The National Technical University of Ukraine "Kyiv Polytechnic Institute", Polish Academy of Sciences, Scientific Center in Kyiv, National Academy of Sciences of Ukraine, Lublin

University of Technology, Society of Ecological Chemistry and Engineering, LLC Technologies of Nature, UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the NTUU "KPI" and Institute for Applied System Analysis.

Participants: 107

- Undergraduate students
- Graduate students
- Academics
- Public administrators
- Employees from industry, or other private sector
- Teachers from primary education
- Teachers from secondary education
- Teachers from technical and vocational education
- Other groups

Geographical coverage for participants and partners:

- National
- Regional/Interregional/International

Regions	Countries
Eastern and Central Europe	Ukraine, Belarus, Poland
Northern Europe	Lithuania

Publications:

Title: "Pure Water. Fundamental, Applied and Industrial Aspects" Proceedings of the III International Scientific and Technical Conference

Publishers: http://wtwst.org.ua/Abstracts_PURE_WATER_2015.pdf

Year of Publication: 2015

Type of document/material:

- Book
- Periodical (Newspaper)
- Other – Proceedings of the Conference

Language(s): Ukrainian, English

Keywords: purification of uranium the regions, iron mining and processing activities; problems of fresh water in the world and Ukraine; methods of desalinization of highly mineralized water; the problems of potable water in evolution world; intensification ways for biological purification of cities and industrial enterprises sewages.

ii) Other conferences/organizational activities undertaken by the Chairholder

III International Scientific Conference "Nonlinear Analysis and Applications"

Date and place: April 1-2, 2015, National Technical University of Ukraine "Kyiv Polytechnic Institute", Kyiv, Ukraine.

Partnership: National Technical University of Ukraine "Kyiv Polytechnic Institute", Institute for Applied System Analysis NTUU "KPI", UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics at the NTUU "KPI".

Participants: 30

- Undergraduate students
- Graduate students
- Academics
- Public administrators
- Employees from industry, or other private sector
- Teachers from primary education
- Teachers from secondary education
- Teachers from technical and vocational education
- Other groups

Geographical coverage for participants and partners:

- National
- Regional/Interregional/International

Regions	Countries
Africa	
Asia/Pacific	Turkey
Eastern and Central Europe	Ukraine, Poland
South East Europe	Republic of Macedonia
Southern Europe	Italy
Western Europe and North America	France, Spain

Publications:

Title: III International Scientific Conference "Nonlinear Analysis and Applications"

Publishers: Kyivsky Polytechnic, No. 14

Year of Publication: April 23, 2015

Type of document/material:

- Book
 Periodical (Newspaper)
 Others – Proceedings of the Conference

Language(s): Ukrainian

Keywords: problems of nonlinear analysis, variational inequalities, differential inclusions, attractors of multivalued mappings and flows, optimal control, decision-making under uncertainty, mathematical modeling of physical and socio-economic systems, as well as the variety of applications of mathematics, mathematical models in various industries.

iii) A selection of conference presentations by the Chairholder and other colleagues

The 35th International Conference “Electronics and Nanotechnologies (ELNANO-2015)”

Date and place: April 21, 2015, National Technical University of Ukraine “Kyiv Polytechnic Institute”, Kyiv, Ukraine.

Partnership: National Technical University of Ukraine “Kyiv Polytechnic Institute”, Institute of Electrical and Electronics Engineers (IEEE), V.Ye. Lashkaryov Institute of Semiconductor Physics of NAS of Ukraine (ISP), National Aviation University, State Enterprise “Research Institute of Microdevices”, STC “Institute for Single Crystals” of NAS of Ukraine.

Participants: 127

- Undergraduate students
 Graduate students
 Academics
 Public administrators
 Employees from industry, or other private sector
 Teachers from primary education
 Teachers from secondary education
 Teachers from technical and vocational education
 Other groups

Geographical coverage for participants and partners:

- National
 Regional/Interregional/International

Regions	Countries
Africa	
Asia/Pacific	Turkey
Eastern and Central Europe	Ukraine, Czech Republic
South Europe	Lithuania
Western Europe and North America	Germany, France, Spain, UK, Belgium, Canada

Publications:

Title: The 35th International Conference “Electronics and Nanotechnologies (ELNANO-2015)”

Publishers: <http://kpi.ua/en/node/10420>

Year of Publication: April 21, 2015

Type of document/material:

- Book
 Periodical (Newspaper)
 Other – Proceedings of the Conference

Language(s): Ukrainian, English

Keywords: micro- and nanoelectronics, biomedical electronics and signal processing, electronic systems.

c) Interuniversity Exchanges/Partnerships

(principal exchanges/partnerships between the Chair and other institution,s including UNESCO Chairs/UNITWIN Networks)

The international student exchange program:

- Master's Programme at the University of Maine, France;
- Master's Programme at the MINES ParisTech, France;
- Master's Programme at the University of Kiel, Germany;
- Master's Programme at the University of Münster, Germany;
- Master's Programme at the Gjøvik University College, Norway;
- Master's Programme at the University of Oslo, Norway.

d) Publications/Multimedia Materials (major publications and teaching/learning materials)			
<i>Please tick relevant fields of output and indicate volume of output:</i>		[tick]	[no.]
	Books	<input type="checkbox"/>	
	Books (edited)	<input checked="" type="checkbox"/>	
	Books (chapters)	<input type="checkbox"/>	
	Monographs	<input type="checkbox"/>	
	Research Reports	<input checked="" type="checkbox"/>	
	Journal Articles (refereed)	<input type="checkbox"/>	
	Conference Proceedings	<input checked="" type="checkbox"/>	
	Occasional Papers	<input checked="" type="checkbox"/>	
	Teaching/Learning Materials	<input type="checkbox"/>	
	Multimedia Materials (CD-Rom)	<input type="checkbox"/>	
	Multimedia Materials (Video)	<input type="checkbox"/>	
	Multimedia Materials (Other)	<input type="checkbox"/>	
<i>Give details of major publications and materials including full citations.</i>			
i) Theses			
1) Title: S.I. Sidorenko. On the Results of the International Activities of the University in 2014 and Objectives for 2015. – P. 2			
Publisher(s): Kyivsky Polytechnic, No.5			
Year: 2015			
Type of document/material: occasional papers			
2) Title: S.M. Shukayev. New Opportunities for Ukrainian Scientists "Horizon 2020". – P. 2			
Publisher(s): Kyivsky Polytechnic, No.13			
Year: 2015			
Type of document/material: article			
ii) Publications			
1) Title: M.Z. Zgurovsky. Kyivan Polytechnics – Pioneers of Aviation, Cosmonautics, Rocket Production. – 338 p.			
Publisher(s): NTUU "KPI"			
Year: 2015			
Type of document/material: book (edited)			

2) Title: M.Z. Zgurovsky. Forsyth Ukraine's Economy: Term (2015–2020 Years) and Long Term (2020–2030 Years) Time Horizons. – 136 p.

Publisher(s): NTUU "KPI"

Year: 2015

Type of document/material: research reports

3) Title: S. Shukayev, S. Kudrya, Y. Lashyna. International Collaboration as a Tool for Intensification the Transfer of Energy Efficient Technologies. – P. 103-105.

Publisher(s): Edelveys

Year: 2015

Type of document/material: conference proceedings

4) Title: S. Shukayev, Y. Lashyna. Experience Transfer Resource-efficient Technologies Through International Projects. – P. 228-229.

Publisher(s): NTUU "KPI"

Year: 2015

Type of document/material: conference proceedings

e) Cooperation with UNESCO Headquarters, Field Offices

Prof. Dr. Mykhailo Zgurovsky is a member of the National Commission of Ukraine for UNESCO under the Ministry of Foreign Affairs of Ukraine.

f) Other

(any other activities to report)

3. Future Plans and Development Prospects:

Outline of action plan for the next biennium and short/medium and long-term development prospects. Please do not hesitate to refer to difficulties that the Chair has experienced (Not exceeding 300 words)

Outline of action plan for the next 4 years:

Further activity of the UNESCO Chair is aimed at implementation of the main trends of the scientific level in order to strengthen the role of the University in Ukraine and other countries.

Activities aimed at increase of the collaboration between experts in the fields of education, science and culture on the national, international and world levels are planned.

Project proposals (terms of reference, applications) will be developed and the search for possibilities of getting grants for educational, research and cultural projects as well as for training, student and academic exchanges will be conducted.

Short development prospects:

UNESCO Chair puts a great emphasis on development of innovation direction of the University, both in educational and research programs. In particular, in 2016 NTUU "KPI" is going to proceed with implementation of the following projects:

- Project under the 7th Framework Programme "Knowledge Transfer Community to bridge the gap between research, innovation and business creation";
- Project under the Horizon 2020 Framework Programme "Ukraine Replication, Awareness and Innovation based on EGNSS".

Forthcoming Activities:

- International Forum "Chernobyl's Legacy for the Nuclear Safety of the World", April 2016;
- XVIII International Scientific and Practical Conference on System Analysis and Information Technology, May 2016;
- XVII International Scientific and Practical Conference "Renewable Energy and Energy Efficiency of the XXI Century", September 2016;
- V Ukrainian Festival of Innovation Projects "Sikorsky Challenge 2016", October 2016;
- IV International Scientific and Technical Conference "Pure Water. Fundamental, Applied and Industrial Aspects", October 2016.

Medium development prospects:

At present, one of the main priorities of the UNESCO Chair is promotion of innovative activity. To achieve this aim the Chair will focus on the following directions:

- organization of the pan-Ukrainian Festival of Innovative Projects "Sikorsky Challenge" in NTUU "KPI";
- preparation of project proposals facilitating the development of innovative activity within such programs, as Horizon 2020, Erasmus+, Visby, USAID, NATO, etc.

Long-term development prospects development prospects:

Further activity of UNESCO will be focused on development of the system of life-long learning for people; improvement of accessibility to the qualitative education by development of distance learning system and means of information support for this process using modern information and communication technologies. UNESCO Chair in Higher Technical Education, Applied System Analysis and Informatics along with typical areas of activity plans to expand its activities in the field of innovation activity. Besides, activity of the UNESCO Chair is directed at promotion of peace and safety through expansion of cooperation in the field of education, science and culture in the interests

of ensuring respect, justice, legality, human rights and fundamental freedoms declared in the United Nations Charter, for all people in spite of their race, language or religion.

Appendix:

1) Human Resources

1. For the Administration of the UNESCO Chair

Coordinator	Prof. Sergiy Sidorenko (part-time)
Executive Secretary	Olena Poptsova (volunteer)
Academic Secretary	Prof. Sergiy Shukayev (part-time)
Partial time support Academic Secretary	Olena Kizub (part-time)

2. For the teaching/training/research activities

The UNESCO Chair has sections:

- **HIGHER TECHNICAL EDUCATION**, headed by **academician of the National Academy of Sciences of Ukraine, Professor Yuriy Yakimenko**, *First Vice-Rector of the National Technical University of Ukraine "Kyiv Polytechnic Institute"*
- **APPLIED SYSTEM ANALYSIS**, headed by **Professor Natalia Pankratova**, *Vice-Director of the Institute for Applied System Analysis (IASA)*
- **INFORMATICS**, headed by **Professor Alexander Pavlov**, *Dean of the Faculty of Informatics and Computer Engineering NTUU "KPI"*
- **ORGANIZATIONAL BRANCH**, headed by **Professor Sergiy Shukayev**, *Deputy Head of International Collaboration Department of NTUU "KPI"*

2) Financial Resources (4 years)

Please tick sources of financial contribution and specify the amount in U.S. dollars

[tick]	Amount (\$)
<input checked="" type="checkbox"/>	Host Institution 9,000 x 4 = 36,000 \$
<input type="checkbox"/>	Partner Institution _____
<input type="checkbox"/>	Government Body _____
<input type="checkbox"/>	Other Public Institution/Body _____
	(incl. Research Councils)
<input type="checkbox"/>	UNESCO _____
<input type="checkbox"/>	Other UN Agency _____
<input type="checkbox"/>	IGO _____
<input type="checkbox"/>	NGO _____
<input type="checkbox"/>	Industry _____
<input checked="" type="checkbox"/>	Other Private 500 x 4 = 2,000 \$

Give details of financial contributions, material resources and space.

Three employees of the International Collaboration Department of NTUU "KPI" financed by the University have part-time employment at the UNESCO Chair.

1) Costs for employees: 4,000 x 4 = 16,000 \$ (for 4 years).

2) Costs for renting (equipment, infrastructure or other assets): 4,000 x 4 = 16,000 \$ (for 4 years).

3) Costs of other goods and services (consumables and supplies, translations and publications and other): 5,500 x 4 = 22,000 \$ (for 4 years).

Total: 54,000 \$.

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