



**Immanuel Kant
Baltic Federal
University**



National Centre for
Public Accreditation


SUMMARY REPORT OF THE EXTERNAL EVALUATION

of the cluster of educational programmes in

“Applied Mathematics and Information Technology”
(01.03.02, 01.04.02),

“Mathematical Support and Network Administration”
(02.03.03)

delivered by the Federal State Autonomous Educational
Institution of Higher Professional Education
“Immanuel Kant Baltic Federal University”



2016

While preparing this Summary Report we used information from the Self-Evaluation Report and the Report on the External Review of the cluster of educational programmes in “Applied Mathematics and Information Technology” (01.03.02, 01.04.02), “Mathematical Support and Network Administration” (02.03.03), delivered by the Federal State Autonomous Educational Institution of Higher Professional Education “Immanuel Kant Baltic Federal University”.

The presentation document for the use by the National Accreditation Board.

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GENERAL INFORMATION ON EDUCATIONAL INSTITUTION

Full name of the educational institution	<i>Federal State Autonomous Educational Institution of Higher Professional Education "Immanuel Kant Baltic Federal University"</i>		
Founders	<i>Ministry of Education and Science of the Russian Federation</i>		
Year of foundation	<i>1947 – Kaliningrad Pedagogical Institute 1966 – Kaliningrad State University 2005 – Russian State University named after Immanuel Kant 2010 – Immanuel Kant Baltic Federal University</i>		
Location	<i>Russia, 236041, Kaliningrad, A. Nevskogo 14</i>		
Rector	<i>Doctor of political sciences, professor Klemeshev Andrey Pavlovich</i>		
License	<i>Series AAA №002625 reg. № 2506 dated from 22.02.2012 permanent</i>		
State Accreditation	<i>Certificate of State Accreditation Series 90A01 № 0001060 reg. №0995 of 15.05.2014 valid till 15.05.2020</i>		
Number of students	<i>10891 among them:</i>		
	<i>full-time</i>		<i>8782</i>
	<i>on-site and off-site</i>		<i>141</i>
	<i>part-time</i>		<i>1968</i>

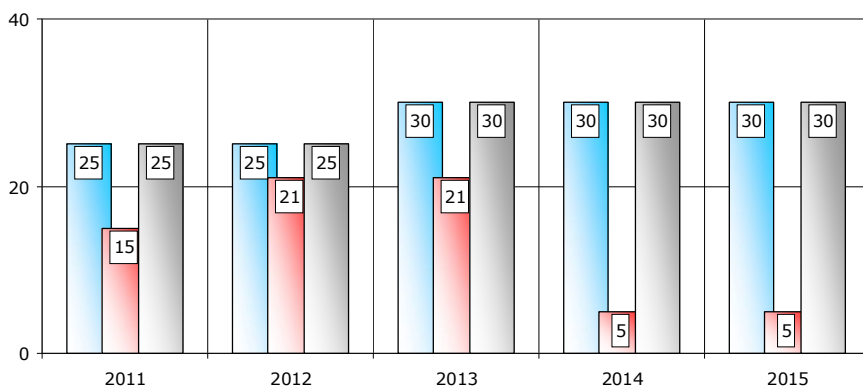
INFORMATION ON THE EDUCATIONAL PROGRAMMES UNDERGOING ACCREDITATION

Educational programmes	<i>"Applied Mathematics and Information Technology" (01.03.02, 01.04.02), "Mathematical Support and Network Administration" (02.03.03)</i>
Level of training / Standard period of training	<i>Bachelor's degree programme / 4 years Master's degree programme / 2 years</i>
Structural subdivisions (head)	<i>Institute of Applied Mathematics and Information Technologies (Doct. Sc. Phys. Math., professor Ishanov Sergey Aleksandrovich)</i>
Major departments (heads of major departments)	<i>Department of Applied Mathematics (Cand. Sc. Phys. Math., associate professor Milovanov Vladimir Fedorovich) Department of Mathematical Modeling and Data Systems (Cand. Sc. Phys. Math., associate professor Kopytov German Vasilievich)</i>
Date of the site visit	<i>October 05-07, 2015</i>
Person responsible for public accreditation of the study programme	<i>Manager of the educational programmes Novikova Ekaterina Petrovna Manager of the educational programmes Savkin Dmitry Aleksandrovich</i>

SAMPLING RESULTS OF THE PROJECT "THE BEST EDUCATIONAL PROGRAMMES OF INNOVATIVE RUSSIA"

Indicators	2015
Cluster of the educational programmes "Applied Mathematics and Information Technology" (01.03.02, 01.04.02), "Mathematical Support and Network Administration" (02.03.03)	
Number of the given programmes in the RF	344
Number of higher educational institutions to offer the given programmes	178
Number of programmes – winners of the project (% from total amount of these programmes offered in the RF)	127 (36,91%)
Kaliningrad region	
Number of the given programmes offered in the region	4
Number of programmes – winners of the project (% from total amount of these programmes offered in the region)	3 (75%)
Number of higher educational institutions and subsidiaries in the region	29
Total number of programmes offered in the region	128
Total number of programmes – winners of the project (% from total amount of these programmes offered in the region)	52 (40,6%)

REFERENCE DATA ON STUDENT ENROLLEMENT FOR PROGRAMMES



- «Прикладная математика и информатика» (01.03.02)
- «Прикладная математика и информатика» (01.04.02)
- «Математическое обеспечение и администрирование информационных систем» (02.03.03)

ACHIEVEMENTS OF THE EDUCATIONAL PROGRAMMES

Quality of the delivered educational programmes

To achieve the required quality of educational programmes the Institute of Applied Mathematics and Information Technologies hires highly qualified teaching staff in mathematic and information disciplines, cooperates closely with IT-community of the Kaliningrad region, conducts continuous monitoring of the quality of the study process and changes in professional requirements of employers.

Provision of up-to-date education

To take into account constant changes in professional requirements of business-communities the Institute of Applied Mathematics and Information Technologies arranges research and practice seminars with invitation of leading employers of the region; sociological surveys and questionnaires of students, employers and graduates; analyzes educational programmes and curricula of leading Russian and foreign HEIs, professional standards, new educational technologies.

Teaching staff (competence of the teaching staff)

Training of students and scientific management are carried out by RAS academician B.N. Chetverushkin, director of the RAS Institute of Applied Mathematics named after M.V. Keldysh, 8 professors, including V.S. Malakhovsky, Y.I. Popov, V.I. Saveliev, V.I. Semenov, L.V. Zynin, and 34 associate professors.

Scientific activity

At present the teaching staff of the Department of Applied Mathematics, Mathematical Modeling and Data Systems conducts research in the frameworks of scientific school in mathematic modeling of the processes in different spheres of knowledge ("Mathematic Modeling in Applied Tasks"). Research is carried out in the following areas: transfer of heat and mass in capillary porous colloidal environment; mathematic modeling of hydrodynamic processes of the Baltic region and many others. In 2014 in the frameworks of this direction the teaching staff of the Institute carried out grant work in the amount of 6,08 million rubles. Research results are regularly published in leading Russian and foreign journals.

Material and technical base

Classrooms supplied according to the up-to-date requirements are used in the study process.

Training of students is carried out with the use of equipment set out in laboratories of modern information technologies, high-performance computing with access to supercomputer (computing cluster) and peak performance of 5 teraflops 68 IBM BladeCenter HS21 XM. In the process of education equipment of laboratory of intellectual robotic engineering is also used: humanoid robots NAO and AP-600. The material and technical

base of the Institute is annually improved in accordance with the development programme of the University. The usage of laboratory equipment in the study process, research work, course works and graduation thesis is 100%.

Employability of graduates

The Institute has agreements with the Ministry of Industrial Policy, Enterprise Development and Trade of the Government of the Kaliningrad region, "Centre of Information and Communication Technologies" by the Administration of Kaliningrad, companies in the sphere of software development "C S Trade", "Algorithm" and others.

In the frameworks of this direction the Institute has close scientific connections with the Institute of Applied Mathematics named after M.V. Keldysh of the Russian Academy of Sciences, Kaliningrad branch of the Institute of Applied Informatics of the Russian Academy of Sciences, P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences, the Gdańsk University of Technology, Dresden University of Technology.

In 2010 - 2014 the employment parameter of graduates was 100%.

Academic mobility of students

Students of the Institute of Applied Mathematics and Information Technologies have an opportunity to study abroad in related specialties.

International projects

At present the Institute carries out an international project "Mathematic Modeling of Plasma Physics on Parallel Computing Systems of Super High Performance Capacity" carried out jointly by the teaching staff of the Institute and scientists of the Research centre in particle physics DESV (Germany).

EXTERNAL REVIEW PANEL



Daoxu Chen (China)

Review Chair, foreign expert

Director of Computer department at Nanjing University, Vice Chair of Decision Advisory Committee of HEEC accreditation, senior fellow of China Computer Federation (CCF), visiting scholar to Purdue University (1985-1986), senior visiting scholar to City University of Hong Kong (1996-1996)

A nominee of the Higher Education Evaluation Center of the Ministry of Education (HEEC)



Dmitry Goloskokov (Russian Federation)

Deputy Review Chair, Russian expert

Doctor of Technical Sciences, professor, Head of the Department of Applied Mathematics, Admiral Makarov State University of Maritime and Inland Shipping

A nominee of the Guild of experts in the sphere of professional education



Igor Mikhaylyuk (Republic of Belarus)

Panel member, foreign expert

Candidate of Physical and Mathematical Sciences, Vice Rector for socio-economic affairs, "Republic Institute of Higher School", Head of the Body for Certification of Professional Competence of Staff in the Field of Nondestructive Inspection

A nominee of the Ministry of Education of the Republic of Belarus



Sergey Kozyakov (Russian Federation)

Panel member, representative of professional community

Director "Krabwerk"

A nominee of "Krabwerk"



Dmitry Akolshin (Russian Federation)

Panel member, representative of students

5th year student, Radiotechnical Faculty of Baltic Fishing Fleet State Academy, subdivision of Kaliningrad State Technical University

A nominee of the Kaliningrad State Technical University

COMPLIANCE OF THE EXTERNAL REVIEW OUTCOMES WITH THE NCPA'S STANDARDS

STANDARD 1. Policy (mission, vision) and procedures for quality assurance

Compliance with the standard: **full compliance**

Good practice

The administration of the University and the Institute of Applied Mathematics and Information Technologies (hereinafter – institute) defined the objectives of development of the Institute and educational programmes. Administration of the University and of the Institute as well as the teaching staff took part in this process. Opinions of students and employers were also taken into account.

The development of educational programmes under accreditation is carried out within the frameworks of the mission and development strategy of the University.

The methods of achievement and correction of objectives of educational programmes as well as the quality assurance system of educational programmes providing participation of organizational structures of the University, teachers and students in the quality assurance procedures satisfy the requirements of standards and criteria of the National Centre for Public Accreditation.

Areas for improvement:

- It is necessary to form a complex quality assurance system of education, providing participation of departments, other organizational structures, teachers and students in the quality assurance procedures.
- Based on the mission and objectives it is required to develop clear development strategies of the educational programmes undergoing accreditation to define the main vector of their efficient implementation and positioning at the market of educational services of Russia.
- It is recommended to develop special indicators of quality and efficiency measurement of educational programmes in order to form data bases for a systematic monitoring of results dynamics of the Institute of Applied Mathematics and Information Technologies.

STANDARD 2. Approval, monitoring and periodic review of study programmes

Compliance with the standard: **full compliance**

Good practice

The revision of working curricula and programmes of course units is made annually in accordance with the objectives and results of educational programmes: the content of working programmes of course units and methodological materials providing implementation of the corresponding educational technology with account of development of science, technique, information technology, economics, culture and social politics, is renewed.

The procedure of revision of curricula concerns all elements of professional educational programmes and is a starting point to prepare projects of study, staff, material and technical support of the study process for the following academic year.

During formation of curricula the concurrence of the content of the disciplines is taken into account and a logical sequence of their learning is performed. The elective disciplines and courses meaningfully complete the disciplines of the federal component of the cycle.

The strong point of the educational programmes is a regular revision of curricula and working programmes in accordance with the confirmed procedure and with account of employers' and students' opinions.

Areas for improvement:

- It is necessary to update the content of the disciplines by using benchmarking instruments and in accordance with the experience of implementation of similar programmes by leading Russian and foreign HEIs.
- It is recommended to develop a documented system of indicators for monitoring and efficiency assessment of the educational programmes based on a periodic internal assessment as well as surveys of students' opinions about the disciplines of the educational programme and employers on a competence of graduates.

STANDARD 3. Assessment of student learning outcomes / competencies

Compliance with the standard: **full compliance**

Good practice

The procedure of assessment of students' knowledge / competences during intermediate and final attestation is regulated by documents developed by corresponding structures.

Quality control of training of students is carried out during the whole period of education. Assessment of students' knowledge / competences is conducted by highly-qualified teachers.

Conclusions on the quality of education are made by results of academic and scientific activities of students.

The system of moral and material incentives of scientific activity of students and Master degree students is used effectively and guarantees successful participation of students in all-Russian and international Olympiads and exhibitions (for example World championship in programming, all-Russian stage of the Universal Olympiad in robotic engineering, all-Russian exhibition of scientific art of youth and others).

About 90% of all graduation papers have external customer. Employment of graduates is from 70 to 100 %.

In the course of meetings students and graduates of the Institute showed a good knowledge of English including technical terms, which shows a high level of training and should promote international mobility of students.

Areas for improvement:

- It is necessary to increase the number of distant types of education and to introduce corresponding software.
- It is recommended to develop and fully implement a system of computer testing by the results of which to conduct interviews in order to get an objective assessment of knowledge.
- It is advisable to attract more actively students in the work of departments in the frameworks of scientific grants.
- It is recommended to increase the number of joint publications of teachers and students in Russian and foreign journals.
- It is necessary to address the issue of target preparation of specialists by request of employers.
- It is recommended to use the procedures of independent assessment of learning outcomes on a regular basis.

STANDARD 4. Quality assurance of teaching staff

Compliance with the standard: **full compliance**

Good practice

The teaching staff of the Institute is competent in the areas covered by the educational programme.

Professional level of the teaching staff fully corresponds with the requirements.

There is a close connection between the study process and research work. The teaching staff takes active part in the work of different international, all-Russian and intramural conferences, seminars, exhibitions; regularly publishes research results in rating journals. In addition the University publishes its own journals included in HAC list. Teachers carry out works on internal grants aimed at improvement of the educational activity.

The Institute created conditions and provided financing to attract teachers and scientists from leading Russian and foreign scientific and educational organizations to give lectures.

The University developed performance indicators of the teaching staff to make ratings. Based on these data the Institute conducts diagnostics of quality of teaching and motivation of the teaching staff because on the basis of these ratings it carries out incentive compensation.

Policy and strategy in increasing qualification of the teaching staff are carried out in the frameworks of the general staff policy of the University and regulation on professional development.

Areas for improvement:

- It is recommended to conduct professional development of the teaching staff in Russian and foreign HEIs in psychological and pedagogical disciplines as well.
- It is necessary to increase the number of publications of the teaching staff in foreign editions.

INFORMATION ON THE LEADING TEACHERS OF THE EDUCATIONAL PROGRAMMES

Ishanov Sergey

Doctor of Physical and Mathematical Sciences, professor of the Department of Mathematical Modeling and Data Systems, Director of the Institute of Applied Mathematics and Information Technologies, Honoured Worker of Higher Professional School of RF, Diploma of the Ministry of Education and Science of RF

Boris Chetverushkin

Doctor of Physical and Mathematical Sciences, professor of the Department of Mathematical Modeling and Data Systems, Director of the Institute of Applied Mathematics named after M.V. Keldysh, academician of the Russian Academy of Sciences

Valery Saveliev

Doctor of Physical and Mathematical Sciences, professor of the Department of Applied Mathematics, scientist of the Institute of Applied Mathematics named after M.V. Keldysh of the Russian Academy of Sciences

Leonid Pestov

Doctor of Physical and Mathematical Sciences, professor of the Department of Applied Mathematics, head of laboratory of three-dimensional seismic measurements and inverse problem of wave processes

Leonid Zinin

Doctor of Physical and Mathematical Sciences, professor of the Department of Mathematic Modeling and Data Systems, Honoured Worker of Higher Professional School of RF

Nikolai Kaschenko

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Mathematic Modeling and Data Systems, Honoured Worker of Higher Professional School of RF

German Kopytov

Candidate of Physical and Mathematical Sciences, head of Department of Mathematic Modeling and Data Systems

Vladimir Milovanov

Candidate of Physical and Mathematical Sciences, head of Department of Applied Mathematics; Honoured Worker of Higher Professional School of RF

Vladimir Semenov

Doctor of Physical and Mathematical Sciences, professor of the Department of Fundamental Mathematics, medal "For contribution into the development of Kuzbas"

Yury Popov

Candidate of Physical and Mathematical Sciences, professor, professor of the Department of Fundamental Mathematics, Veteran of the system of education of Kaliningrad region, For merit to the Immanuel Kant Baltic Federal University

Dmitry Chemakin

Candidate of Economic Sciences, assistant professor of the Department of Mathematic Modeling and Data Systems, minister of industrial policy, development of business and trade of the Kaliningrad region

Evgeny Novikov

Managing director of "KD VIZHEN", team manager of IKBFU Iris Check, 3 place in nomination "Social projects" in Imagine Cup 2015 final

Aleksey Polyakov

Candidate of Technical Sciences, assistant professor of the Department of Mathematic Modeling and Data Systems, general director of "Triakses Vision"

Oleg Guschin

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Applied Mathematics, Honoured Worker of Higher Professional School of RF

Sergey Grigoriev

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Applied Mathematics

Aleksey Buzdin

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Applied Mathematics, diploma of the Ministry of Education and Science of RF

Gennady Kvitko

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Applied Mathematics; diploma of the Ministry of Education and Science of RF, diploma of the Ministry of Education of Kaliningrad region

Mikhail Kreto

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Mathematic Modeling and Data Systems, director "BLTA"

Vladimir Khudenko

Candidate of Physical and Mathematical Sciences, associate professor, assistant professor of the Department of Fundamental Mathematics; Honoured Worker of Higher School of RF, diploma of the Ministry of Education and Science of RF, medal "For Merit to the IFBFU"

STANDARD 5. Learning resources and student support

Compliance with the standard: **full compliance**

Good practice

Educational programmes are supplied with a corresponding number of classrooms, laboratories and equipment. Multimedia classrooms, internet-resources are used for optimization of the process of education. The material and technical base, computer and other technical equipment allow opening new highly-technological educational programmes. There is a supercomputer with a peak performance of 5 teraflops, which is actively used in the study process and research. The Institute regularly allocates funds for acquisition of new equipment and software.

Freely distributed e-versions of study guides as well as methodological materials developed by IKBFU are used in many disciplines.

Every discipline is supplied with necessary electronic educational resources; a great majority of them is placed at educational servers of the University

For an independent work of students there are reading rooms of the University library and computer classes in the Institute. Students, postgraduate students and teachers have an access to modern scientific data bases: Elibrary, SpringerLink, Oxford Reference Online, LexisNexis, ProQuest, EBSCO, Taylor & Francis Group, Sage Publications, World Scientific.

All University buildings and hostels are braced with a common optical fiber network and wireless access networks to educational resources and Internet, which provide necessary conditions for an independent academic and research work of students.

The Institute created conditions for a barrier-free environment for handicapped people.

Areas for improvement:

- Supercomputer may be used as an additional source of financial resources of the University. It is recommended to widely inform public about the possibilities of a supercomputer and thus to form a bank of orders from representatives of a real sector of economy.

STANDARD 6. Information system providing effective implementation of the study programme

Compliance with the standard: **substantial compliance**

Good practice

Information support is conducted through a system of electronic document flow, staff department and graduates' employment promotion office.

A large majority of educational disciplines is supplied with electronic methodological materials including study programmes, guidelines on studying the disciplines, study guides, tests and laboratory courses.

Methodological materials, e-books and study guides are available at the local network of the University and at the departments of the Institute.

The administration of the University regularly collects information from departments concerning participation of students in different conferences, Olympiads and competitions. The level of performance is assessed on the basis of data bases with information about every student.

Information about the results of conferences, Olympiads, competitions with participation of students is presented at the official website of the University.

Areas for improvement:

- It is recommended to use more actively the practice of testing for a current control and independent preparation of students.
- It is necessary to implement a point-rating assessment system of students' performance and quality of training in all disciplines and specialties delivered in the Institute.

STANDARD 7. Public information

Compliance with the standard: **substantial compliance**

Good practice

Public information is carried out through the official website of the University, Institute and departments, guides for applicants, as well as at traditional annual open days of faculties and institutes. Articles about the Institute are regularly published in local Mass Media. Information brochure about the Institute is regularly published.

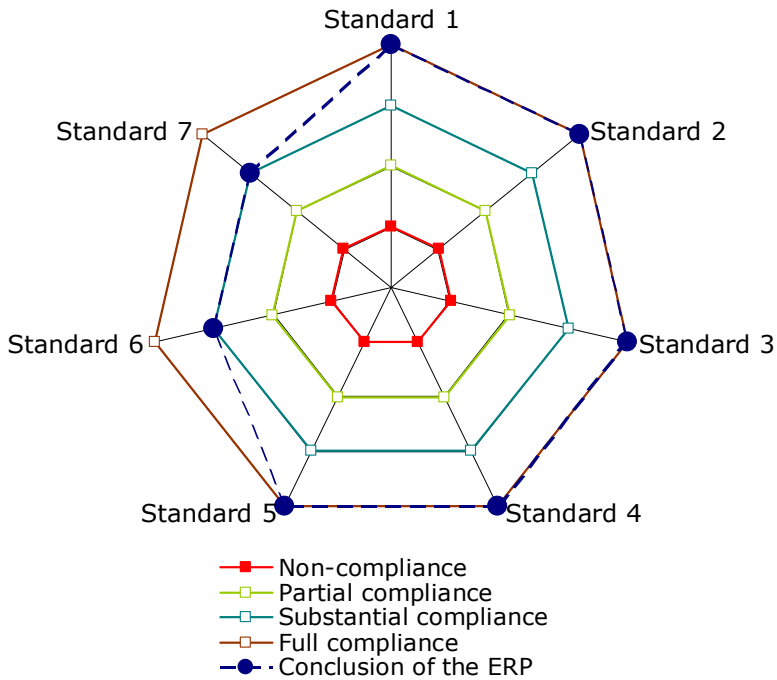
The teaching staff of the Institute conducts vocational-oriented meetings, University Olympiads in mathematics and informatics, consultations on the Unified State Examinations. Vocational-oriented work at the departments and the Institute is carried out annually.

Monitoring research of graduates' employment and in-demand at the labour market are conducted on a constant base. Data analysis on graduates' employment is carried out at the Institute and departments which is reflected in corresponding reports of departments, representatives of State Examination Commission. Employment of graduates is from 70 to 100 %.

Areas for improvement

- It is necessary to increase the volume of data about the educational programme published in English.
- It is recommended to publish information about the employment of graduates in a free access at the official website of the University.
- It is advisable to enforce the connection of the Institute with graduates of these educational programmes.

DISTRIBUTION DIGRAM OF THE EXTERNAL REVIEW OUTCOME



Standard 1. Policy (mission, vision) and procedures for quality assurance

Standard 2. Approval, monitoring and periodic review of programs and qualifications

Standard 3. Assessment of student learning outcomes / competencies

Standard 4. Quality assurance and competencies of teaching staff

Standard 5. Learning resources and student support

Standard 6. Information system providing effective implementation of the study program

Standard 7. Public information

CONCLUSION OF THE EXTERNAL REVIEW PANEL

Based on the self-evaluation report analysis, documents and data submitted and interviews the External Review Panel came to the conclusion that educational programmes "Applied mathematics and information technology" (01.03.02, 01.04.02), "Mathematical support and network administration" (02.03.03), delivered by the Federal State Autonomous Educational Institution of Higher Professional Education "Immanuel Kant Baltic Federal University" substantially comply with the standards and criteria of public accreditation of the National Centre for Public Accreditation.

The External Review Panel recommends the National Accreditation Board to accredit the educational programmes "Applied mathematics and information technology" (01.03.02, 01.04.02), "Mathematical support and network administration" (02.03.03) for the period of 6 years.

SCHEDULE OF THE SITE VISIT OF THE EXTERNAL REVIEW PANEL

Time	Activity	Participants	Venue
October 5			
08.45	Arrival at BFU		Administrative building, BFU
09.00 – 11.00	Training for the ERP members		Administrative building, BFU
11.00 – 13.00	Meeting of the ERP with the university administration and staff members responsible for accreditation	Rector, Vice-Rectors, ERP	Administrative building, BFU
13.00 – 14.00	Lunch		
14.00 – 14.30	Transfer to Building № 2		
14.30 – 15.30	Excursion around the university		Building 2
15.30 – 16.30	Meeting with directors of Institutes and heads of departments	Director of the Institute, deputy directors, heads of departments, Manager, ERP	Building 2, room 209
16.30 – 17.00	Work with documents	ERP	Building 2, room 208
17.00 – 18.00	Meeting with representatives of employers	Representatives of employers, ERP	Building 2, room 209
18.00 – 18.30	Internal meeting of the ERP	ERP	Building 2, room 208

Time	Activity	Participants	Venue
October 6			
9.45	Arrival at BFU		Building 2
10.00 – 11.00	Meeting with students	Students, ERP	Building 2, room 209
11.00 – 11.30	Internal meeting of the ERP	ERP	Building 2, room 208
11.30 – 12.30	Meeting with teaching staff	Teaching staff, ERP	Building 2, room 209
12.30 – 13.30	Lunch		
13.30 – 15.30	Internal meeting of the ERP.	ERP	Building 2, room 208
15.30 – 16.30	Attending classes	ERP	Building 2
16.30 – 17.30	Meeting with alumni	Alumni, ERP	Building 2, room 209
17.30 – 18.00	Internal meeting of the ERP	ERP	Building 2, room 208
October 7			
08.45	Arrival at BFU		Building 2
09.00 – 11.30	Internal meeting of the ERP: discussion of preliminary results of the site visit, preparation of the oral report of the panel	ERP	Building 2, room 208
11.30 – 12.00	Transfer to main building		
12.00 – 13.00	Lunch		
13.00 – 15.00	Closing meeting of the External Review Panel with BFU representatives	Administration of the University, ERP	Main building