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Approved by

Chairman of the Advisory Council

\_\_\_\_\_, Shadrikov V.D.

\_\_\_\_\_, 2013

## REPORT

**on the results of the independent assessment of the basic  
professional educational program of higher education**

**010400.68 "Applied Mathematics and Information Science"**

**Federal State Autonomous Educational Institution of Higher  
Professional Education the North-East Federal University (NEFU)  
named after M.K. Ammosov**

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The Master's general education program (OOP) in the training course 010400 "Applied mathematics and computer science" on the master's program "Mathematical Modeling", developed and approved by the institution of higher education to meet the requirements of the labor market on the basis of the Federal State Educational Standard on the relevant field of study of higher professional education (FGOS VPO), has been implemented by "The North-Eastern Federal University named after M.K. Ammosov" since 2011. The Master's general education program in the training course "Applied mathematics and computer science" on the master's program "Mathematical Modeling" has been implemented in the NEFU (YaSU) since 1998.

Qualification awarded: Master's degree in applied mathematics and computer science.

Duration of study: 2 years.

Mode of study: Full-time.

Department which graduates students: Department of Applied Mathematics of the Institute of Mathematics and Computer Science of the NEFU.

Location: 48 Kulakovskii Street, Yakutsk, the Sakha Republic (Yakutia), 677000.

## **CRITERION 1. PROGRAM LEARNING OBJECTIVES**

The educational goal of the Master's general education program, which consists in preparation of graduates to solve professional problems in the chosen field of activity, i.e. research, design, production, technological, organizational, managerial and educational activities related to the use of mathematical modeling, advanced software technologies (parallel programming), information and communication technologies and data processing systems, corresponds to the NEFU's Mission in the preparation of competitive professionals.

The program aims were formulated in view of the labor market demand and they comply with the best practice of this program implementation (the practice of MSU). All participants of the education process are introduced to the aims set in the general education program since the program is in the public domain on the website of the NEFU (<http://s-vfu.ru>) and at the department.

## **CRITERION 2. STRUCTURE AND CONTENT OF THE PROGRAM**

The required elements are the curriculum, including the schedule of the training process and the summary of the time budget.

In accordance with "The Regulations on the organization of the education process in the NEFU with the use of the credit system" Quality management system - Organizational and legal documents-4.2.3-09-11 (SMK-OPD-4.2.3-09-11) Version 1.0 provides the organization of the individual learning trajectory. Within this program, individual learning trajectory is realized by the 30% introduction of all disciplines, which are chosen by the student himself (according to the FSES (FGOS)).

The distribution of subjects among semesters and years of study specified in the curriculum is fully consistent with the logical sequence of subjects study.

There are compulsory disciplines of the variable part in the curriculum. They solve to some extent the problem of removing the gap among the graduates of other training courses for more effective inclusion of the latter in the learning process.

Special disciplines within the variable part of the curriculum in the field of mathematical modeling and disciplines of computer science, parallel computation, computation using math

libraries (FEniCS, Python, HyPre) are provided in the plan structure for achievement of the program aims.

Programs of general professional and special subjects are developed in accordance with modern achievements of science, engineering, technology in this field.

Modern methods are used in parallel programming, modern mathematical libraries, for example FEniCS – 2011, help to implement mathematical models.

Programs of special disciplines are practice-oriented and are the basis for final qualifying works.

These programs are implemented mainly in the field of mathematical modeling of the Northern Territories problems, which are of a current importance for our country, such as the optimization of oil production, freezing and thawing of the soil, the condensation of natural gas, increase of oil recovery in permafrost conditions, etc.

The program 010400.68 Applied Mathematics and Computer Science provides several types of practices focused on the ensurance of the educational program aim: teaching practice, production, research and development practice.

Program content on all types of practices provides tasks that help to consolidate theoretical knowledge and skills and obtain its practical application. The contents of all types of practices and research work are interrelated and cause execution of the practical part of the graduate qualification work in accordance with the chosen theme of the study.

Final state certification of graduates consists of two parts:

- 1) passing the state exam;
- 2) presentation of the graduate qualification work.

Assessing the graduate qualification work a supervisor and a reviewer pay attention at the formedness of certain professional skills, including the ability to conduct researches and obtain new scientific and applied results and develop a conceptual and theoretical models of solvable scientific issues and tasks, which is an index of the ability to orientate oneself in the scientific literature and conduct scientific researches.

### **CRITERION 3. EDUCATIONAL AND METHODOLOGICAL MATERIALS**

During implementation of the general education program in the course of 010400 Applied Mathematics and Computer Science students use textbooks, schoolbooks with the stamp of the Ministry of Education and Science of the Russian Federation (MON RF) and the Educational and Methodological Association (UMO) in the course or literature recommended by these organizations. In the NEFU students have also an access to the Electronic-library system.

Each Educational and methodological complex contains the control questions and tasks for the current and intermediate performance control, contains test questions and tasks for the current and intermediate control, theoretical material form as the Power Point presentations, a list of basic and additional literature on the discipline and a list of Internet resources.

There are topics of classes and sets of tasks for self-study in the Educational and methodological complex (UMK).

The Educational and methodological complex (UMK) undergoes a substantial expertise by the Department which graduates students, the educational-methodical commission of the faculty committee and the Educational and Methodological Committee of the NEFU.

The set of educational materials used in the program constitutes a single structural and logical content of the program.

Access for students to the library and internet resources of the NEFU is free. There are computer labs for each speciality, connected to the Internet, in which students can get acquainted with native scientific and foreign journals by speciality.

Access to Internet resources is provided in all academic buildings through desktops and through a network of the wireless Internet Wi-Fi. The NEFU provides for all students the basic literature on all subjects of the curriculum through the network of delivery halls. Access to native and foreign periodicals is also provided in the Foreign Literature hall of the NEFU Library.

There are guidelines and recommendations on general subjects at the Department which graduates students.

Guidelines and recommendations on course and degree projection, practices developed out by the Department which graduates students in accordance with the requirements of the Educational and Methodological Association (UMO) on classical university education, the YaSU Regulations on the term papers, the Regulations on the final qualifying papers (24.12.2009)

University materials undergo an annual update process according to development of science, culture, economics, engineering, technology and social sphere.

#### **CRITERION 4.**

#### **CRITERION 5. HIGHER-EDUCATION TEACHING PERSONNEL**

Teachers competence and qualifications of which meet the requirements of the Federal State Educational Standards in the training course can implement the Master's education program.

93% of teachers has Degree level, including 3 Doctors of Science and 10 Candidates of Science, 1 Corresponding Member of the Russian Academy of Science (RAN). Teachers with Academic ranks: 3 Professors, 67 Assistant professors.

The duty regulations are developed and approved in accordance with the Charter of the NEFU and the qualification handbook for executives, specialists and other employees.

Teachers are actively involved in the organization of scientific events at the international, All-Russian and republic level. They have the opportunity to study at the postgraduate and doctoral courses, take PC courses and internships at the NEFU and other leading universities and research institutes.

The teaching staff has practical experience in the subject area. The teachers are the authors of the educational methods.

The University has created a program for the development of a teaching staff reserve. Periodically the attestation of teaching staff is carried out. The teaching staff of the Department, which graduates students, passed the attestation and assessment of competency are enrolled in the lists of NEFU teaching staff reserve. Every reservist has own mentor, that provides trainings for him by passing his own experience according to a personal development plan of the reservist.

The professor-mentor works at the department. He provides technical and scientific maintenance to young teachers.

## **CRITERION 6. RESEARCH ACTIVITY AND REALIZATION OF ITS RESULTS IN EDUCATIONAL PROCESS**

Teachers and employees of EI participating in realisation of the program, conduct researches in the field of the program at the expense of external and internal financing in which students and post-graduate students participate.

1. GO MES of the Russian Federation 4402 "Fundamental theoretical bases of mathematical models of ecological processes in conditions of the Far North". Executors of the project Troeva M. S., Chemezov K.A. – student.

2. "GO MES of the Russian Federation 5542 "Working out of application software for numerical modelling of extraction of hydrocarbonic raw materials using the high-efficiency computing systems" project head Vasilev V.I.; executors: Vabishchevich P.N., Popov V.V., post-graduate students: Borisov V.S., Zaharov P.E., Kolesov A.E., student: Fedorov A.A.

3. FTP Staff, 1.2.2 Project "Methods of Riemannian geometry and mathematical physics in researches of the nonlinear and nonclassical differential equations", project head Egorov D.V.

4. RFBR-region. №12-01-98514 Working out of mathematical models and high-efficiency software for supercomputer modelling of rational environmental management taking into account anthropogenous and technogenic influence on environment. Project head Popov V.V.; executors: Vasilev V.I., post-graduate students: Borisov V.S., Grigorev A.V., Zaharov P.E., Kolesov A.E.

5. RFBR "My first grant" 12-01-31020 Geometrical properties of the nonlinear differential and discrete equations ". Project head Egorov D.V.

6. RFBR "My first grant" 12-02-31650 Numerical calculation of radiation and sound scattering by the flat isolated vortex on the basis of the CABARE method ". Project head Jakovlev P.G., executor Antonov M.U.

7. RFBR "My first grant" 12-04-31934 Research of passive diffusion of small molecules through lipid bilayers of complex structure. Project head Antonov M.U., executors: Jakovlev P.G., post-graduate students: Ereemeev I.S.

Results are published in scientific articles of high rating magazines of SCADT and in the foreign scientific magazines-members of a database of scientific citing, such as Scopus, Web of Science, RLJI. Scientific results are reported in the international and All-Russian scientific conferences.

Within the limits of the development program of NEFU in 2011 there was organised a temporary labour collective (TLC) "Omega" for carrying out of research work "Designing and working out of a software package for solving the problems of modelling using high-efficiency systems".

Head of TLC: Lead programmer of CCT Vasileva M.V. Among the executors there are employees and post-graduate students of chair of AM: M.I. Alekseeva, N.M. Afanasieva, V.S. Borisov, A.O. Vasilev, A.V. Grigoriev, I.S. Yeremeyev, M.S. Yeremeyev, P.E. Zaharov, V.V. Popov, master's degree student - B.E. Innokentiev.

Main objective of works is working out of computing library for solving of problems of modelling using high-efficiency systems and program toolkit for remote start, monitoring and visualisation of the calculations, which basic purpose would be solving of actual high technology applied problems for Northeast federal university and scientifically-research institutes of Sakha Republic (Yakutia), demanding large-scale computational resources.

The development program of NEFU. The project “Working out of the application software for calculating-theoretical support of working out of deposits of firm minerals and hydrocarbonic raw materials” head, Dr. of physical and mathematical sciences, Vabishchevich P.N., the leading scientist. Executors: employees, post-graduate students and students.

Within the limits of the development program of NEFU in 2012 there was organised TLC "Gamma" for carrying out of research work under the project “Working out of the application software for settlement-theoretical support of working out of deposits of firm minerals and hydrocarbonic raw materials” under the direction of Dr. of physical and mathematical sciences Vabishchevich P.N. leading scientist. The purpose of works is working out and program realisation of the three-dimensional models based on the solving of multidimensional problems of heat transfer and filtrations, which give full consideration of climatic factors, geometry and a structure of modelled objects, creation of efficient, competitive at world level scientific personnel in FSAEI HPE “Northeast Federal University n.a. M.K. Ammosov” for solving of problems of applied mathematical modelling, actual for areas of Arctic regions and the Far North of the Russian Federation, on the basis of use of modern computing technologies. As a result of works of TLC "Omega" in 2011 there were designed and realised library SCORE for numerical modelling and program and its toolkits. «The software package for solving of problems of modelling using high-efficiency systems» is registered in the Fund of algorithms and programs of the Siberian branch of the Russian Academy of Sciences (Registration Certificate of program PR11057). Date of registration 11/11/2011.

According to the plan of works of TLC “Gamma” for 2012-2014 there were planned an edition of 3 monographies, 21 publications in reviewed editions, defense of 2 dissertations for PhD, working out of new courses for students, post-graduate students and employees, working out of 4 teaching aids, management of 12 final degree and master's theses. Delivered courses for students, post-graduate students and employees “Basis of parallel calculations” (Scientifically-educational centre “SKT - Dalny Vostok”, Center of computing technologies of Institute of mathematics and computer science of FSAEI HPE “Northeast Federal University n.a. M.K. Ammosov”, on October, 29th November, 2012).

For the execution of works there are involved 5 students, 8 post-graduate students of chair of AM, prepared 17 publications, in the cited editions there are 11 of them.

Within the limits of works of TLC «Gamma» there were prepared 2 teaching aids: “Computing technologies. Basic level”, “Computing technologies. Professional level”.

The results received within the limits of the project “Working out of simulators of ecologically safe technologies of working out and monitoring of mineral deposits of Arctic regions and North regions” (state contract № 02.740.11.0041) of FTP “Scientific and pedagogical staff of innovative Russia” for 2009-2013 have been used in scientific researches of students and post-graduate students, in 2012 there was 1 master's thesis defense.

#### Plenary reports:

International conference “Supercomputer technologies of mathematical modeling”, November, 28-30th 2011, Yakutsk:

- Dr. of physical and mathematical sciences, prof. Vasilev V.I., Can. of physical and mathematical sciences, Popov V.V. “Center of applied computing technologies of NEFU”
- Dr. of physical and mathematical sciences, prof. Vabishchevich P.N. “Methods of decomposition of area for non-stationary problems”.

Within the limits of agreement between NEFU and the Chinese agricultural university (Beijing, China) Popov V.V., Can. of physical and mathematical sciences, the senior lecturer of

chair of AM, Borisov V.S., the post-graduate student, senior teacher of chair of AM in 2012 visited Chinese agricultural university, Beijing.

They have worked on verification of mathematical models of frost penetration and thawing of soil processes.

In the Center of computing technologies of IMI for students there were organised and held regularly since October 2012 "Research seminar on the computing and applied mathematics", heads: Vabishchevich P.N., Vasilev V.I., secretary Antonov M.U.

In 2012 Egorova A.N., student MAG-11-2, has received the diploma of II degree for the report "Numerical modelling of replacement of mixing up liquids from cleaving-porous environments" at III All-Russian scientific conference of students, post-graduate students, young scientists and experts «Mathematical modelling of development of Northern territories of the Russian Federation», Yakutsk. Scient. head Timofeeva T.S., Can. of physical and mathematical sciences, the senior lecturer of chair of AM.

Graduates of magistrature annually enter postgraduate study of IMI NEFU on a speciality 05.13.18 - mathematical modelling, numerical methods and complexes of programs.

## **CRITERION 7. EDUCATION, MATERIAL AND TECHNICAL RESOURCES OF THE PROGRAM**

Types and volume of educational, financial and material resources used for the implementation of the program are defined by the internal regulations: SMK-OPD-4.2.3-011-11 (Quality management system - Organizational and legal documents - 4.2.3-011-11) "The regulations on the current and intermediate attestation of the NEFU students"; SMK-OPD-4.2.3.-018-11 (Quality management system - Organizational and legal documents-4.2.3.-018-11) "The regulations on providing scholarships and other forms of financial support for students, graduate students, doctoral students and other categories of students in the NEFU"; SMK-OPD-4.2.3-016-11 (Quality management system - Organizational and legal documents-4.2.3-016-11) "The regulations on the self-study of students"; SMK-OPD-4.2.3-015-11 (Quality management system - Organizational and legal documents-4.2.3-015-11) "The regulations on credit-modular organization of the educational process in the NEFU"; SMK-OPD-4.2.3-10 (Quality management system - Organizational and legal documents-4.2.3-10) "The regulations on the point-rating system in the NEFU"; SMK-OPD-4.2.3-09-11 (Quality management system - Organizational and legal documents-4.2.3-09-11) "The regulations about the organization of the educational process in the NEFU using the credit system"; SMK-OPD-4.2.3.-018-11 (Quality management system - Organizational and legal documents-4.2.3.-018-11) "The regulations on providing scholarship and other forms of financial support for students, graduate students, doctoral students and other categories of students in the NEFU"; "The Charter of the North-Eastern Federal University named after M.K. Ammosov".

The budget required for the implementation of the program is formed on the basis of the admission quotas.

Control of the budget implementation and effective use of the cash facilities are carried out during program implementation.

The processes of educational and financial resources formation and use allocated to the program implementation are clear. Reporting information is provided on the website of the University: the Report of financial and economic activities, the Development plan of financial and economic activities of the University (link to the NEFU website: <http://www.svf.u.ru/universitet/docs/>).

The financial resources of the program provide eight classrooms, equipped with interactive lecture rooms and 6 classrooms with projectors, 6 computer labs with modern

equipment, access to high-performance computing cluster "Arian Kuzmin" in the Center of Computational Technologies of the IMI NEFU. Teaching laboratories, in which classes are given, are provided with consumables to the degree which is sufficient for achievement of expected learning outcomes by students.

The scientific Library of the NEFU provides access to full-text electronic resources of the Russian and foreign databases (Digital Dissertation Library, ProQuest Dissertations & Theses; Springer Resources, [www.sciencedirect.com](http://www.sciencedirect.com)).

Thanks to the RFBR (RFFI) Grant there is an open access to the journals Wiley <http://onlinelibrary.wiley.com> (1543 Journals of the natural, human and social sciences), American Physical Society <http://publish.aps.org/> (12 Journals), American Mathematical Society <http://www.ams.org/mathscinet/index.html> (access to the abstract database in mathematics - MathSciNet) etc.).

The website of the NEFU library - <http://libr.s-vfu.ru>.

There are reading rooms, the NEFU libraries, the IMI NEFU computer classes, access to the internet - wi-fi for self-study of the students.

## **CRITERION 8. PROGRAM MANAGEMENT STRUCTURE**

There are normative documents (standards, regulations, instructions, staff schedule, duty regulations, etc.), which regulate the planning, organizing and managing of the programs implementation and development process at the NEFU-website <http://s-vfu.ru/universitet/rukovodstvo-i-struktura/strukturnye-podrazdeleniya/umu/docs.php> and also <http://s-vfu.ru/universitet/rukovodstvo-i-struktura/strukturnye-podrazdeleniya/upravlenie-kachestva/dokumenty/>.

The selection procedure of teachers, their qualification and skills is registered in the "Regulations on the attestation procedure of employees holding positions of the research and educational personnel in the NEFU".

The research work of teachers is encouraged according to the instructions " Criteria of the performance measurement of the NEFU higher-education teaching personnel on the results of a certain period of time."

Criteria names: releases in the international journals indexed in the databases of "Web of Science" or "Scopus"; articles published in the peer-reviewed journals included in the RSCI database; articles in the peer-reviewed journals included in the HAC RF (VAK RF) list; articles in the Russian scientific journals published outside the Republic of Sakha (Yakutia): Russian patent for the invention in the name of the NEFU, the author(s) of which is(are) employees of the University; the RF patent for an utility model in the name of the NEFU, author(s) of which is(are) employees of the university.

The management system of education quality at the program level includes monitoring of the actual results of education in the context of disciplines and programs in general, regular assessment of the educational program implementation in accordance with the curriculum, implementation of the standards and regulations established by the educational establishment during the educational process; extent of expected education outcomes made by students; the quality of teaching; the quality and availability of educational resources, students' opinion about the quality of education.

Primary control of implementation of the standards, rules and regulations approved by the educational establishment during the actual implementation of the educational program is carried out by the Department which graduates students. Then control is carried out at the level of the university directorate.

Information and communication technologies (ICTs) are used to transfer and store reports of employees, maintain the databases of students and teachers.

The Internet resources are used to maintain interactive communication between students and teachers: the department and the IMI e-mail, the NEFU website.

## **CRITERION 9. PARTICIPATION OF EMPLOYERS IN THE PROGRAM IMPLEMENTATION**

NEFU encourages participation of employers in the program implementation: in 2011, A.G.Tomskii, director of "SakhaInternet NT" was awarded the IMI NEFU diploma for participation in the implementation of the baccalaureate and magistracy programs.

The supervisors of organization practice based on state funding are paid in accordance with the Decree of the Ministry of Labour of Russia dated 21.01.1993 № 7, which is called "On approval of hourly labour payment rates for employees involved in learning session conducting at enterprises, institutions and organizations that are on state funding".

Subject and education programs undergo in general the process of adjustment with employers according to the order established in the NEFU. In particular, there are agreement forms of the general education program in the course 010400.68 - "Applied Mathematics and Computer Science", the Master's program "Mathematical modeling" with: the State Department of Pension Fund of the Russian Federation in the Republic of Sakha (Yakutia), the National Library of the Republic of Sakha (Yakutia); the Limited Liability Company "SakhaInternet New Technologies"; JSB "Almazergienbank" JSC.

Practice programs along with the other GEP documents undergo the procedure of adjustment with employers. The main adjustment in the program proceeds at this level.

Representatives of employers participate in implementation of the program and development of the term papers and final qualifying works themes. For example, B.I.Andreev, a student of the MAG-11-2 group, wrote the term paper and currently he is writing a master's thesis on "The numerical modeling of heat transfer during a sleeve welding in polymer armored pipes" under the auspices of Dr of Science N.P. Starostin who is the head of laboratory of environmental testing of the Institute of Oil and Gas Problems of the Siberian Branch of the RAS (IPNG SO RAN).

Students are provided with all necessary resources for practice, according to the agreements signed with employers.

In a typical traineeship agreement of the NEFU students an enterprise undertakes the obligations: to provide students with a place for traineeship, create conditions, in which a students can receive knowledge in the specialty; to conduct mandatory instructions; to provide students with overalls, safe shoes and other personal protective equipment in accordance with the enforceable standards for the relevant employees for the time of traineeship; if necessary, to provide students with hostels on the terms granted to employees.

## **CRITERION 10. THE PARTICIPATION OF STUDENTS IN THE EDUCATIONAL PROGRAM CONTENT AND ORGANIZATION PURSUANT TO THE PROGRAM**

Feedback from students is carried out by conducting questionnaires, surveys. Also curatorial hours, Institute meetings on various subjects, conferences are held. Students can use also Mass Media: the university website, the newspaper "Our University", groups in social networks. According to the survey - 17% is aware of use of feedback, 6% believes that there is no feedback and the rest is at loss to answer.

Each study group has a monitor and an educational sector. The responsibilities of monitors are a direct interaction with the department, which graduates students, visits of weekly meetings with other monitors and organization of students activities at study and extracurricular time. The educational sector sees to university attendance of students, monitors the group academic activity at the university and institute.

The NEFU Student Council and the IMI Trade Union Organization of Students (POS IMI) function at the university.

According to the NEFU Charter every student has the right to participate in forming the content of the educational program subject to requirements implementation of the Federal State Educational Standard of the Higher Professional Education. Encouragement of students for active participation in life of the department and the faculty is based on: "The regulations of the appointment order of higher state academic scholarships to the NEFU students SMK-OPD-4.2.3-024-12 (Quality management system - Organizational and legal documents-4.2.3-024-12)". The regulations on providing scholarship and other forms of financial support for graduate students, doctoral students and other categories of the NEFU students SMK-OPD-4.2.3-016-11 (Quality management system - Organizational and legal documents-4.2.3-016-11).

At the department level surveys are conducted, Educational and methodical complex of subjects is periodically reviewed, new books appear at the department. Students have access to various educational, scientific resources and libraries through the NEFU library.

According to the survey 75% of students believe that the quality of educational resources used during the program implementation is sufficient to achieve the intended results.

According to the regulations of self-study of the NEFU students, the Department defines the requirements and conditions of self-study tasks and evaluation criteria taking into consideration the opinion of students and authorities. Students' opinion is considered by conducting a questionnaire. 92% of students believe that the conditions created for self-study are favorable.

The university uses the documentary system that allows to maintain accounting and control the consideration of students' appeals through the Dean-office. The process is regulated by the Charter of the University, the concept of quality assurance. The documentary system has not been created at the program level yet. The Dean-office takes complaints of students as applications.

## **CRITERION 11. STUDENT SERVICES AT THE PROGRAM LEVEL**

At the moment there is no Personal Student Study.

Students studying at the University on the commercial basis can pay for education by installments and you can take out an education loan (at the Sberbank).

There are 3 types of material assistance, which is allocated by the Social Student Protection Fund on the basis of The provisions of the Social Student Protection Fund for the NEFU students: one-time material assistance, the amount of which does not exceed the amount of the state social scholarship; one-time material assistance, the amount of which exceeds the state social scholarship; monthly financial material assistance.

The primary Trade Union Organization of Students (PPOS) organizes the issuance of hotel voucher to the sanatorium-resort therapy "Smena", which is occupied annually by 1200 students who need treatment. The Trade Union Organization of Students pays 10% of the tour price. The Trade Union Organization of Students also organizes summer vacation of orphan students and students left without parental care. Annually 70-85 students go to other cities of Russia.

Payment of social scholarships one-time per year payment for winter clothing, stationery, etc. are provided.

A full price of hotel vouchers to the sanatorium-resort therapy "Smena" is paid. Summer rest of orphan students in the central cities of the Russian Federation for health resort treatment is organized one time per year.

Students, whose per capita family income is below a living wage, are paid a monthly material assistance. In case of the Fund insufficiency, a monthly material assistance is provided to students with the lowest per capita family income.

University optional courses in foreign languages according to the foreign language level are given in the NEFU.

For example, English (preparation for TOEFL, IELTS tests), Communicative English (Pre-Intermediate level), Spoken Chinese, etc.

There is catering network with 1065 seats: buffets, cafeterias, the food plant "Sergeleeh".

There are 4 sports halls with a total area 2880.6 square meters, an athletics arena, the swimming pool "Dolgun", a hall fight, the stadiums "Triumph" and "Iunost".

Therapeutic treatment of students is carried out by the polyclinic № 5, the sanatorium-resort therapy "Smena", a dental clinic, a health-recreation center, a special correctional office of physical therapy and massage, a medical center.

From the 1<sup>st</sup> of April 2000, the Centre of psychological assistance for students functions in the NEFU. Students can pass psychological diagnosis, visit individual counselings, talks and discussion group on the topics: Didactic adaptation (to the conditions of studying at university) Self-organization of the student; Stress coping before exams, etc; socio-psychological trainings are conducted.

The work to promote the employment of students and graduates is conducted at the NEFU Career Center of the Student Development Management. The center implements its activities in accordance with applicable laws and other normative and legal acts of the Russian Federation, the NEFU Charter, the local regulations of the University and the Center. The key objectives faced by the Center are to increase employment opportunities for students and graduates.

The NEFU has its own electronic database of summaries and vacancies. In order to share information about job vacancies and summaries the Career Center cooperates actively with the ministries, enterprises and public services for labor and employment of population and employers.

One of the priorities of the NEFU Career Center is organization of temporary employment of students during educational term.

According to the results of a questionnaire survey conducted at the end of 2012 a large part of students successfully combines study with work.

The NEFU Career Center together with the Psychological Services Center "Razvitie", organizers, group tutors provide trainings, tutorial on composition of a summary, a portfolio, an employment contract, etc. (January, February). Students can attend discussions, seminars, for example, on "Career - guidance ", "Work search technology".

## **CRITERION 12. QUALITY ESTIMATION OF TRAININGS FOR UNIVERSITY ENTRANTS**

According to the list and forms of the Master's entrance examinations all entrants are interviewed, while an average merit is also considered.

Career guidance classes with students of a senior year and individual work with students who have active research position are conducted.

Work on career guidance and trainings for potential entrants in the regions of Russia and the CIS countries is conducted by the Department for training and placing of employees affiliated with the Ministry of professional education, training and placing of employees of the the Sakha Republic (Yakutia) (MPOPiRK RS(Ya)).

## COMPETENCIES

Generic name of a competent sphere	Cognitive competence: to know, to understand	Functional competence: to be able, to know, to have a skill, practical experience
<b>1. General cultural competence:</b>		
<b>1.1. Interprofessional:</b>	1. Ability to understand the philosophical concepts of natural science, to master the basics of the methodology of scientific knowledge in the study of the different levels of organization of matter, space and time (OK-1);	1. Ability to use deepened theoretical and practical knowledge in the field of applied mathematics and computer science (OK-3);
	2. Ability to have an idea about the current situation and problems of applied mathematics and computer science, history and methodology of their development (OK-2);	2. Ability to acquire new knowledge and skills, also in unknown fields of knowledge that are not directly related to the scope of activity, through information technology independently, to use them in practice, to broaden and deepen their scientific view of the world (OK-4);
		3. Ability to generate new ideas and demonstrate the skills of independent research and work in the scientific team (OK-5);
<b>1.2. Personal:</b>		1. Ability to improve and develop their intellectual and cultural level, to seek moral and physical development of their personality (OK-6);
<b>1.3. Social:</b>		1. Ability and willingness to communicate actively in scientific, industrial, social and public spheres of activity (GK-7);
		2. Ability to use freely Russian and foreign languages as a means of business communication, ability to active social mobility (UK-8);

		<p>3. Ability to use deepen knowledge of the legal and ethical standards in assessing the impact of their professional activity, developing and realizing social projects (OK-9);</p> <p>4. To have high language competitiveness in a professional activity in multilingual conditions taking into account regional specific features (UK-5);</p>
<b>2.1. Research and scientific, research and survey activities:</b>		<p>1. Ability to conduct researches and to obtain new scientific and applied results (PK-1);</p> <p>2. Ability to develop conceptual and theoretical models of solvable scientific problems and objectives (PK-2);</p>
<b>2.2. Project, industrial and technological activities:</b>	Ability to analyse problems in depth, to set and ground on objectives of scientific, project and technological activities (PK-3);	1. Ability to develop and optimize business plans of the scientific and applied projects (PK-4);
<b>2.3. Organizational and management, production and technological activities:</b>		<p>1. Ability to manage projects (sub-projects), to plan research activities, to analyze risks and manage a project team (PK-5);</p> <p>2. Ability to organize the processes of corporate training on the basis of technologies of electronic and mobile learning and development of corporate knowledge bases (PK-6);</p>
<b>2.4. Educational work:</b>		1. Ability to conduct seminars and tutorials with students, as well as lectures of special courses (PK-8);
<b>2.5. Normative-methodological activities:</b>		<p>1. Ability to develop corporate standards and profiles of functional standardization, systems and information infrastructure (PK-7);</p> <p>2. The ability to develop educational-</p>

		methodical complexes for electronic and mobile learning (PK-9);
<b>2.8. Socially-oriented activities:</b>		1. Ability to realize corporate policy in the improvement field of business social responsibility to the society, to participate in its development (PK-13);
		2. Ability to implement decisions oriented to support social projects, to improve the e-literacy of the population, to provide accessibility of information services (PK-14);
<b>2.6. Consulting activities:</b>		1. Ability to develop analytical reviews of the field of applied mathematics and information technology (PK-10);
<b>2.7. Consortium activities:</b>		1. Ability to work in international projects (PC-11);
		2. Ability to participate in activities of professional online communities in specific areas (PK-12).

## CVs of EXPERTS

**Expert's name: Vitaly Ya. Vershinin**

Work place, position	Inter-Russian State Social University, Director of the Academic Pedagogical Institute of Continuing Professional Education, Associate Professor of Mathematics and Computer Science 
Academic degree, academic title	Ph.D., Associate Professor
Deserved titles, degree	n/a
Education	Higher
Professional achievements	41 printed editions
Area of expertise	Pedagogy
Practical experience in the direction of the program, subject to examination	2 years

**Expert's name: Mercedes Siles Molina**

Work place, position	International expert, Professor of Algebra, Geometry and Topology at the University of Malaga, Malaga, Spain. 
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