**Roadmap of STRA-U ‘Mathematics, Computer Science and Information Technology’**

**I. Goal:** to build an continuous research cycle and educational trajectory “from fundamental mathematics via computer science to applications in information technologies and contemporary engineering” that will produce scholars, practitioners and researchers highly competitive at the national and international markets.

**II. Objectives:**

- Successful breakthrough research in the top globally evolving fields of study: algebraic geometry and mathematical physics, data analysis and machine learning, mathematical and computer modelling;

- Supporting research in the following interdisciplinary fields: number theory, representation theory and dynamical systems, mathematical logic and theoretical computer science, mathematical methods of optimization and stochastics, and system and software engineering;

- Developing mathematical tools and computer technologies for use in social science, economics and humanities;

- Developing English language Master’s programs in mathematics and software engineering, implementation of educational programs in partnership with leading Russian and international research centers in fundamental mathematics and data science;

- Adjusting curricula and teaching methodologies to better reflect employers’ needs and the requirements of the IT labor market.

**III. Expected Deliverables:**

- New research areas emerge: biological and medical informatics, neuromathematics, machine-based teaching in social studies and humanities, operating systems and compilation technologies;

- World-class results in the study of the geometry of algebraic varieties in collaboration with Steklov Mathematical Institute; data analysis with applications of the processing of experimental evidence produced by the Large Hadron Collider; and information retrieval, computer vision and recommendation systems in partnership with Yandex;

- Practice-oriented model for educational programs based on the integrated interaction system “faculties – research laboratories – academic institutes – high-tech companies”, implemented in coordination with Yandex, the Institute for Information Transfer Problems (Kharkevich Institute) and the Institute for System Programming. This model, on one hand, will ensure that recent academic achievements and technical solutions are used in educational process. On the other hand, the model facilitates the transfer of technologies developed by STRA-U project groups and laboratories to the open market, with support from partner companies (Yandex, JetBrains, CROC, etc.);

- Bachelor’s and Master’s programs with an enhanced interdisciplinary component, such as Applied Mathematics and Informatics with exclusive concentration in deep learning, neural networks, image and video analysis;

- Elective tracks at the undergraduate-master’s level and master’s-doctoral level, designed for students from different fields of study; for students of HSE doctoral schools in mathematics, computer science and technical sciences, a thesis topic should be related to STRA-U’s current research or applied projects;

- The University’s international academic reputation has been proven by joining the Top-150 in the QS Subject Ranking for “Mathematics”, the Top-300 in the QS Subject Ranking for “Computer Science & Information Systems” and the Top-200 in the ARWU Ranking for “Mathematics”.

**IV. STRA-U Target Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Indicators** | **Units of Measurement** | **Key Results** |
| **Plan 2015**  | **Actual 2016**  | **Plan 2017**  | **Plan 2018**  | **Plan 2019**  | **Plan 2020**  |
| 1. | Position in the QS Ranking by subject: Mathematics | position | - | 251-300 | 151-200 | 151-200 | 101-150 | 101-150 |
| 2. | Position in the QS Ranking by subject: Computer Science & Information Systems | position | - | 401-500 | 451-500 | 401-450 | 301-350 | 251-300 |
| 3. | Position in the ARWU Ranking by subject: Mathematics | position | - | - | - | - | - | 151-200 |

**IV. Action Plan\***

| **No.** | **Efforts** | **Timeframe for implementation***(check “X” in relevant graphs)* | **Results***(description, indicators for 2016-2020)*  | **Responsible persons***(for 2016)* |
| --- | --- | --- | --- | --- |
| **2016** | **2017** | **2018** | **2019** | **2020** |
| **Apr-Sept** | **Oct-Dec** |
| **1. Organizational Efforts** |
| 1.1. | STRA-U’s organizational structure is developed |  |  |  |  |  |  |  | Arzhantsev, I.V. |
| 1.1.1. | Approval of the STRA-U’s management committee, determination of its functions and operational approach | X |  |  |  |  |  | Rector’s directive on the STRA-U’s management committees; approved regulation on the STRA-U | Arzhantsev, I.V. |
| 1.1.2. | Approval of the STRA-U’s international advisory council, along with its functions and system of operations | X |  |  |  |  |  | Rector’s directive on the STRA-U’s international advisory council; approved regulation on the STRA-U | Arzhantsev, I.V. |
| 1.2. | Confirmation of the STRA-U’s internal structure (subdivisions) | X |  |  |  |  |  | Rector’s directive on the list of subdivisions to be included under the STRA-U | Arzhantsev, I.V.Silantiev, S.A. |
| 1.3. | Confirmation of a system of interactions among the STRA-U’s subdivisions, as well as a decision-making model for the unit’s operations | X |  |  |  |  |  | Approved regulation on the STRA-U | Arzhantsev, I.V. |
| 1.4. | Formation of the STRA-U’s project teams and confirmation of necessary material and information sources for their operations |  | X |  |  |  |  | Protocol of the STRA-U’s management committee providing a list of key projects (educational, research projects, etc.), as well as the composition of relevant project teams | Arzhantsev, I.V.Silantiev, S.A. |
| 1.5. | Review conducted by the STRA-U’s management committee and international advisory council of its three-year action plans for academic and research development |  | X |  |  | Х |  | Protocols of the STRA-U’s management committee and international advisory council, thereby approving development plans for the unit’s academic and research activities | Arzhantsev, I.V.Silantiev, S.A. |
| 1.6. | Development of revenue targets for each STRA-U, thereby ensuring its development in line with approved plans |  | X |  |  |  |  | Forecast estimate of the STRA-U’s revenue (to be updated every year)Protocol of the STRA-U’s management committee on the unit’s projected revenues (subject to approval by HSE’s Planning and Finance Office) | Arzhantsev, I.V. |
| 1.7. | Activities to promote the STRA-U | X | X | X | X | X | X | 2016 – creation of the STRA-U’s own webpage on the HSE corporate portal; - determining who is responsible for information about the unit published on the portal;- updating of the STRA-U’s website; - maintaining a news feed on the unit’s activities. | Arzhantsev, I.V. |
|  | **2. Development Plan for the STRA-U’s Educational Activities** |
| 2.1. | Developing current and starting up new educational programmes |  |  |  |  |  |  |  |  |
| 2.1.1. | Starting up new educational programmes |  |  |  |  |  |  |  |  |
| 2.1.1.1. | *Programme:* Materials. Devices. Nanotechnologies*Programme level:* Master’s*Programme description:* full-time |  |  | X |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Research organizations:* * P.L. Kapitza Institute for Physical Problems (RAS) (agreement shall be signed in 2017);
* Lebedev Physical Institute (LPI RAS) (agreement shall be signed in 2017);
* Prokhorov General Physics Institute (RAS) (agreement shall be signed in 2017);
* A.A. Baikov Institute of Metallurgy and Materials Science (RAS) (agreement shall be signed in 2017);
* National Research Center ‘Kurchatov Institute’ (agreement shall be signed in 2017).

*Companies:* CJSC Superconducting Nanotechnology ‘SCONTEL’ (agreement has been signed)*Research projects associated with the programme:** Grant project: ‘Temperature and Field Dependence of the Non-stationary Mobility of Charge Carriers in Molecularly Doped Polymers’ (2016);
* Grant project: ‘Development of Kinetic-Inductance Single-Photon Detectors for Visible, Near and Far Infrared Ranges’ (2016);
* Grant project: ‘Behaviour of Structural and Functional Materials Under Extreme Conditions’ (2016-2017);
* Grant project: ‘Poole-Frenkel Effect and Anomalies of the Hopping Transport in Organic Glasses and Molecularly Doped Polymers’ (2015-2017);
* Grant project: ‘Modelling the Impact of Thermal and Radiation Effects on Microelectronic Components’ (2015-2016).

*Annual intake of students (overall/international students):*2017 – 15/15, 2018 – 15/15, 2019 – 17/15, 2020 – 17/15.*Short description*The programme is aimed at training professional researchers in quantum-effect nanoelectronics and covers the theory and practical applications of applied physics and related sciences (e.g., non-conventional materials, instrumentation, analytical and numerical methods for mathematical modeling of new physical phenomena and processes, etc.), as well as cutting-edge innovations in nanophysics and nanotechnologies. | Kagan, M.Y.Pozhidaev, Y.D. |
| 2.1.1.2. | *Programme:* Quantum Information Technologies*Programme level:* Master’s*Programme description:* full-time, delivered in English |  |  | X |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Research organizations:* * Lebedev Physical Institute (LPI RAS) (agreement shall be signed in 2017);
* P.L. Kapitza Institute for Physical Problems (RAS) (agreement shall be signed in 2017).

*Companies:* CJSC Superconducting Nanotechnology ‘SCONTEL’ (agreement has been signed)*Research projects associated with the programme:** Grant project: ‘Quantum Cooperative Phenomena at Low Temperatures (2016)’;
* Grant project: ‘Nanoelectronics of Quantum Systems (2017-2019)’;
* Grant project: ‘Quantum-Size Effects in Metallic Nanostructures (2015-2016)’;
* Grant project: ‘Properties of Hybrid Nanostructures: Topological Insulator / Superconductor (2016-2017)’.

*Annual intake of students (overall/international students):*2017 – 15/15, 2018 – 15/15, 2019 – 17/15, 2020 – 17/15.*Short description*The main goal of the programme is to train highly-qualified researchers, who will be capable of solving complex problems related to the transmission, storage and processing of data using quantum-information technologies and other cutting edge developments in nanophysics. | Arutyunov, K.Y. |
| 2.1.1.3. | *Programme:* ‘Supercomputer Modeling in Science and Engineering’*Programme level:* Master’s*Programme description:* full-time, delivered in English |  |  |  |  |  | X | *Start of programme:* 2020*Partners (status of agreement)**Universities:* * Coventry University (UK) (agreement under review);
* Mississippi State University (agreement under review);
* L'Istituto per le Applicazioni del Calcolo ‘Mauro Picone’ (Italy) (agreement under review)

*Research organizations:* * Dorodnicyn Computing Centre (RAS) (agreement has been signed);
* RAS Research Centre in Chernogolovka (agreement has been signed);
* Landau Institute for Theoretical Physics (RAS) (agreement under review);
* V.A. Trapeznikov Institute of Control Sciences (RAS) (agreement has been signed).

*Research projects associated with the programme:** Grant project: ‘Supercomputer Modeling of Complex Systems’.

*Annual intake of students (overall/international students):*2020 – 20/10.*Short description*The programme is aimed at training researchers specializing in supercomputer calculation, as well as dynamic objects and process control systems. | Shchur, L.N.Belov, A.V. |
| 2.1.1.4. | *Programme:* joint undergraduate programme of HSE and the Centre for Teaching Excellence *Programme level:* undergraduate*Programme description:* network-based |  |  | Х |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Companies:* Centre for Teaching Excellence*Annual intake of students (overall/international students):*2017 – 20/0, 2018 – 20/0, 2019 – 25/0, 2020 – 25/0.*Short description*The programme trains teachers who intend to work in top secondary schools with a mathematical focus. | Timorin, V.A.Esterov, A.I. |
| 2.1.1.5. | *Programme:* joint Master’s programme of HSE and the Centre for Teaching Excellence *Programme level:* Master’s*Programme description:* network-based |  |  | Х |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Companies:* Centre for Teaching Excellence*Annual intake of students (overall/international students):*2017 – 20/0, 2018 – 20/0, 2019 – 20/0, 2020 – 20/0.*Short description*The programme trains teachers who are planning to work in top secondary schools with a mathematical focus. | Timorin, V.A.Esterov, A.I. |
| 2.1.1.6. | *Programme:* ‘System Programming’*Programme level:* Master’s*Programme description:* full-time |  |  | X |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Research organizations:* Institute for System Programming (RAS)*Companies:* IBM, Lanit, IBS, Prognoz, Kaspersky Laboratory (practical cooperation)*Annual intake of students (overall/international students):*2017 – 20/3, 2018 – 20/3, 2019 – 22/4 , 2020 – 22/4.*Short description*The programme is aimed at training professionals in operating systems development, compiler technologies, text processing and software verification. | Petrenko, A.K.Grinkrug, E.M. |
| 2.1.1.7. | *Programme:* ‘Statistical Learning Theory’*Programme level:* Master’s*Programme description:* full-time, delivered in English |  |  | Х |  |  |  | *Start of programme:* 2017*Partners (status of agreement)**Universities:* Skoltech*Research organizations:* Institute for Information Transmission Problems (Kharkevich Institute)*Companies:* Datadvance, Telum (practical cooperation)*Annual intake of students (overall/international students):*2017 – 20/3, 2018 – 20/3, 2019 – 22/4, 2020 – 22/4.*Short description*The programme trains researchers and analysts in statistical learning theory, who shall be capable of finding solutions for reliability issues with respect to recovering empirical data correlations. | Spokoiny, V.G. |
| 2.1.1.8. | *Programme:* ‘Data Protection Technologies’*Programme level:* undergraduate *Programme description:* full-time |  |  |  | X |  |  | *Start of programme:* 2018*Partners (status of agreement)**Research organizations:* All-Russian Research Institute for Optical and Physical Measurements (agreement has been signed), Research Institute of Communication and Control Systems (agreement has been signed), Engineering and Marketing Center of the Vega Corporation (agreement has been signed).*Companies:* S.P. Korolev Rocket and Space Corporation Energia, CJSC Superconducting Nanotechnology ‘SCONTEL’ (agreement has been signed)*Annual intake of students (overall/international students):*2018 – 25/3, 2019 – 25/3, 2020 – 25/3.*Short description*The programme is aimed at training specialists, capable of solving information security problems in context of existing information hazards. | Potomskiy, S.Y. |
| 2.1.1.9. | *Programme:* ‘Internet of Things Engineering’ *Programme level:* Master’s*Programme description:* full-time |  |  |  | X |  |  | *Start of programme:* 2018*Partners (status of agreement)**Research organizations:* Research Institute of Communication and Control Systems (agreement has been signed), Research Institute of Automated Equipment named after V.S. Semenikhin (agreement shall be signed in 2017), Moscow Construction Bureau ‘Kompas’ (agreement has been signed), Central Research Radiotechnical Institute named after Academician A.I. Berg (agreement shall be signed in 2017), Engineering and Marketing Center of the Vega Corporation (agreement has been signed)*Companies*: National Instruments Corporation (agreement has been signed)*Annual intake of students (overall/international students):*2018 – 20/2, 2019 – 20/2, 2020 – 20/3.*Short description*The programme trains professionals in multi-functional integrated control and communication systems, who shall be capable of developing competitive domestic hardware and software for telecommunications equipment intended for use under extreme conditions. | Ivanov, I.A. |
| 2.1.1.10. | *Programme:* ‘Data Analysis for Biology and Medicine’*Programme level:* Master’s*Programme description:* full-time, several courses offered in English | X |  |  |  |  |  | *Start of programme:* 2016*Partners (status of agreement)**Universities:* Leiden University (Netherlands) (practical cooperation)*Research organizations* A.N. Belozersky Institute Of Physico-Chemical Biology, Vavilov Institute of General Genetics (VIGG), M.M. Shemyakin–Y.A. Ovchinnikov Institute of Bioorganic Chemistry (RAS), Institute for Information Transmission Problems (Kharkevich Institute), Research Institute of Physical and Chemical Medicine under the Federal Agency for Medicine and Biology, Skolkovo Institute of Science and Technology, Moscow School of Bioinformatics (practical cooperation)*Annual intake of students (overall/international students):*2016 – 23/2, 2017 – 25/2, 2018 – 25/2, 2019 – 25/3, 2020 – 25/3. *Short description*The programme is aimed at training future leaders in bioinformatics, who shall be able to develop new computational methods and apply them to solving issues related to biology and medicine. The main advantage of this programme is that it provides interdisciplinary education, as well as an understanding of both biological systems and mathematical methods. Furthermore, the programme shall become a competitive standard for a Master’s degree in ‘Bioinformatics’, which shall, in turn, foster the integration of information science and related disciplines at HSE.  | Gelfand, M.S. |
| 2.1.2. | Reformatting/developing current educational programmes |  |  |  |  |  |  |  |  |
| 2.1.2.1 | *Programme:* ‘Software Engineering’*Programme level:* undergraduate *Programme description:* full-time, several courses offered in English |  |  | Х |  |  |  | *Start of programme:* 2006*Reformatting period:* 2017*Focus of the reformat:* international accreditation with АВЕТ  | Shilov, V.V.Silantiev, S.A. |
| 2.1.2.2. | *Programme:* ‘System and Software Engineering’*Programme level:* Master’s*Programme description:* full-time, delivered in English, double-degree |  | Х |  |  |  |  | *Start of programme:* 2015*Reformatting period:* 2016*Focus of the reformat:* signing an agreement on double degrees with Lappeenranta University of Technology(Finland) | Silantiev, S.A. |
| 2.1.2.3. | *Programme:* ‘Data Science’*Programme level:* Master’s*Programme description:* full-time, double-degree, several courses offered in English |  | Х |  |  |  |  | *Start of programme:* 2014*Reformatting period:* 2016*Focus of the reformat:* signing an agreement on double degrees with [Université Blaise Pascal](https://www.google.ru/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjY-tCHhLLQAhVHjiwKHcfOCJcQFggbMAA&url=http%3A%2F%2Fwww.univ-bpclermont.fr%2F&usg=AFQjCNFocJxC28lBq_m3NIdTR5K1SspREA&sig2=Z_Yyv5-GApK1TE184mQQwg&bvm=bv.139250283,d.bGg) (France) | Silantiev, S.A. |
| 2.1.2.4. | *Programme:* ‘Computer Systems and Networks’*Programme level:* Master’s*Programme description:* full-time |  | Х |  |  |  |  | *Start of programme:* 2013*Reformatting period:* 2016*Focus of the reformat:* integrating continuing education courses in ZyXEL and QNAP equipment and technologies into the curriculums with a ‘Computer Networks’ concentration, as well as integrating IBM software into the curriculums with an ‘Information and Analytical’ systems concentration  | Vishnekov, A.V.Kopranov, D.A.Uryupin, V.M.Shmid, A.V.Pozin, B.A. |
| 2.1.2.5. | *Programme:* ‘Computer Security’*Programme level:* Specialist*Programme description:* full-time |  |  |  |  | Х |  | *Start of programme:* 2012*Reformatting period:* 2019*Focus of the reformat:* introducing practical classes at the laboratory based out of the Department of Information Protection under National Research University of Electronic Technology  | Belov, A.V. |
| 2.1.2.6. | *Programme:* ‘Information and Communication Technologies and Communication Systems’*Programme level:* undergraduate *Programme description:* full-time | Х |  |  |  |  |  | *Start of programme:* 2012*Reformatting period:* 2016*Focus of the reformat:* introducing new courses for respective concentration, as well as a project-based seminar, research seminar and hands-on workshop  | Nazarov, I.V. |
| 2.1.2.7. | *Programme:* ‘Electronic Engineering’*Programme level:* Master’s*Programme description:* full-time | Х |  |  |  |  |  | *Start of programme:* 2013*Reformatting period:* 2016*Focus of the reformat:* introducing new courses for respective concentration, as well as a project-based seminar, research seminar and hands-on workshop | Yurin, A.I. |
| 2.1.2.8. | *Programme:* ‘Applied Physics’*Programme level:* Master’s*Programme description:* full-time |  |  | Х |  |  |  | *Start of programme:* 2014*Reformatting period:* 2017*Focus of the reformat:* introducing new courses for respective concentration, as well as a research seminar and hands-on workshop | Popova, E.A. |
| 2.1.2.9. | *Programme:* ‘Informatics and Computing Equipment’*Programme level:* undergraduate *Programme description:* full-time | Х |  |  |  |  |  | *Start of programme:* 2014*Reformatting period:* 2016*Focus of the reformat:* adding mandatory courses to the curriculum: project-based seminar, research seminar and hands-on workshop | Starykh, V.A. |
| 2.1.2.10. | *Programme:* ‘Applied Mathematics’ *Programme level:* undergraduate *Programme description:* full-time | Х |  |  |  |  |  | *Start of programme:* 2012*Reformatting period:* 2016*Focus of the reformat:* adding mandatory courses to the curriculum: project-based seminar, research seminar and hands-on workshop | Belov, A.V. |
| 2.1.2.11 | *Programme:* ‘Mathematical Methods in Natural Sciences and Computer Technologies’*Programme level:* Master’s*Programme description:* full-time | Х | Х |  |  |  |  | *Start of programme:* 2013*Reformatting period:* 2016*Focus of the reformat:* the programme was renamed ‘Mathematical Methods of Modelling and Computer Technologies’  | Belov, A.V. |
| 2.1.2.12. | *Programme:* ‘Management Systems and Information Processing in Engineering’*Programme level:* Master’s*Programme description:* full-time | Х  | Х |  |  |  |  | *Start of programme:* 2013*Reformatting period:* 2016*Focus of the reformat:* the programme is being reformatted in order to train professionals, capable of developing management systems for dynamic structures and supercomputer calculations. | Belov, A.V.  |
| 2.1.3. | Integrating courses provided in English and online courses into educational programmes |  |  |  |  |  |  |  |  |
| 2.1.3.1. | Developing online courses delivered in English for Coursera  | Х | Х | Х | Х | Х | Х | *Number of new courses in English available through the Coursera platform:*2016 – 3, 2017 – 2, 2018 – 2, 2019 – 2, 2020 – 3.*Number of learners who shall successfully complete courses delivered in English through the Coursera platform (‘Active Learners’ status):*2016 – 5000, 2017 – 6000, 2018 – 7000, 2019 – 10000, 2020 – 12000. | Podolskaya, O.V.Timorin, V.A. |
| 2.1.3.2. | Adding new English-taught courses to the ‘Math in Moscow’ programme |  |  | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2017 – 1/0, 2018 – 1/0, 2019 – 2/0, 2020 – 2/0.*Number of students who add MiM English-taught courses to their individual curriculum:* 2017 – 5, 2018 – 5, 2019 – 5, 2020 – 6.*Number of international students who shall complete courses under mobility programmes:* 2017 – 28, 2018 – 32, 2019 – 32, 2020 – 34. | Timorin, V.A.Esterov, A.I. |
| 2.1.3.3. | Adding courses taught in English to the curriculum of the ‘Data Science’ Master’s programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 10/0, 2017 – 1/0, 2018 – 1/0, 2019 – 2/0, 2020 – 2/0*Number of students who add English-taught courses to their individual curriculum:* 2016 – 90, 2017 – 90, 2018 – 95, 2019 – 95, 2020 – 100.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 1/0, 2017 – 1/0, 2018 – 1/0, 2019 – 1/0, 2020 – 2/0. | Kuznetsov, S.O. |
| 2.1.3.4. | Adding courses taught in English to the curriculum of the ‘Data Analysis for Biology and Medicine’ Master’s programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 3/0, 2017 – 2/0, 2018 – 1/0, 2019 – 1/0, 2020 – 1/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 23, 2017 – 45, 2018 – 45, 2019 – 50, 2020 – 50.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0/0, 2017– 0/0, 2018 – 0/0, 2019 – 0/0, 2020 – 1/0. | Gelfand, M.S. |
| 2.1.3.5. | Adding courses taught in English to the curriculum of the ‘Mathematical Methods of Optimization and Stochastics’ Master’s programme | Х | Х | Х |  |  |  | *Number of new courses delivered in English (total/online):*2016 – 1/0, 2017 – 1/0.*Number of students who add English-taught courses to their individual curriculum* 2016 – 19, 2017 – 20.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0/0, 2017 – 0/0. | Spokoiny, V.G. |
| 2.1.3.6. | Adding courses taught in English to the curriculum of the ‘Software Engineering’ undergraduate programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 6/0, 2017 – 1/0, 2018 – 0/0, 2019 – 0/0, 2020 – 0/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 275, 2017 – 330, 2018 – 400, 2019 – 410, 2020 – 420.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0/0, 2017 – 0/0, 2018 – 0/0, 2019 – 0/0, 2020 – 1/0. | Shilov, V.V. |
| 2.1.3.7. | Adding courses taught in English to the curriculum of the ‘Applied Mathematics and Informatics’ undergraduate programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online)*2016 – 8/0, 2017 – 0/0, 2018 – 0/0, 2019 – 1/0, 2020 – 1/0.*Number of students who add English-taught courses to their individual curriculum.* 2016 – 180, 2017 – 180, 2018 – 185, 2019 – 190, 2020 – 190.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0 /0, 2017 – 0/0, 2018 – 0/0, 2019 – 0/0, 2020 – 1/0. | Konushin, A.S. |
| 2.1.3.8. | Adding courses taught in English to the curriculum of the ‘Information and Communication Technologies and Communication Systems’ undergraduate programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 4/0, 2017 – 5/0, 2018 – 6/0, 2019 – 0/0, 2020 – 0/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 0, 2017 – 2, 2018 – 5, 2019 – 8, 2020 – 10.*Number of international students who shall complete courses under mobility: programmes/online:*2016 – 0/0, 2017 - 0/1, 2018 – 2/4, 2019 - 3/5, 2020 – 5/8. | Nazarov, I.V. |
| 2.1.3.9. | Adding courses taught in English to the curriculum of the ‘Electronic Engineering’ Master’s programme | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 3/0, 2017 – 4/0, 2018 – 5/0, 2019 – 6/0, 2020 – 7/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 0, 2017 – 2, 2018 – 4, 2019 – 7, 2020 – 10.*Number of international students who shall complete courses under mobility programmes/online*2016 – 0/0, 2017 – 1/1, 2018 – 2/3, 2019 – 3/5, 2020 – 4/7. | Yurin, A.I. |
| 2.1.3.10. | Adding courses taught in English to the curriculum of the ‘Applied Physics’ Master’s programme |  | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 2/0, 2017 – 3/0, 2018 – 4/0, 2019 – 5/0, 2020 – 6/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 2, 2017 –3, 2018 – 5, 2019 – 7, 2020 – 9.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0/0, 2017 – 0/1, 2018 – 2/5, 2019 – 3/10, 2020 – 2/15. | Popova, E.A.  |
| 2.1.3.11. | Adding courses taught in English to the curriculums of the ‘Applied Mathematics’ undergraduate programme, ‘Computer Security’ specialist programme, and the following Master’s programmes: ‘Management Systems and Information Processing in Engineering’ and ‘Mathematical Methods of Modelling and Computer Technologies’ | Х | Х | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2016 – 11/0, 2017 – 10/0, 2018 – 15/0, 2019 – 16/0, 2020 – 17/0.*Number of students who add English-taught courses to their individual curriculum:* 2016 – 1, 2017 – 3, 2018 – 5, 2019 – 7, 2020 – 10.*Number of international students who shall complete courses under mobility programmes/online:*2016 – 0/3, 2017 – 0/7, 2018 – 1/10, 2019 – 2/15, 2020 – 3/20. | Belov, A.V. |
| 2.1.3.12. | Adding courses taught in English to the curriculum of the ‘Informatics and Computing Equipment’ undergraduate programme |  |  |  | Х | Х | Х | *Number of new courses delivered in English (total/online):*2018 – 3/1, 2019 – 3/1, 2020 – 4/2.*Number of students who add English-taught courses to their individual curriculum:* 2018 – 150, 2019 – 200, 2020 – 200. | Starykh, V.A. |
| 2.1.3.13. | Adding courses taught in English to the curriculum of the ‘Computer Systems and Networks’ Master’s programme |  |  | Х | Х | Х | Х | *Number of new courses delivered in English (total/online):*2017 – 1/1, 2018 – 1/1, 2019 – 2/1, 2020 – 3/1.*Number of students who add English-taught courses to their individual curriculum:* 2017 – 5, 2018 – 10, 2019 – 15, 2020 – 25. | Starykh, V.A. |
| 2.1.4. | Developing research and project components in educational programmes, as well as involving (doctoral) students in research projects carried out by the STRA-U |  |  |  |  |  |  |  |  |
| 2.1.4.1. | Involving (doctoral) students in the STRA-U’s research and study groups  | Х | Х | Х | Х | Х | Х | Research and study groups in mathematics*Number of (doctoral) students working in a research subdivision:*2016 – 10, 2017 – 10, 2018 – 10, 2019 – 10, 2020 – 10.Research and study groups in computer science*Number of (doctoral) students working in a research subdivision:*2016 – 11, 2017 – 12, 2018 – 12, 2019 – 13, 2020 – 14.Research and study groups in physics*Number of (doctoral) students working in a research subdivision:*2016 – 9, 2017 – 7, 2018 – 9, 2019 – 10, 2020 – 11. | Arutyunov, K.Y.Zhukov, L.E.Ignatov, D.I. |
| 2.1.4.2. | Involving (doctoral) students in projects of the STRA-U’s research and teaching laboratories and international laboratories  | Х | Х | Х | Х | Х | Х | International Laboratory of Representation Theory and Mathematical Physics*Number of (doctoral) students working in a research subdivision:*2016 – 4, 2017 – 5, 2018 – 5, 2019 – 5, 2020 – 5.Laboratory of Algebraic Geometry and its Applications*Number of (doctoral) students working in a research subdivision:*2016 – 4, 2017 – 5, 2018 – 5, 2019 – 5, 2020 – 5.Laboratory of Process-Aware Information Systems*Number of (doctoral) students working in a research subdivision:*2016 – 4, 2017 – 5, 2018 – 6, 2019 – 6, 2020 - 7.International Laboratory for Intelligent Systems and Structural Analysis*Number of (doctoral) students working in a research subdivision:* 2016 – 4, 2017 – 5, 2018 – 6, 2019 – 6, 2020 – 7.[Laboratory of Methods for Big Data Analysis](https://cs.hse.ru/en/lambda/)*Number of (doctoral) students working in a research subdivision:*2016 – 4, 2017 – 5, 2018 – 6, 2019 – 7, 2020 - 8.Laboratory of Theoretical Computer Science*Number of (doctoral) students working in a research subdivision:*2016 – 6, 2017 – 6, 2018 – 7, 2019 – 7, 2020 – 7. | Lomazova, I.A.Kuznetsov, S.O.Vereshchagin, N.K.Ustyuzhanin, A.E.Feigin, B.L.Bogomolov, F.A. |
| 2.1.4.3. | Engaging (doctoral) students in research projects | Х | Х | Х | Х | Х | Х | Project: ‘Machine Learning and Data Mining with Applications in Information Technology, High Energy Physics, Biology, Medicine and Neuroscience’*Partners:* Skoltech, Yandex Company, CERN*Number of (doctoral) students engaged in a research project:* 2016 – 4, 2017 – 6, 2018 – 7, 2019 – 8, 2020 – 8.Project: ‘Electronics Based on Quantum Effects’*Partners:* Dorodnicyn Computing Centre (RAS), RAS Research Centre in Chernogolovka, V.A. Trapeznikov Institute of Control Sciences, Space Research Institute (RAS)*Number of (doctoral) students engaged in a research project:*2016 - 11, 2017 – 16, 2018 – 17, 2019 – 21, 2020 – 27. | Kuznetsov, S.O. Ustyuzhanin, A.E.Arutyunov, K.Y. |
| 2.1.4.4. | Engaging (doctoral) students in grant projects | Х | Х | Х |  |  |  | Grant: ‘Developing New Methods of In-Depth Learning in Studying Big Data’*Partners:* Skoltech, Lomonosov MSU, Dresden University of Technology*Number of (doctoral) students engaged in a grant project:*2016 - 1.Grant: ‘Development of Compositional Behavioural Analysis Methods for Distributed Systems with Mobile Agents’*Number of (doctoral) students engaged in grant project:*2016 - 8, 2017 – 8.Grant: ‘Algorithms and Software for the Analysis of Business Processes in Public Services Provision’*Number of (doctoral) students engaged in grant project:*2016 - 0, 2017 – 1.Grant: ‘Endogenous Increase of Brain-Computer Interface Efficacy’*Partners:* National Research Center ‘Kurchatov Institute’Grants awarded Faculty of Mathematics staff, including subsidies from the Russian Science Foundation, Russian Foundation for Basic Research and presidential grants.*Number of (doctoral) students engaged in grant project:*2016 - 8, 2017 – 10. | Vetrov, D.P.Dvorzhansky, L.V.Kalenkova, A.A.Ossadtchi, A.E.Timorin, V.A. |
| 2.2. | Developing academic mobility programmes for students |  |  |  |  |  |  |  |  |
| 2.2.1. | Under agreements |  |  |  |  |  |  |  |  |
| 2.2.1.1. | Student exchange agreement with Aalto University (Finland) | Х | Х | Х | Х | Х | Х | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 1 2017 – 1, 2018 – 1, 2019 – 2, 2020 – 2. | Silantiev, S.A. |
| 2.2.1.2. | Agreement on student exchanges and double-degree programme with Université Blaise Pascal (France) |  | Х | Х | Х | X | X | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 2, 2017 – 2, 2018 – 2, 2019 – 2, 2020 – 2. | Silantiev, S.A. |
| 2.2.1.3. | Student exchange agreement withBologna University (Italy) |  |  | X | X | X | X | Long-term programmes*Number of students taking part in long-term programmes:*2017 – 1, 2018 – 1, 2019 – 1, 2020 – 1. | Silantiev, S.A. |
| 2.2.1.4. | Student exchange agreement withRadboud University (Nijmegen, Netherlands)  | Х | Х | Х | Х | X | X | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 1, 2017 – 1, 2018 – 2, 2019 – 2, 2020 – 2.Short-term programmes (up to 1 month)*Number of students taking part in short-term programmes:*2016 - 1, 2017 – 2, 2018 – 2, 2019 – 3, 2020 – 3. | Silantiev, S.A.Belov, A.V. |
| 2.2.1.5. | Student exchange agreement with SeoulTech (South Korea) |  | Х | X | X | X | X | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 0, 2017 – 1, 2018 – 1, 2019 – 1, 2020 – 1.Short-term programmes (up to 1 month)*Number of students taking part in short-term programmes:*2016 - 1, 2017 – 1, 2018 – 2, 2019 – 2, 2020 – 3. | Silantiev, S.A. Belov, A.V. |
| 2.2.1.6. | Student exchange agreement withUniversity of Groningen (Netherlands) |  |  | Х | Х | Х | Х | Long-term programmes*Number of students taking part in long-term programmes:*2017 – 1, 2018 – 1, 2019 – 2, 2020 – 2. | Silantiev, S.A.  |
| 2.2.1.7. | Student exchange agreement with Korea Institute of Science and Technology (South Korea) |  |  | Х | Х | Х | Х | Long-term programmes*Number of students taking part in long-term programmes:*2017 – 0, 2018 – 0, 2019 – 1, 2020 – 1. | Silantiev, S.A. |
| 2.2.1.8. | Student exchange agreement with University of Central Lancashire (Cyprus) |  | Х | Х | Х | Х | Х | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 0, 2017 – 0, 2018 – 1, 2019 – 1, 2020 – 1. | Silantiev, S.A. |
| 2.2.1.9. | Student exchange agreement withDresden University of Technology (Germany) |  | Х | Х | Х | Х | Х | Long-term programmes*Number of students taking part in long-term programmes:*2016 – 0, 2017 – 0, 2018 – 1, 2019 – 2, 2020 – 2. | Silantiev, S.A. |
| 2.2.1.10. | Student exchange agreement withHumbolt University (Germany) |  | Х | Х | Х | Х | Х | Short-term programmes (up to 1 month)*Number of students taking part in short-term programmes:*2016 - 2, 2017 – 2, 2018 – 3, 2019 – 3, 2020 – 3, | Belov, A.V. |
| 2.2.1.11. | Student exchange agreement with:Universities of Tokyo, Leiden and Luxembourg, Université de Nantes, École polytechnique (Paris), École normale supérieure (Paris), etc. | Х | Х | Х | Х | Х | Х | Short-term programmes (up to 1 month)*Number of students taking part in short-term programmes (at any destination, by number of exchange programme directives):*2016 – 20, 2017 – 25, 2018 – 25, 2019 – 30, 2020 – 30.Long-term programmes*Number of students taking part in long-term programmes (at any destination, by number of exchange programme directives):*2016 – 2, 2017 – 2, 2018 – 3, 2019 – 3, 2020– 3. | Timorin, V.A.Esterov, A.I. |
| 2.3. | Attracting talented prospective students |  |  |  |  |  |  |  |  |
| 2.3.1. | Efforts to attract foreign prospective students to undergraduate and Master’s programmes (career fairs, academic events, Olympiads, etc.) |  |  |  |  |  |  |  |  |
| 2.3.1.1. | Olympiad ‘International Mathematical Tournament of Towns’ |  | Х | Х | Х | Х | Х | *Partners:* Centre of Olympiads in Mathematics – ‘Tournament of Towns’*Markets:* CIS, Eastern Europe (Serbia, Croatia, Bulgaria, Poland, Slovenia, Albania), Israel, Iran, Argentina, Peru, Colombia, Mexico, Indonesia, Malaysia, Singapore, South Korea, Taiwan, Mongolia, Vietnam, US, Canada, Australia, France, Germany, Austria, Spain, Sweden, etc.*Number of international participants at the event:*2016 – 1100, 2017 – 1200, 2018 – 1300, 2019 – 1400, 2020 – 1400. | Timorin, V.A.Esterov, A.I. |
| 2.3.1.2. | Summer conference for winners of the ‘International Mathematical Tournament of Towns’ competition |  | Х | Х | Х | Х | Х | *Partners:* Centre of Olympiads in Mathematics ‘Tournament of Towns’*Markets:* CIS, Eastern Europe (Serbia, Croatia, Bulgaria, Poland, Slovenia, Albania), Israel, Iran, Argentina, Peru, Colombia, Mexico, Indonesia, Malaysia, Singapore, South Korea, Taiwan, Mongolia, Vietnam, US, Canada, Australia, France, Germany, Austria, Spain, Sweden, etc.*Number of international participants at the event:*2016 – 10, 2017 – 10, 2018 – 15, 2019 – 15, 2020 – 20 | Timorin, V.A.Esterov, A.I. |
| 2.3.1.3. | ‘Math in Moscow’ student exchange programme  | Х | Х | Х | Х | Х | Х | *Partners:* Moscow Center for Continuous Mathematical Education, Independent University of Moscow, American Mathematical Society*Markets:* US, Canada, France, Switzerland, UK*Number of international participants at the event:*2016 – 24, 2017 – 28, 2018 – 32, 2019 – 36, 2020 – 40. | Timorin, V.A.Esterov, A.I. |
| 2.3.1.4. | Mathematics courses delivered for HSE Summer University, REU internship programme: Research Experience for Undergraduates |  |  | Х | Х | Х | Х | *Partners:* *Markets:* US, Canada, France, Switzerland, UK, etc.*Number of international participants at the event:*2017 – 2, 2018 – 3, 2019 – 3, 2020 – 3. | Timorin, V.A.Esterov, A.I. |
| 2.3.1.5. | Summer School ‘Contemporary Mathematics’ |  |  | Х | Х | Х | Х | *Partners:* RAS, Steklov Mathematical Institute (RAS), Moscow Department of Education, Moscow Center for Continuous Mathematical Education*Markets:* CIS*Number of international participants of the event:*2017 – 10, 2018 – 10, 2019 – 10, 2020 – 10. | Timorin, V.A.Esterov, A.I. |
| 2.3.1.6. | Annual Summer school on Machine Learning in High Energy Physics | Х |  | Х | Х | Х | Х | *Partners:* Skoltech, CERN, Lund University*Markets:* Ukraine, Kazakhstan, Belarus, Finland, India, Brazil, etc.*Number of international participants at the event:*2016 – 32, 2017 – 33, 2018 – 36, 2019 – 38, 2020 – 40. | Ustyuzhanin, A.E., Glazistov, A.V. |
| 2.3.1.7. | Summer school for international prospective students |  |  | Х | Х | Х | Х | *Markets:* Ukraine, Kazakhstan, Armenia, Belarus, Latvia, Vietnam, etc.*Number of international participants of the event*2017 – 50, 2018 – 60, 2019 – 65, 2020 – 70. | Vlasenko M.Y., Silantiev, S.A. |
| 2.3.2. | Efforts to attract Russian prospective students to undergraduate and Master’s programmes (career guidance, academic events, Olympiads) |  |  |  |  |  |  |  |  |
| 2.3.2.1. | Summer school ‘Contemporary Mathematics’, summer camp in mathematics (including 57 secondary schools), summer and winter schools at ‘Berendeyevy Polyany’ recreation centre, Intel-Avangard, the summer conference of the ‘Tournament of Towns’, Kirovskaya Summer School on Mathematics | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 200, 2017 – 240, 2018 – 300, 2019 – 340, 2020 – 350. | Timorin, V.A.Esterov, A.I. |
| 2.3.2.2. | Career fairs at top mathematical schools  | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 50, 2017 – 60, 2018 – 70, 2019 – 80, 2020 – 100. | Timorin, V.A.Esterov, A.I. |
| 2.3.2.3. | Mathematical clubs in various Moscow districts (based out of 2-3 secondary schools) | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 90, 2017 – 100, 2018 – 110, 2019 – 130, 2020 – 150. | Timorin, V.A.Esterov, A.I. |
| 2.3.2.4. | Holding and contributing to Olympiads in mathematics for secondary school students (Vysshaya Proba in Mathematics, Moscow Mathematical Olympiad and the Tournament of Towns). | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 14000, 2017 – 15500, 2018 – 16300, 2019 – 16800, 2020 – 17600. | Timorin, V.A.Esterov, A.I. |
| 2.3.2.5. | Summer school in computer science for 8-10 grade students (this event is aimed at secondary school students so as to involve them in the All-Russian Olympiad for Secondary School Students and other competitions in computer science, and teaching them machine-learning methods)  | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 35, 2017 – 60, 2018 – 75, 2019 – 100, 2020 – 110. | Vlasenko M.Y.Podolskaya, O.V.Kulikova, D.V. |
| 2.3.2.6. | Programmer’s Day | Х |  | Х | Х | Х | Х | *Number of event participants:*2016 – 400, 2017 – 430, 2018 – 480, 2019 – 530, 2020 – 550. | Vlasenko M.Y. |
| 2.3.2.7. | Career guidance lectures ‘I’m an IT guy’ (‘Я – Айтишник’) at base schools  |  | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 200, 2017 – 300, 2018 – 400, 2019 – 500, 2020 – 600. | Vlasenko M.Y. |
|  | Career guidance lectures for Lyceum students | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 30, 2017 – 30, 2018 – 30, 2019 – 30, 2020 – 30. | Kulikova, D.V. |
| 2.3.2.8. | Computer Science Days | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 800, 2017 – 870, 2018 – 930, 2019 – 970, 2020 – 1000. | Vlasenko M.Y. |
| 2.3.2.9. | Open Days for undergraduate and Master’s programmes | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 950, 2017 – 1050, 2018 – 1150, 2019 – 1250, 2020 – 1350. | Belov, A.V. |
| 2.3.2.10. | Field-specific Olympiads at partner universities in various Russian regions  | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 90, 2017 – 120, 2018 – 130, 2019 – 150, 2020 – 170. | Belov, A.V. |
| 2.3.2.11. | Summer school in technology ‘Ahead of the Times’ (‘Operezhaya vremya’) for secondary school students | Х | Х | Х | Х  | Х | Х | *Number of event participants:*2016 – 95, 2017 – 110, 2018 – 120, 2019 – 125, 2020 – 125.  | Belov, A.V. |
| 2.3.2.12. | Winter school in technology for students and graduates | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 50, 2017 – 60, 2018 – 70, 2019 – 80, 2020 – 80. | Belov, A.V. |
| 2.3.2.13. | Student conference named after E. V. Armensky | Х | Х | Х | Х | Х | Х | *Number of event participants:*2016 – 310 2017 – 330, 2018 – 340, 2019 – 350, 2020 – 360. | Belov, A.V. |
| 2.4. | Developing continuing education programmes (CPD) |  |  |  |  |  |  |  |  |
| 2.4.1. | Designing and developing CPD for high school teachers  |  | Х | Х | Х | Х | Х | *Partners:* Center for Teaching Excellence*Mode of studies:* full-time*Number of learners enrolled in CPD programmes:*2016 – 50, 2017 – 75, 2018 – 100, 2019– 100, 2020 – 100. | Timorin, V.A.Esterov, A.I. |
| 2.4.2 | Designing and developing the ‘Introduction to Machine Learning and Data Mining’ CPD |  | Х | Х | Х | Х | Х | *Mode of study:* part-time*Number of learners enrolled in CPD programmes:*2016 – 18, 2017 – 25, 2018 – 30, 2019 – 30, 2020 – 30.  | Ignatov, D.I. Yelizarov, S.V.Vlasenko M.Y. |
| 2.4.3 | Designing and developing the ‘Regression Data Mining in SPSS’ CPD |  | Х | Х | Х | Х | Х | *Mode of study:* part-time*Number of learners enrolled in CPD programmes:*2016 – 11, 2017 – 25, 2018 – 30, 2019 – 30, 2020 – 30.  | Melikyan, A.V.Vlasenko, M.Y. |
| 2.4.4 | Designing and developing the ‘Recommender Systems and Algorithms’ CPD |  | Х | Х | Х | Х | Х | *Mode of study:* part-time*Number of learners enrolled in CPD programmes:*2016 – 11, 2017 – 20, 2018 – 30, 2019 – 30, 2020 – 30. | Ignatov, D.I.Vlasenko M.Y. |
| 2.4.5 | Designing and developing the ‘Python as a First Programming Language’ CPD |  | Х | Х |  |  |  | *Mode of study:* part-time*Number of learners enrolled in CPD programmes:*2016 – 18, 2017 – 10. | Pavlyuk, L.V.Vlasenko, M.Y. |
| 2.4.6 | Designing and developing the ‘Text Mining’ CPD |  | Х | Х | Х | Х | Х | *Mode of study:* part-time*Number of learners enrolled in CPD programmes:*2016 – 18, 2017 – 20, 2018 – 20, 2019 – 20, 2020 – 20. | Chernyak, E.V.Vlasenko M.Y. |
| 2.4.7 | Designing and developing the ‘Contemporary Methods and Techniques for Analyzing Big Data’ CPD |  | Х | Х | Х | Х | Х | *Partners:* CJSC EC-Leasing*Mode of study:* full-time*Number of learners:*2016 – 15, 2017 – 25, 2018 – 35, 2019 – 40., 2020 – 40. | Starykh, V.A., Shmid, A.V., Pozin, B.A. |
|  | **3. Development of R&D and Innovation-Focused Activities** |
| 3.1. | Research projects |  |  |  |  |  |  |  |  |
| 3.1.1. | *Project*: ‘System for Intellectual Analysis of STI Aimed at Identifying Emerging Trends and Opportunities’ |  |  | Х | Х | Х | Х | *Partners* *Universities:* National Research Nuclear University MEPhI, University of Manchester, Georgia Institute of Technology *Research organizations:* Research Institute ‘Institute named after N.E. Zhukovsky’, Technological Institute for Superhard and Novel Carbon Materials, Research Institute of Economics in the Aviation Industry, All-Russian Research Institute of Aviation Materials, Kharkevich Institute, Center for Strategic Studies and Management in Science Technology and Innovation (Brazil)*Companies:* Rosatom, United Rocket and Space Corporation, State Space Corporation Roscosmos, and Gazprom*Project publications:*2017 – 4, 2018 – 6, 2019 – 9, 2020 – 12.*Presentations of project-related reports at conferences:*2017 – 3, 2018 – 3, 2019 – 4, 2020 – 5. | Gokhberg, L.M.Kuznetsov, S.O.Mirkin, B.G.Lomazova, I.A.Obiedkov, S.A. |
| 3.1.2. | *Project:* ‘Machine Learning and Data Mining with Applications in Information Technology, High Energy Physics, Biology, Medicine and Neuroscience’ *Subproject*: ‘Mining Data with Complex Structure and Semantic Technologies’ |  |  | Х | Х | Х | Х | *Partners* *Universities:* Lomonosov Moscow State University, Skoltech, University of Essex, INRIA Paris*Research organizations* Microsoft Research*Companies:* CERN, Google Deep Mind, Sberbank, JetBrains, Kaspersky Laboratory, Yandex, Samsung, Schlumberger*Project publications:*2017 – 3, 2018 – 3, 2019 – 3, 2020 – 4.*Presentations of project-related reports at conferences:*2017 – 3, 2018 – 3, 2019 – 3, 2020 – 4. | Kuznetsov, S.O.Ustyuzhanin, A.E.Vetrov, D.P. |
| 3.1.3. | *Project:* ‘Algebraic Geometry, Representation Theory and Mathematical Physics’*Subproject:* ‘Characteristic Classes and Representation Theory’*Subproject:* ‘Algebra, Geometry and Combinations of Integrated Systems’ *Subproject:* ‘Geometry and Representation Theory between Lie Algebra and Quiver Theory’  |  | Х | Х | Х | Х | Х | *Partners* *Universities:* Kyoto University*Research organizations:* Steklov Mathematical Institute (RAS), Kharkevich Institute, Lebedev Physical Institute (RAS)*Project publications:*2016 – 42, 2017 – 50, 2018 – 52, 2019 – 54, 2020 – 56.*Presentations of project-related reports at conferences:*2016 – 50, 2017 – 60, 2018 – 65, 2019 – 70, 2020 – 70. | Kuznetsov, A.G.Feigin, B.L. |
| 3.1.4. | *Project:* ‘Mathematical Methods in Theoretical Computer Science’ |  | Х | Х | Х | Х | Х | *Partners* *Research organizations:* Steklov Mathematical Institute (RAS)*Project publications:*2016 – 7, 2017 – 9, 2018 – 9, 2019 – 10, 2020 – 10.*Presentations of project-related reports at conferences:*2016 – 5, 2017 – 6, 2018 – 6, 2019 – 7, 2020 – 7. | Vereshchagin, N.K.Podolsky, V.V. |
| 3.1.5. | *Project: ‘*Process Mining: Modelling and Analysis of Information Systems Based on Their Real Behaviour’ *Subproject:* ‘Designing Distributed Process-Oriented Information Systems and Analyzing Their Behaviour’  |  | Х | Х | Х | Х | Х | *Partners* *Universities:* Eindhoven University of Technology*Project publications:*2016 – 6, 2017 – 7, 2018 – 7, 2019 – 8, 2020 – 8.*Presentations of project-related reports at conferences:*2016 – 4, 2017 – 4, 2018 – 5, 2019 – 5, 2020 – 5. | Lomazova, I.A. |
| 3.1.6. | *Project: ‘*Mathematical an Computer Modelling’*Subproject:* ‘Mathematical Physics of Complex Systems’*Subproject:* ‘Temperature and Field Dependence of the Non-Stationary Mobility of Charge Carriers in Molecularly Doped Polymers’*Subproject:* ‘Quantum Cooperative Phenomena at Low Temperatures’ |  | Х | Х | Х | Х | Х | *Partners* *Universities:* National University of Science and Technology MISIS and Irkutsk National Research Technical University*Research organizations* Dorodnicyn Computing Centre (RAS), Space Research Institute (RAS), Joint Institute for High Temperatures (RAS)*Companies:* Research and Manufacturing Association named after S.A. Lavochkin*Project publications:*2016 – 6, 2017 – 8, 2018 – 10, 2019 – 12, 2020 – 15.*Presentations of project-related reports at conferences*2016 – 9 , 2017 – 12, 2018 – 14, 2019 – 16, 2020 – 18. | Karasev, M.V.Shchur, L.N.Pozhidaev, E.D.Arutyunov, K.Y. |
| 3.2. | Developing research infrastructure |  |  |  |  |  |  |  |  |
| 3.2.1. | Mirror Symmetry and Categorical Kähler Geometry research |  |  | Х | Х | Х | Х | *Project publications:*2017 – 10, 2018 – 15, 2019 – 20, 2020 – 25.*Presentations of project-related reports at conferences*2017 – 15, 2018 – 20, 2019 – 25, 2020 – 30. | Timorin, V.A. |
| 3.2.2. | Neuro-Bayesian approach to Machine Learning research |  |  | Х | Х | Х | Х | *Project publications:*2017 – 4, 2018 – 5, 2019 – 5, 2020 – 64.*Presentations of project-related reports at conferences*2017 – 5, 2018– 6, 2019– 7, 2020 – 8. | Vetrov, D.P. |
| 3.2.3. | Developing applied R&D | Х | Х | Х | Х | Х | Х | Revenues of the STRA-U’s subdivisions from applied R&D projects:2016 – approx. RUB 60,6 million, 2017 – approx. RUB 62,0 million, 2018 – approx. RUB 63,0 million, 2019 – approx. RUB 64,0 million, 2020 – approx. RUB 66,0 million | Timorin, V.A.Obiedkov, S.A.Aksenov, S.A. |
| 3.3. | Holding academic events |  |  |  |  |  |  |  |  |
| 3.3.1. | Holding conferences |  |  |  |  |  |  |  |  |
| 3.3.1.1. | International conferences in mathematics held by the STRA-U’s associated subdivisions  | Х | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the conference:*2016 – 600/100, 2017 – 650/100, 2018 – 680/100, 2019 – 680/100, 2020 – 700/100.*Number of students/doctoral students taking part in the conference:*2016 – 150/50, 2017 – 170/50, 2018 – 190/50, 2019 – 200/60, 2020 – 220/60. | Timorin, V.A.Feigin, E.B. |
| 3.3.1.2. | A.P. Ershov Informatics Conference |  |  | Х | Х | Х | Х | *Number of participants/foreign participants at the conference:*2017 – 250/60, 2018 – 250/60, 2019 – 300/70, 2020 – 300/70.*Number of students/doctoral students taking part in the conference:*2017 – 50, 2018 – 50, 2019 – 60, 2020 – 60. | Grinkrug, E.M.Petrenko, A.K. |
| 3.3.1.3. | International Conference on Concept Lattices and Their Applications | Х |  |  |  |  |  | *Number of participants/foreign participants at the conference:*2016 – 70/50.*Number of students/doctoral students taking part in the conference:*2016 – 12. | Kuznetsov, S.O. |
| 3.3.1.4. | Conferences and seminars on theoretical computer science | Х |  | Х | Х | Х | Х | *Number of participants/foreign participants at the conference:*2016 – 40/14, 2017 – 40/5, 2018 – 45/5, 2019 – 45/5, 2020 – 50/6.*Number of students/doctoral students taking part in the conference:*2016 – 5, 2017 – 6, 2018 – 8, 2019 – 10, 2020 – 12. | Podolsky, V.V. |
| 3.3.1.5. | Conference – ‘Computer Simulations in Physics and Beyond’ |  |  | Х |  | Х |  | *Number of participants/foreign participants at the conference:*2017 – 150/15, 2019 – 200 /20*Number of students/doctoral students taking part in the conference:*2017 – 24, 2019 – 30. | Belov, A.V.Shchur, L.N. |
| 3.3.1.6. | Conference – ‘Supercomputer Simulations in Science and Engineering’ |  | Х |  | Х |  | Х | *Number of participants/foreign participants at the conference*2016 – 100/3, 2018 – 150/6, 2020 – 150 /10.*Number of students/doctoral students taking part in the conference:*2016 – 20, 2018 – 25, 2020 – 30. | Belov, A.V.Shchur, L.N. |
| 3.3.1.7. | International conference - ‘Current Issues in System and Software Engineering’  |  |  | Х |  | Х |  | *Number of participants/foreign participants at the conference:*2017 – 200/50, 2019 – 200/50.*Number of students/doctoral students taking part in the conference:*2017 – 50, 2019 – 50. | Starykh, V.A.Pozin, B.A. |
| 3.3.1.8. | XVII International Conference – ‘Data Analytics and Management in Data Intensive Domains’ (DAMDID/RCDL) |  | Х |  |  |  |  | *Number of participants/foreign participants at the conference:*2016 – 200/70.*Number of students/doctoral students taking part in the conference:*2016 – 70. | Starykh, V.A. Pozin, B.A. |
| 3.3.1.9. | ХII International IEEE Siberian Conference on Control and Communications | Х |  |  |  |  |  | *Number of participants/foreign participants at the conference:*2016 – 183/9.*Number of students/doctoral students taking part in the conference:*2016 – 17. | Lvov, B.G. |
| 3.3.2. | Holding research seminars on a regular basis |  |  |  |  |  |  |  |  |
| 3.3.2.1 | Joint research seminars of Faculty of Computer Science and MIEM HSE |  | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the event:*2016 – 40/2, 2017 – 80/3, 2018 – 85/4, 2019 – 90/5, 2020 – 95/6.*Number of students/doctoral students taking part in the event:*2016 – 4, 2017 – 8, 2018 – 10, 2019 – 15, 2020 – 20. | Obiedkov, S.A.Aksenov, S.A. |
| 3.3.2.2. | Weekly seminars on fundamental mathematics held by research laboratories and the STRA-U’s associated subdivisions  | Х | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the event:*2016 – 1500/90, 2017 – 1500/90, 2018 – 1600/100, 2019 – 1600/100, 2020 – 1650/100.*Number of students/doctoral students taking part in the event:*2016 – 850/20, 2017 – 850/20, 2018 – 900/20, 2019 – 900/25, 2020 – 950/25. | Timorin, V.A.Feigin, E.B. |
| 3.3.2.3. | Colloquium of the Faculty of Computer Science | Х | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the event:*2016 – 500/5, 2017 – 600/6, 2018 – 700/7, 2019 – 700 /7, 2020 – 700 /8*Number of students/doctoral students taking part in the event:*2016 – 250, 2017 – 300, 2018 – 350, 2019 – 375, 2020 – 400. | Obiedkov, S.A. |
| 3.3.2.4. | IT Lectures | Х | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the event:*2016 – 320/0, 2017 – 325/1, 2018 – 330/1, 2019 – 335/2, 2020 – 340/2.*Number of students/doctoral students taking part in the event:*2016 – 160, 2017 – 165, 2018 – 170, 2019– 175, 2020 – 180. | Vlasenko M.Y. |
| 3.3.2.5. | Research seminars held at laboratories | Х | Х | Х | Х | Х | Х | *Number of participants/foreign participants at the event:*2016 – 60/3, 2017 – 65/5, 2018 – 70/7, 2019 – 75/7, 2020 – 80/9.*Number of students/doctoral students taking part in the event:*2016 – 175, 2017 – 270, 2018 – 290, 2019 – 290, 2020 – 320. | Lomazova, I.A.Kuznetsov, S.O.Vereshchagin, N.K.Ustyuzhanin, A.E. |
| 3.4. | Providing support to publishing activities  |  |  |  |  |  |  |  |  |
| 3.4.1.1. | Publishing preprints for the Cornwell University series | Х | Х | Х | Х | Х | Х | *Area of focus:* Mathematics*Number of preprints published in English:*2016 – 50 , 2017 – 50 , 2018 – 50, 2019 - 50, 2020 – 50. | Timorin, V.A.Feigin, E.B. |
| 3.4.1.2. | Involvement of STRA-U staff on the editorial boards of leading international journals in the unit’s areas of focus | Х | Х | Х | Х | Х | Х | *Number of employees on the editorial boards of leading international journals:* 2016 – 24, 2017 – 26, 2018 – 26 , 2019– 26, 2020 – 26. | Timorin, V.A.Feigin, E.B.Obiedkov, S.A.Aksenov, S.A. |
| 3.5. | Implementing innovation-driven programmes |  |  |  |  |  |  |  |  |
| 3.5.1. | National patents for utility models, certificates of state registration  |  | Х | Х | Х | Х | Х | *Area of focus:* mathematical modelling, supercomputer modelling of complex systems*Partners*: Dorodnicyn Computing Centre (RAS), RAS Research Centre in Chernogolovka*Number of certificates and patents:*2016 – 3, 2017 – 4, 2018 -5, 2019 – 5, 2020 – 5. | Lvov, B.G. |
| 3.5.2. | Patents issued by the Russian Federation, Rospatent certificates  |  | Х | Х | Х | Х | Х | *Area of focus:* mathematical modelling, supercomputer modelling of complex systems*Partners*: Dorodnicyn Computing Centre (RAS), RAS Research Centre in Chernogolovka*Number of certificates and patents:*2016 – 1, 2017 – 1, 2018 – 1, 2019 – 1, 2020 – 1. | Lvov, B.G. |
| 3.5.3. | Certificates on software and databases |  | Х | Х | Х | Х | Х | *Area of focus:* developing applied software at the request of external institutions and for internal use (curriculum support) *Partners*: Dorodnicyn Computing Centre (RAS), RAS Research Centre in Chernogolovka, Yandex, Institute for System Programming (RAS)*Number of certificates:*2016 - 2, 2017 - 5, 2018 - 6, 2019 - 6, 2020 – 6. | Starykh, V.A.Avdoshin, S.M. Kuznetsov, S.O. |
| **4. HR Policy** |
| 4.1. | Hiring of academic staff (teachers and researchers) on the global academic market |  |  |  |  |  |  |  |  |
| 4.1.1. | Hiring of academic staff (teachers and researchers) to the Faculty of Mathematics  | Х | Х | Х | Х | Х | Х | *Number of academic staff members hired as associate professors, professors and research fellows:* 2016 – 2, 2017 – 2, 2018 – 2 , 2019 – 2, 2020 – 2. | Timorin, V.A. |
| 4.1.2. | Hiring of academic staff (teachers and researchers) to the Faculty of Computer Science | Х | Х | Х | Х | Х | Х | *Number of academic staff members:*2016 – 3, 2017 – 2, 2018 – 2, 2019 – 2, 2020 – 2. | Arzhantsev, I.V. |
| 4.1.3. | Hiring of academic staff (teachers and researchers) to MIEM HSE | Х | Х | Х | Х | Х | Х | *Number of academic staff members:*2016 – 1, 2017 –1, 2018 – 1, 2019 – 2, 2020 – 2. | Lvov, B.G. |
| 4.2 | Hiring instructors and researchers from leading field-specific centres and companies in the real sector to provide individual courses and joint educational programmes |  |  |  |  |  |  |  |  |
| 4.2.1. | Educational programmes: undergraduate and Master’s programmes in ‘Mathematics’, ‘Mathematics and Mathematical Physics’Markets: Steklov Mathematical Institute (RAS), Kharkevich Institute, Lebedev Physical Institute (RAS) | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers employed at the STRA-U’s international labs who were hired to deliver courses, supervise research seminars (including international staff):*2016 – 3/1, 2017 – 4/1, 2018 – 5/1, 2019– 5/1, 2020 – 5/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 18, 2017– 18, 2018 – 18, 2019 – 18, 2020 – 18. | Timorin, V.A. |
| 4.2.2. | Educational programme: Master’s programme ‘Data Science’Markets: Yandex School of Data Analysis, Yandex Data Factory, Kharkevich Institute, Algomost Company, Croc Company | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2016 – 37/5, 2017 – 37/5, 2018 – 37/5, 2019 – 40/5, 2020 – 40/5.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 4, 2017 – 4, 2018 – 4, 2019 – 5, 2020 – 5. | Kuznetsov, S.O. |
| 4.2.3. | Educational programme: undergraduate programme ‘Information and Communication Technologies and Communication Systems’Markets: Research Institute of Communication and Control Systems, Scontel, Research and Manufacturing Enterprise ‘Pulsar’, Moscow Research Institute of Radiotechnology, Central Research Radiotechnical Institute named after Academician A.I. Berg | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff)*2016 – 6/0, 2017 – 6/0, 2018 – 6/1, 2019 – 7/1, 2020 – 7/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 6, 2017 – 6, 2018 – 7, 2019 – 8, 2020 – 8. | Nazarov, I.V. Lvov, B.G. |
| 4.2.4. | Educational programme: Master’s programme ‘Electronic Engineering’Markets: S.P. Korolev Rocket and Space Corporation Energia, Scontel, All-Russian Research Institute for Optical and Physical Measurements, Research and Manufacturing Enterprise ‘Pulsar’ | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2016 – 4/0, 2017 – 5/0, 2018 – 5/0, 2019 – 5/1, 2020 – 5/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 4, 2017 – 5, 2018 – 5, 2019 – 6, 2020 – 6. | Yurin, A.I.Lvov, B.G. |
| 4.2.5. | Educational programme: Master’s programme ‘Applied Physics’Markets: Scontel, P.L. Kapitza Institute for Physical Problems (RAS), A.N. Frumkin Institute of Physical chemistry and Electrochemistry (RAS) | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2016 – 4/0, 2017 – 5/0, 2018 – 5/1, 2019 - 5/1, 2020 – 5/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 4, 2017 - 5, 2018 - 6, 2019 – 6, 2020 – 6.  | Popova, E.A.Lvov, B.G. |
| 4.2.6. | Educational programme: ‘Materials, Devices and Nanotechnology’ Master’s programmeMarkets: P.L. Kapitza Institute for Physical Problems (RAS), Landau Institute for Theoretical Physics (RAS), Lebedev Physical Institute, Prokhorov General Physics Institute, Institute for Theoretical and Applied Electrodynamics (RAS), Institute of Solid State Physics (RAS) |  |  | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2017 – 9/0, 2018 – 8/1, 2019 – 7/2, 2020 – 7/2.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2017 – 9, 2018 – 9, 2019 – 9, 2020 – 9. | Bograchev, D.A.Lvov, B.G. |
| 4.2.7. | Educational programme: ‘Quantum Information Technologies’ Master’s programmeMarkets: Skoltech Center of Photonics & Quantum Materials, Research Institute of Nuclear Physics under Moscow State University, Institute of Solid State Physics (RAS) |  |  | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff)*2017 – 10/0, 2018 – 8/2, 2019 – 8/2, 2020 – 8/2*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2017 – 10, 2018 – 10, 2019 – 10, 2020 – 10. | Arutyunov, K.Y.Lvov, B.G. |
| 4.2.8. | Educational programme: ‘Informatics and Computing Equipment’ undergraduate programmeMarkets: IBM Science and Technology Center  |  |  | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2017 – 2/1, 2018 – 2/1, 2019 – 3/1, 2020 – 3/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2017 – 3, 2018 – 3, 2019 – 3, 2020 – 3. | Starykh, V.A. |
| 4.2.9. | Educational programme: ‘Computer Systems and Networks’ Master’s programmeMarkets: IBM Big Data Solution Center (jointly with EC-leasing company) |  |  | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff):*2017 – 2/1, 2018 – 2/1, 2019 – 3/1, 2020 – 3/1.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2017 – 3, 2018 – 3, 2019 – 3, 2020 – 3. | Starykh, V.A. |
| 4.2.10. | Educational programmes: ‘Computer Security’ Specialist programme; the following Master’s programmes: ‘Applied Mathematics’, ‘Management Systems and Information Processing in Engineering’, ‘Mathematical Modelling Methods and Computer Technologies’ and ‘Data Protection in Computer Systems and Networks’Markets: Joint Department with Dorodnicyn Computing Centre (RAS) ‘Applied Information and Communication Systems and Techniques’, Sberbank, Otkritie Bank IBS, Statsoft Russia  | Х | Х | Х | Х | Х | Х | *Number of instructors and researchers hired to deliver courses (including international academic staff)*2016 – 26/1, 2017 – 26/2, 2018 – 28/3, 2019 – 29/3, 2020 – 30/4.*Number of courses delivered by instructors and researchers from leading field-specific centres and the real sector:*2016 – 17, 2017 – 17, 2018 – 20, 2019 – 22, 2020 – 23.  | Belov, A.V. |
| 4.3 | Engaging experts from leading field-specific centres and the real sector of economy in research projects  |  |  |  |  |  |  |  |  |
| 4.3.1. | Project: “System for Intellectual Analysis of STI Aimed at Identifying Emerging Trends and Opportunities”Markets: Rosatom, United Rocket and Space Corporation, State Space Corporation ‘Roscosmos’, Gazprom |  |  | Х | Х | Х | Х | *Number of experts from leading field-specific centres and the real sector of economy (including international academic staff) taking part in research projects*2017 – 14/3, 2018 – 14/3, 2019 – 15/4, 2020 – 15. | Gokhberg, L.M.Kuznetsov, S.O.Mirkin, B.G.Lomazova, I.A.Obiedkov, S.A. |
| 4.3.2. | Project: ‘Algebraic Geometry, Representation Theory and Mathematical Physics’Markets: Steklov Mathematical Institute (RAS), Lebedev Physical Institute (RAS), Kharkevich Institute |  | Х | Х | Х | Х | Х | *Number of experts from leading field-specific centres taking part in research projects (including international staff):*2016 – 19/3, 2017 – 19/3, 2018 – 19/4, 2019 – 19/4, 2020 – 19/4. | Timorin, V.A. |
| 4.3.3. | Project: ‘Machine Learning and Data Mining with Applications in Information Technology, High Energy Physics, Biology, Medicine and Neuroscience’Markets: Yandex Data Factory, Yandex School of Data Analysis, CERN |  |  | Х | Х | Х | Х | *Number of experts from leading field-specific centres and the real sector of economy (including international academic staff) taking part in research projects:*2017 – 5/3, 2018 – 7/5, 2019– 9/7, 2020 – 9/7. | Kuznetsov, S.O.Ustyuzhanin, A.E.Vetrov, D.P. |
| 4.3.4. | Project: ‘Mathematical Methods in Theoretical Computer Science’Markets: Steklov Mathematical Institute (RAS), Kharkevich Institute, Lebedev Physical Institute (RAS) |  | Х | Х | Х | Х | Х | *Number of experts from leading field-specific centres and the real sector of economy (including international academic staff) taking part in research projects:*2016 – 3/1, 2017 – 4/2, 2018 – 5/2, 2019 – 6/2, 2020 – 7/3. | Vereshchagin, N.K.Podolsky, V.V. |
| 4.3.5. | Project: ‘Process Mining: Modelling and Analysis of Information Systems Based on Their Real Behaviour’ Markets: Yandex |  | Х | Х | Х | Х | Х | *Number of experts from leading field-specific centres and the real sector of economy (including international academic staff) taking part in research projects:*2016 – 2/1, 2017 – 3/1, 2018 – 3/1, 2019 – 4/2, 2020 – 4/2. | Lomazova, I.A. |
| 4.3.6. | Project: ‘Mathematical and Computer Modelling’Markets: Dorodnicyn Computing Centre (RAS), Space Research Institute (RAS), Research and Manufacturing Association named after S.A. Lavochkin, Joint Institute for High Temperatures (RAS) |  | Х | Х | Х | Х | Х | *Number of experts from leading field-specific centres and the real sector of economy (including international academic staff) taking part in research projects:*2016 – 3/1, 2017 – 5/1, 2018 – 7/2, 2019 – 8/3, 2020 – 8/3. | Karasev, M.V.Shchur, L.N. |
| 4.4. | Developing postdoc programmes |  |  |  |  |  |  |  |  |
| 4.4.1. | Hiring postdocs from international labour market | Х | Х | Х | Х | Х | Х | *Number of postdocs hired:*2016 – 5, 2017 – 5, 2018 – 6, 2019 – 6, 2020 – 6. | Timorin, V.A.Arzhantsev, I.V. |
| 4.5. | Outgoing academic staff mobility (teachers and researchers) |  |  |  |  |  |  |  |  |
| 4.5.1. | Under agreements: |  |  |  |  |  |  |  |  |
| 4.5.1.1. | Inter-university exchange agreement under the Erasmus+ programme: academic exchange programme for faculty members and administrative staffNova University of Lisbon (Portugal)*Purpose:* academic exchange programme for faculty members and administrative staff | Х | Х | Х |  |  |  | Short-term mobility*Number of employees taking part in short-term programmes:*2016 – 1, 2017 – 0. | Silantiev, S.A. |
| 4.5.1.2. | Inter-university exchange agreement under the Erasmus+ programme: academic exchange programme for students and faculty members Aalto University (Finland)*Purpose:* academic exchange programme for faculty members  | Х | Х | Х | Х | Х | Х | Short-term mobility*Number of employees taking part in short-term programmes:*2016 – 1, 2017 – 2, 2018 – 2, 2019 – 2, 2020– 2.Long-term mobility*Number of employees taking part in long-term programmes:*2016 – 0, 2017 – 0, 2018 – 0, 2019 – 1, 2020 – 1. | Silantiev, S.A. |
| 4.5.1.3.. | Participating in international conferences and academic events | Х | Х | Х | Х | Х | Х | *Number of employees taking part in academic mobility programmes for taking part in international conferences and academic events (as speakers):*2016 – 55, 2017 – 60, 2018 – 65, 2019 – 70, 2020 – 70. | Obiedkov, S.A.Feigin, E.B.Aksenov, S.A. |
| 4.5.3. | Other types of outgoing mobility |  |  |  |  |  |  |  |  |
| 4.5.3.1 | Type of mobility (at the initiative of staff members, under grants awarded by HSE or other organizations, etc.) | Х | Х | Х | Х | Х | Х | *Number of employees taking part in academic mobility programmes:*2016 – 18, 2017 – 30, 2018 – 37, 2019 – 42, 2020 – 47.  | Obiedkov, S.A.Feigin, E.B.Aksenov, S.A. |
| 4.6. | Incoming academic mobility for taking part in educational and research activities |  |  |  |  |  |  |  |  |
| 4.6.1. | Under agreements: |  |  |  |  |  |  |  |  |
| 4.6.1.1. | Agreements on academic exchange withUniversities of Kyoto, Tokyo, Leiden, Luxembourg, École normale supérieure (Paris)*Purpose:* academic exchange programme for faculty members | Х | Х | Х | Х | Х | Х | Short-term mobility*Number of employees taking part in short-term programmes:* 2016 – 100, 2017 – 110, 2018 – 120, 2019 – 120, 2020– 12. | Timorin, V.A. |
| 4.6.1.2. | Inter-university exchange agreement under the Erasmus+ programme: academic exchange programme for faculty members and administrative staffNova University of Lisbon (Portugal)*Purpose:* academic exchange programme for faculty members and administrative staff | Х | Х | Х |  |  |  | Short-term mobility*Number of employees taking part in short-term programmes:*2016 – 0, 2017 – 1. | Silantiev, S.A. |
| 4.6.1.3. | Inter-university exchange agreement under the Erasmus+ programme: academic exchange programme for students and faculty members Aalto University (Finland)*Purpose:* academic exchange programme for faculty members | Х | Х | Х | Х | Х | Х | Short-term mobility*Number of employees taking part in short-term programmes:*2016 – 0, 2017 –0, 2018 – 0, 2019 – 1, 2020 – 1. | Silantiev, S.A. |
| 4.6.2. | Taking part in international conferences and academic events held by HSE | Х | Х | Х | Х | Х | Х | *Number of employees taking part in academic mobility programmes for taking part in HSE international conferences and academic events (as speakers):*2016 – 88, 2017 – 105, 2018 – 118, 2019 – 125, 2020 – 138. | Obiedkov, S.A.Timorin, V.A.Aksenov, S.A. |
| 4.6.2.1. | Taking part in international conferences, as well as in educational and research activities with respect to supercomputer modelling of complex systems  | Х | Х | Х | Х | Х | Х | *Number of employees taking part in academic mobility programmes for taking part in HSE international conferences and academic events (as speakers):*2016 – 1, 2017 – 3, 2018 - 4, 2019 – 5, 2020 – 6. | Belov, A.V., Shchur, L.N. |
| 4.6.3. | Other kinds of incoming mobility |  |  |  |  |  |  |  |  |
| 4.6.3.1 | Type of mobility (at the initiative of staff members, under grants awarded by HSE or other organizations, etc.) | Х | Х | Х | Х | Х | Х | *Number of employees taking part in academic mobility programmes:*2016 – 1, 2017 – 2, 2018 – 3, 2019 – 3, 2020 – 4. | Aksenov, S.A. |
| 4.7. | CPD programmes for academic staff  |  |  |  |  |  |  |  |  |
| 4.7.1 | Pycon Russia Annual Conference - 2016 (Moscow, Russia) |  | Х |  |  |  |  | *Number of academic staff members taking part in CPD programmes:*2016 – 2.  | Voznesenskaya, T.V.Kutylev, S.A. |
| 4.7.2 | ‘Russian as a foreign language’ programmes |  | Х | Х |  |  |  | *Number of academic staff members taking part in CPD programmes:*2016 – 1, 2017 – 1. | Bauwens, B.F. |
| 4.7.3. | ‘University Management of Intellectual Property’ programme |  | Х |  |  |  |  | *Number of academic staff members taking part in CPD programmes:*2016 – 3. | Kaperko, A.F.Zavarin, S.S.Glazistov, A.V. |
| 4.7.4. |  ‘Project management’ programme |  | Х |  |  |  |  | *Number of academic staff members taking part in CPD programmes:*2016 – 4. | Kuznetsova, V.V.Gergart, I.A.Silantiev, S.A.Obolyaeva, N.M. |

\* results of project implementation are approximate and may be adjusted in light of external and internal organizational developments