

Agency for Public Quality Assurance of Education and Career Development AKKORK

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по контролю  
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и развитию карьеры  
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## REPORT

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

**020201.65 "Fundamental and Applied Chemistry"**

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

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## LIST OF ACRONYMS

AC	Academic Council
AFM investigation	atomic force microscope investigation
ALB	Academic and laboratory building
BFNS	Buildings of the Faculties of Natural Sciences
BNAS	National Academy of Sciences of Belarus
DHMCOC	Department of High-Molecular Compounds and Organic Chemistry
ERC	Education and Research Center
FBG	Faculty of Biology and Geography
FSAEI	Federal State Autonomous Educational Institution
FSES	Federal State Educational Standard
FTP	Federal Targeted Program
GPD	General Professional Disciplines
HMC	High-Molecular Compounds
HPE	Higher Professional Education
IBPC	Institute for Biological Problems of Cryolithic Zone
MAB	Main Academic Building
MEP	Main Educational Program
MPRI	V.A. Belyi Metal Polymer Research Institute
MSU	Moscow State University
NEFU	North-Eastern Federal University
OGI	Oil and Gas Institute
QMS	Quality Management System
RFFI	Russian Fund of Federal Property
RS (Y)	the Republic of Sakha (Yakutia)
SAC	State Attestation Commission
SB of RAS	Siberian Branch of the Russian Academy of Sciences
SEC	State Examination Commission
SEM	scanning electron microscopy
SRW	scientific research work
STC	Scientific and Technical Council
TEM	transmission electronic microscopy
TMA	Teaching and Methodic Administration
TMC	Teaching and Methodological Council
US	University Standard
XRF	X-ray fluorescence spectroscopy
YSU	Yakutsk State University

**Program background:** Main Educational Program (MEP) of the specialization *020201 Fundamental and Applied Chemistry* has been implemented since 2011-2012 academic year in compliance with the Federal State Standard for the track(specialization) *020201 Fundamental and Applied Chemistry* of higher professional education (specialist program) as approved by the Ministry of Education and Science of the Russian Federation order No. 2061 dated December 24, 2010, and was registered in the Ministry of Justice of the Russian Federation dated February 10, 2011, reference number – 19793; The program is implemented by three departments: the Department of High-Molecular Compounds and Organic Chemistry, the Department of General, Analytic and Physical Chemistry, the Department of Biochemistry and Biotechnology. The place of implementation: the FBG, BFNS, 48 Kulakovskogo Str., Yakutsk. Mode of study – full-time.

## EDUCATION QUALITY ASSURANCE

### CRITERION 1. THE PROGRAM EDUCATIONAL OBJECTIVES

The objective of specialist training in the specialization *020201 Fundamental and Applied Chemistry* in NEFU named after M.K. Ammosov is to prepare efficient specialists in fundamental and applied chemistry for the needs of economy of the North-Eastern part of the Russian Federation, to meet the needs of research and development institutes, establishments of the tertiary, secondary, professional secondary education systems, laboratories of state and private scientific centers and factories, conducting researches in chemistry and related fields (mainly, in materials science, biochemistry, geochemistry, petroleum chemistry, ecology, pharmacy), to provide sustainable social and economic development of the North-Eastern part of the Russian Federation and the Sakha Republic (Yakutia), that have common cultural and professional competence in compliance with the requirements of FSES for HPE in this track.

In addition to professional knowledge and skills a graduate in the specialization *020201 Fundamental and Applied Chemistry* must have certain personal qualities, including high level of thinking, abilities to generalize, analyze and process information, social and cultural tolerance, respectful and careful attitude towards historical heritage and cultural traditions, readiness to work in team and healthy lifestyle. The formation of these qualities is carried out while learning disciplines, mentioned in the liberal and social and economic disciplines frame, disciplines of mathematical and natural cycles, undertaking practical training and conducting scientific research work and exercising.

The educational objectives conform to the NEFU Mission (a link to the NEFU website [http://old.yfu.ru/content/news/news\\_detail.php?ID=6480](http://old.yfu.ru/content/news/news_detail.php?ID=6480)). The program objectives were spelled out according to the labor market demands. The Sakha Republic (Yakutia) experiences a rapid growth of mining and oil and gas industries, the creation of enterprises, specializing in development and introduction of new building composition materials into construction clusters in the Republic (Basalt Fiber Manufacturing Plant, OOO Tehnologii bazal'tovyh materialov (Basalt materials techniques), OOO Adgezija), the improving of nature protection agencies and Environmental Services activities, the increasing number of chemical analysis instruments at medical and industrial enterprises, that needs the training of highly efficient specialists with advanced knowledge in chemistry, taking into account the labor market demands (a link to the NEFU website <http://www.s-vfu.ru/kolonka-rektora/detail.php?ID=6502>).

Students, professors and fellows, participating in its implementation, are informed about the stated program objectives, because the MEP annotation is available on the NEFU website <http://s-vfu.ru>. The 1<sup>st</sup> year students familiarize themselves with the program objectives during curatorial hours. The survey shows that the program objectives completely meet educational needs of the students.

## CRITERION 2. STRUCTURE AND CONTENT OF THE PROGRAM

The program has the approved curriculum, including the front page, the graph and plan of the teaching process as well as summarized data on time budget as an Appendix to the curriculum. The distribution of disciplines by terms and years of training, specified in the curriculum, completely complies with logical order while learning the disciplines. The curriculum structure of the program learning is uniform for all students and includes a sufficient number of optional disciplines. A student individually determines his course according to the initial attainment level upon the recommendation of his department which graduates students, which organizes the learning according to the fundamental educational program.

The curriculum includes additional hours in the advanced learning of a foreign language, optional courses in chemistry disciplines. The program content meets students' expectations. The optional part of the curriculum has disciplines which, according to students opinion, will be demanded while looking for a job.

The educational program was drawn up in cooperation with major employers, taking into account their requirements (protocol on the Agreement with employers). At the suggestion of Oil and Gas Institute, the Siberian Branch of the Russian Academy of Sciences, where up to 30% of graduates in chemistry are employed, laboratory practicals in *Arctic Materials Science, Chemistry and Frost-Resistant Elastomeric Materials Technology, Design and Production of Items Made of Composition Materials* are conducted in research laboratories of the Institute.

The programs of all disciplines, internships, included into the curriculum, are approved by the Teaching and Methodical Council of NEFU. Methodological recommendations on term and diploma papers were drawn up by the University. The Final State Attestation Regulation (including graduation theses) was drawn up by the department and approved at the meeting of the Academic Council of the FBG dated 22.02.2013 in compliance with the Final State Attestation Regulation of NEFU (*Final State Attestation Regulation of NEFU graduates, completed their training in main educational programs of HPE, QMS-GPD-4.2.3-96-12 1.0 version*, approved by order No.42-ОД dated January 23, 2013). During the developing of programs of disciplines, internships, term and qualifying papers, the assumed results of teaching as part of courses and the program as a whole are taken into account. Each work program includes the specified competences, which will be created.

Programs of general and special professional disciplines include modern achievements in science, machinery, technology of the Russian Federation. The special disciplines programs are practice and competence-oriented. The special disciplines as *Synthesis and Processing of Polymer Materials, Physical and Chemical Principles of Polymer Nanocomposites Creation, and Disperse-Filled Polymers* are introduced in the field of development of new polymer materials with improved properties.

The following disciplines were introduced into *Hydrocarbon Energy Carriers* track: *Chemistry and Crude Hydrocarbon Technology*.

*Analysis of Surrounding Environment Objects, Techniques of Sampling and Sample Preparation* etc. were introduced into *Harmonious Exploitation* track.

Laboratory researches are conducted with scientific and research equipment. For example, in *Nanomaterials* and *Nanotechnologies in Materials Science*, researches on nanocomposites structural study are conducted using infrared spectroscopy, AFM investigation, X-ray diffractometry.

Tasks for internships aim at reinforcement of theoretical knowledge in special disciplines and obtaining manufacturing and analytical equipment skills, the formation of individual experimental research and interpretation of the obtained data, thus, it aims at the formation of

professional competence (PC) (QMS-GPD-4.2.3.-85-12 Regulation on Internships Organization of NEFU students, approved as of 25.05.2012).

Tasks for pre-graduation internship are set according to themes of graduates' qualifying papers. According to the NEFU order, second-year students must be divided into two specializations: *Analytical Chemistry* and *Chemical Materials Science*, they are to conduct SRW in the NEFU laboratories and academic institutions, undertake chemical-engineering internship, pre-qualification internship and write a qualifying paper. The final stage is a graduation thesis.

Final State Attestation of graduates includes two stages:

- 1) taking a state exam in chemical disciplines;
- 2) the defense of graduation thesis.

Exam papers include questions on the modern development of science according to the program. For example, exam papers No.18 and 19 have questions on properties and the application of plastics, and the answer requires knowledge in modern science, machinery and production.

- Thermoplasts (polyethylene, polypropylene, polystyrene, polytetrafluoroethylene) properties and application;
- Thermoset material by the example of phenol formaldehyde resin. Properties and application.

The graduation thesis is the final stage of state attestation exams and its objective is to systematize, generalize and reinforce theoretical knowledge, skills, to estimate the formed common cultural and professional competence of a graduate in compliance with the FSES requirements.

Themes of the presented papers are based on the needs and problems of enterprises in the Sakha (Yakutia) Republic. Their distinctive feature is that they are region-oriented and include an in-depth examination of the studied chemical industry theory. Among the theses, defended in 2012, we should mention the following: *Evaluation of oil gathered from the ESPO oil pipeline (Eastern Siberia - Pacific Ocean oil pipeline)* by Stepanova A.N. (supervisor: Candidate of Geological and Mineralogical Sciences (*Kandidat geologo-mineralogicheskikh nauk*), Associate Professor (*Docent*) Zakharova S.S.), *Analysis of Water-Soluble Polymers with Oil Displacement Agent Potential at Oilfields in the South-West Yakutia* by Shilova Ju.E (supervisor: Candidate of Engineering Science, laboratory chief of OGI of the SB of RAS Shitz E.Ju.) etc.

### **CRITERION 3. TEACHING MATERIALS**

Book supply for main educational program in 020201 *Fundamental and Applied Chemistry* complies with FSES (each student has at least 0.5 books and learning materials).

Teaching materials consist of theoretical, practical, diagnostic and methodological parts (Teaching materials structure was developed by the NEFU Teaching and Methodological Council). The structure and content are characterized by logical and consequent treatment.

The teaching materials were developed for all disciplines, included to the MEP curriculum 020201.65 *Fundamental and Applied Chemistry* and are approved by the NEFU TMC (see Appendix B6).

Lectures are Power Point presentations, there are hand-outs and sometimes it is possible to use full-size exhibits.

The full list of set and optional books, as well as electronic educational resources and websites, which students may use for written works (individual works, term papers, reports) is specified in article 5 *The teaching and Methodological Provision of the disciplines* of work programs of the teaching materials.

The practical part of the teaching materials includes tasks for the student individual work for a term and the course schedule includes deadlines.

Roughly 50% of the discipline workload account for student individual work. Thus, students have the possibility to combine individual and classroom training.

Test materials for current, interim and final control, including those developed by NEFU by itself, permit to assess the level of the assumed training results.

The NEFU libraries and websites are freely available for students. There are internet-connected computer classrooms by specializations, where students can familiarize themselves with domestic and foreign journals of their specialization. All buildings have Internet access via desktop computers, a system of the NEFU library circulation divisions and Wi-Fi. The university provides all the students with the set-book in all disciplines of the specialization curriculum by circulation divisions of scholar like libraries. Domestic and foreign periodicals are available at the foreign literature reading room of the NEFU research library. The list of periodicals includes 44 names of journals (a summary table is at the department). Electronic library systems provide access to 34 electronic domestic and foreign resources and to others – by subscription publications (contract scans are at the department).

The MEP annotation, a full list of the curriculum disciplines and all disciplines annotations are available on the NEFU website. All teaching materials are uploaded onto the moodle system: [www.moodle.y-su.ru](http://www.moodle.y-su.ru)

All students accepted for classes have the access to laboratory sessions, practical training and data bases, which provide for the courses of study.

The department which graduates students is responsible for coordination and interaction between different divisions and department, implementing MEP. The approval of discipline work programs, teaching materials, test materials is carried out at the meeting of the department, taking into account those objectives and tasks which are resolved by the discipline to implement the common MEP tasks and objectives. Every year the Teaching and Methodical Committee of the Department carries out an independent examination of the retained knowledge in all disciplines of all tracks. The examination results are sent to students' departments. The relevant department analyses the results of the retained knowledge examination. The discipline work program and the teaching materials are updated annually by professors.

Other Russian higher education establishments (Pacific National University, Komsomolsk-on-Amur State Technical University) use teaching materials and monographies of professors, as well as developed within the framework of the teaching materials program: A.V. Vinogradov, A.A. Okhlopkova, P.N. Petrova, M.I. Sleptsova *Disperse-filled polymers* – Yakutsk, YST(Yakutsk State University), 2008. – 194 p., Okhlopkova A.A., Vinogradov A.V., Pinchuk L.S.

*Plastics filled with ultradisperse inorganic compounds.* – Gomel: MPRI of BNAS, 1999. – 164p.

#### **CRITERION 4. TECHNOLOGIES AND METHODS OF EDUCATIONAL ACTIVITIES**

The assumed results of specialist teaching in a higher education establishment can be achieved by the logical order of disciplines, clear objectives and tasks of each of them, specified in the specialization standard and work programs, the use of integrated training technology.

Major types of classes: lectures, laboratory sessions, practical training and seminars for full-time students are conducted in the form of FTF, using training informational technologies. To maintain the pace of individual learning, the majors have electronic teaching materials in the moodle system. NEFU developed the laboratory session requirements. (The laboratory sessions requirements QMS-US-4.2.1-001-11 *Laboratory Sessions and Practical Training. General Requirements for Organization and Conducting, 1.0 version*. Approved by the university head dated 04.06.2011).

University standards: QMS-GPD-Regulation on interim and final attestation of NEFU students, Regulation on scoring and rating assessment system of the NEFU academic performance, State Examinations Regulation, Methodological recommendations for the students-chemists graduation thesis permit to assess real knowledge and skills level. Introduction of e-learning at program level is a part of the university strategy to increase quality and availability of learning. The majors of the federal component, disciplines of regional and university components, optional disciplines have their electronic teaching materials in the moodle system and provide for individual pace of learning, information availability, open requirements for knowledge and skills and, therefore, this encourage the quality improvement of certain disciplines and the specialization as a whole.

On-the-spot training on situational cases is conducted in *Design and Production of Products Made of Composition Materials*. For example, a student gets a task to select design for a product made of polymeric and elastomeric composites, taking into account actual operating conditions, to create a mould for the production of the product of the selected design. The university system [moodle.y-su.ru](http://moodle.y-su.ru) includes electronic teaching materials in all majors, which permits to create an individual way of learning.

ERC *Nanotechnology*, Institutes of the SB of RAS use the technologies of individual ways of learning in their educational research (ERSW) and scientific research student activities (SRSW).

#### **CRITERION 5. TEACHING STAFF**

Professors, whose competence and proficiency comply with the program objectives and are sufficient for teaching, have taken part in the implementation of the educational program. The percentage of teaching staff with academic degrees is 78%, including 13.33 % of Doctors of Science (*Doktor Nauk*) and 64.64 % of Candidates of Sciences (*Kandidat nauk*). The percentage of teaching staff with degrees: 4.7% of Professors, 39.5 % of Associate Professors (*Docent*) (see Appendix 12).

The requirements for professors competence and proficiency are specified in the Unified Skills Guide No. 858 for Positions of Managers, Specialists and Employees (dated October 30, 2009). There is a Work Instruction on the Professional Competence and Performance Assessment of the teaching staff (Work Instruction on the Professional Competence and Performance Assessment of the Teaching Staff, approved by the university head order No. 317-01, dated 06.04.2012).

The NEFU Charter (Order No. 2038 dated June 21, 2011. Information on the NEFU website:

<http://s-vfu.ru/upload/iblock/f12/f1232fa3f06ddf693a7ad54188c532c5.pdf>; collective labor agreement. Information on the NEFU website: <http://s-vfu.ru/universitet/docs/>); the university



rules and regulations; Regulation on the FBG, Regulation on the Department of High-Molecular Compounds and Organic Chemistry of the NEFU FBG; the university head and the FBG dean order; Regulation on Research and Practice Attestation; orders, instructions and other normative and instructive acts of the university administration; professor's position description.

Professors who implement the program of specialization *020201 Fundamental and Applied Chemistry* have been constantly improved their proficiency. They have conducted scientific and innovational activities, have scientific and methodological publications (in both Higher Attestation Commission (VAK) leading journals and foreign scientific journals), participate in different scientific events, which may take place both abroad and in Russia, play an active role in the management and running of international, Russia-wide and republican scientific events.

The Head of the Department which graduates students (DHMCOC), Professor A.A. Okhlopkova and the department staff methodically integrate educational, scientific and innovational activities. The relations with the Teaching and Methodical Branch of the Department on the basis of Oil and Gas Institute of the SB of RAS have been enhanced (YSU order No.105-ОД dated 08.12.95, TMA Decree No. 10/2 dated 30.06.93, AC YSU Decree No. 4/7 dated 29.03.95). In 2012 the professors and employees, who implement the program, participated in 26 international conferences, published 14 articles in scientific journals with the Russian list of journals indexed, 2 articles in foreign journals (Web of science), received 6 Russian patents, participated in international exhibitions with own projects.

Assessing the professor discipline proficiency the following aspects are taken into account: the compliance of actual teaching results with the assumed, the methodical competence level, practical experience in the area.

Professors create their own discipline teaching methods, have practical experience, and are invited to different educational establishments to lecture and the graduation thesis management. For example, in 2011-12 on the invitation of Yugra State University, Surgut State University (Khanty–Mansi Autonomous Okrug, also known as Yugra) Professor A.A. Okhlopkova lectured on polymer nanophase materials science for students in the specialization *020101 Chemistry*, post-graduate students, professors and fellows. The Department which graduates students and general-course departments, which implement the program, provide the creation of succession pool, necessary to implement the program in further 5 years. Mentors of young succession pool candidate for the teaching staff are appointed (Succession Pool Regulation). The dean's office and the Department which graduates students monitor the best graduates who are invited to work at university. It was drawn up: Regulation on Interns Researchers, Associate Professors Researchers, Professors Researchers, and Professors Mentors which provides for lesser study load, scientific activities take significant amount of time. Furthermore, for it to be enhanced in NEFU, there is a possibility to create an own laboratory under the NEFU Development Program. Young professors and scientists can get university head fellowships, internship programs in the leading Russian and foreign scientific centers, programs of the teaching staff encouragement for their performance. Young professors can get methodical and scientific support. Young professors conduct open lectures, which are then discussed at the department to provide methodical assistance. When the teaching staff is to be sent to international conferences, young professors are preferred. For example, an internship of a senior department professor Afanaseva E.S. from the Faculty of Chemistry of MSU named after M.V. Lomonosov (Lomonosov Moscow State University) resulted in the joint scientific research activity *Analysis of Nanomaterial Samples by the TEM, SEM, and XRF Methods*.

## **CRITERION 6. SCIENTIFIC RESEARCH ACTIVITIES AND THE IMPLEMENTATION OF THEIR RESULTS IN TEACHING PROCESS**

Professors and fellows of the Department which graduates students (the Department of HMC and Organic Chemistry of NEFU) conduct scientific research activities by external financing:

1. National priority project *Education*, project *Innovative training program of graduates in the field of new materials, developed for the economy needs of the North-Eastern Russia*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

2. FTP *Development of Infrastructure for Nanoindustry in the Russian Federation in 2008-2011*. Project 2.3. *Education and Research Center in Nanotechnology*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

3. RAS Presidium grant 8. Project *The Development of Methods for Obtaining New Chemicals and Materials* (coordinator, Corresponding Fellow A.K. Solntsev). Project *The Development of Physical and Chemical Principles of Multicomponent Polymer Nanocomposites Production Based on Thermoplastics* (in cooperation with OGI of the SB of RAS). Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.; Okhlopkova, the funding of 120,000 RUB;

4. RFFI grant Project 06-08-00931-a *The Examination of Polymer Nanocomposites Outwearing and Traction Principles* Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

5. RFFI grant Project 09-03-98504-p\_ восток\_a *The Development of Self-Organizing Polymer Nanocomposites Based on Mineral Raw Materials*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

6. Government order of the RS (Y) for 2008-2010. Project *The Development of Polymer and Elastomeric Nanocomposites for Sealing Elements and Friction Units of Equipment in the North*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

7. Government order of the RS (Y) for 2008-2010. Project *The Development of Nanocomposite Material Based on Engineering Thermoplastics to Increase the Reliability and the Life of Motor Vehicles*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

8. FTP 02.741.11.2125 Scientific and teaching staff of the innovative Russia for 2008-2013. The Provision of organizational and technical support to conduct the international conference for youth, including scientific school principles. The Provision of organizational and technical support to conduct the international conference for youth, including scientific school principles. *The Production of New Materials for Operation Under Extreme Conditions*. Supervisor: D.Eng.Sc., Professor Okhlopkova A.A.;

9. FTP *Scientific and Teaching Staff of the Innovative Russia for 2009-2013*. Project *The development of a Genetic Marker System, Determining High Risk for Development of Lung Cancer*. Supervisor: M.Sc.Pharm, Associate Professors (*Docent*) Chirikova N.K.

10. The RS (Y) President grant *The Development of Bearing Material with Adaptive Properties to Operating Conditions Based on Polytetrafluorethylene and Carbon Fillers*, Struchkova T.S.

11. Grant of Foundation for Assistance to Small Innovative Enterprises in Science and Technology in the Russian Federation (Bortnik Fund). START program 276p/5161 *The Development of New Elastomeric Composite Materials Based on Polypropylene Oxide, Acrylonitrile-Butadiene and Other Types of Rubber*. Petrova N.N., 2006

12. Grant of Foundation for Assistance to Small Innovative Enterprises in Science and Technology in the Russian Federation (Bortnik Fund). START program *The Development of Polymer Composite Products for Tribotechnical Purposes under Extreme Operating Conditions*, Sleptzova S.A., 2005-2006

13. The RS (Y) President grant *The Examination of the Bitumoid Hydrocarbon Composition of the Cambrian Kerogenic Formation*. Alekseev A.G., 2007
14. Grant of V.P. Larionov: *The Development of New Triboengineering Products Based on Polytetrafluorethylene*. Struchkova T.S., 2007
15. Alekseev A.G. *The Government Grant of the Russian Federation President for Scientific Foreign Internships in Young scientists, post-graduates*, 2007
16. Chirikova N.K. President grant, the RS (Y) *The development of a Genetic Marker System, Determining High Risk for Development of Lung Cancer*, 2008
17. Fellowship of the Russian Federation President for young scientists in the priority areas – Afanaseva E.S., 2012
18. Grant of the Sakha Republic (Yakutia) President for maintaining innovative projects in the priority scientific, scientific and technological, innovate activities – Okhlopkova Zh.M. Chirikova N.K. Rjazanskij V.D., Kuzmina A.A., Malogulova I.Sh., Abramova Ja.A.

The results of researches, conducted by professors, have been introduced into the practice of scientific research institutes and organizations, involving students, who obtain practical experience. As an example: *Monography* by Okhlopkova A.A., Sleptzov S.A., Petrova P.N. *Problems of Safe Motor Vehicles // In the book The Safety of the RS (Y): Social, Ecological and Anthropogenic Problems* edited by V.Ju. Fridovskiy, V.A. Prokhorov – Novosibirsk: Nauka, 2008. – 296 p.

Scientific research activities of professors and students are a compulsory part of the MEP structure and are implemented in Art.5 *Practices and Scientific Research Activities. The integration with academic scientific research institutes, which have the required human resources and scientific and technological potential and the major activities predetermines objects and types of graduates professional activities in this area.*

The participation of students in the externally-funded projects is rather common. This predetermines the scientific discipline formation when working at the project.

1. Mojakunova I.A., XO-08 group, performer of the project *Immunological and Microbiological Disorders in Patients with Socially Important Infections in Yakutia and Their Possible Recovery With the Help of Endemic-Based Medicines* under FTP *Scientific and Teaching Staff of the Innovative Russia for 2009-2013*. Event 1.2.2. – natural sciences.

2. Grant of the SR (Yakutia) President, 2007 *The Research of Possible Use of Water-Soluble Polymers to Increase the Effectiveness of Oil Production at Oilfields in the South-West Yakutia* by Mihajlova O.N., XO-02 group

3. Grant of the *north2north* student mobility program within the University of the Arctic in 2006, Shadrinov N.V., XO-02 group

4. Grant of the SR (Yakutia) President, 2010 *The Development of Nanocomposites Based on Polytetrafluorethylene and Alumag*. Bochkareva T.A., XO-05 group

5. Grant of the SR (Yakutia) President, 2010 *The Use of Zeolites in Water Purification Systems*. Matveeva N.V., XO-05 group

6. Grant of the SR (Yakutia) President, 2010 *The Mechanisms of Asphalt, Resin, and Paraffin Deposition Development from Oils*. Mihajlova E.A., XO-05 group

7. Grant of the SR (Yakutia) President, 2008 *The Methods of Removal of Asphalt, Resin, and Paraffin Deposition from Oils*. Rykunov A.A., XO-03 group

8. Grant of the SR (Yakutia) President, 2011 *The Development of Self-Lubricating Tribotechnical Materials for the Northern Operating Conditions*. Alekseev A.A., XO-06 group

The scientific research activities results, obtained by both professors of our faculty and professors of other faculties, have been implemented in the teaching process. For example, in the following disciplines as: *Arctic Materials Science; Analysis of Surrounding Environment Objects; Nanomaterials and Nanotechnologies in Materials Science; Physical and Chemical, Biotechnological Principles of Biological Feedstock Processing* etc.

Professors participate in scientific conferences both in Russia and abroad as guest (plenary) speakers. For example, Professor Okhlopkova A.A. participated in several conferences in 2012: International scientific and technical conference *Miners Forum 2012* Donetsk, Ukraine; Russian-wide young scientists conference *Problems and Perspectives of Energy Complex and Complex Engineering Systems Management in the Arctic region: works*, Yakutsk, 2012; 15<sup>th</sup> European conference on composite materials (ECCM 15 composites at Venice), Venice, Italy, 2012.

The scientific activities results, obtained by students in term papers and graduation theses have been implemented by enterprises and organizations. For example, the following works: The statement of the following students involvement Borisova R.V. (XO-08 group), Rassokhina I.V. (XO-08), Lazareva N.N. (XO-08), Okhlopkova S.S. (XO-08), Kornilova E.A. (XO-08), Gavrilova A.A. (XO-08), Vasilev A.P. (XO-09), Panova E.V. (XO-09), Makarov S.T. (XO-09), Khaldeeva A.R. (XO-09) into the scientific project *Chemistry and Nanomaterials and Raw Hydrocarbons Technology* conducted in technology research and training laboratory *Polymer Nanocomposites Technology* of ERC *Nanotechnologies* at the Arctic Innovation centre for students works. Students' scientific circle *Polymer Nanocomposites and Nanotechnologies* functions on the basis of the Department which graduates students (the Department of High-Molecular Compounds and Organic Chemistry) (Circle establishment order No. 18 dated December 14, 2007). The track *Structural Materials Science and Functional Nanomaterials* which has been implemented at the department, was granted the status of the NEFU scientific school in 2012. The circle and scientific school supervisor – Okhlopkova A.A., D.Eng.Sc., the Head of the DHMCOC of the FBG.

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

Types and amounts of educational, financial, material and technical resources, raised for the program implementation, are determined by university regulations.

There are the following documents: QMS-GPD-4.2.3.-018-11 *Regulation on Fellowship and Other Types of Financial Support for Students, Post-Graduates, Postdoctoral Students and Other Categories of Students at NEFU* etc. The budget, necessary for the program implementation, is drawn up annually. The processes of raising and the use of financial and educational resources, necessary for the program implementation, are transparent. Statement information is available on the university website: Annual Profit And Loss Statement, The Development plan for the university financing and operating activities (the NEFU website link: <http://www.s-vfu.ru/universitet/docs/>).

Advanced training of professors and fellows, the buying of chemical agents, supplies are financed annually. Financial and material and technical resources of the program permit to buy, maintain and operate material and technical resources and equipment, necessary for the program implementation. The Department bought equipment for 79 mln. RUB in 2007-2012. The program's information provision quality (handbooks, training aids, methodological materials, scientific and reference materials, data bases etc.) is satisfactory. The NEFU library annually monitors the increase in handbooks, scientific literature and periodicals.

The set-book fund of the track *Fundamental and Applied Chemistry* consists of 959 items. The access to electronic domestic and foreign resources consists of 39. The quality of computer and information infrastructure is sufficient for students' and professors' academic and scientific activities. A computer classroom of the Chemical Department of the Faculty, the Department which graduates students has video projectors, notebooks and a netbook for the teaching process.

For the purpose of the program implementation of the specialization *020201 Fundamental and Applied Chemistry* and conducting of applied researches, a modern scientific infrastructure was established in NEFU. It includes chemical laboratories, equipped with the required learning and research equipment to conduct laboratory sessions, as it is specified in the curriculum, and to write term papers, graduation theses, research papers, to form professional competence.

ERC *Nanotechnology*, which consists of three technology research and training laboratory, equipped with modern equipment, was established under the FTP *The Development of Infrastructure for Nanoindustry in the Russian Federation*:

- *Polymer Nanocomposites Technologies*
- *Mechanochemical Biotechnologies*
- *Graphene Technologies*

Students undertake internships in training, research and training laboratories of the Department of Chemistry, ERC *Nanotechnology*, *Chemical Technologies and the Biochemistry of the Cryolithic Zone Living Organisms* of NEFU, and under the contracts: No.1 with OGI of the SB of RAS, No.2 with IBPC of the SB of RAS in laboratories, equipped with the equipment and instruments, necessary for professional competence formation in compliance with the assumed training results.

The program resource provision permits to provide students with possibilities for independent academic and scientific research activities.

As of January 1 the scientific library has 1,164,848 items, including 361,924 scientific books, 678,045 handbooks, 86,444 periodicals.

The scientific library (ALB), (58, Belinsky Str.) – scientific reading rooms for different specializations; the BFNS (42, Kulakovsky Str., MAB) includes 82,716 scientific books.

For the purpose of the program and courses implementation using e-learning, teaching staff and students have permanent technical support (on-line, by phone, ICQ and e-mail).

The University has the approved development and improvement plan for the program's educational and material and technical resources to maintain and improve the education quality.

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

The University has regulations on planning, organization and management of the program implementation and development, including Faculty Regulation, Department Regulation, Regulation on MEP of HPE, approved schedule, position description for professors etc.

Major regulations are available on the NEFU website <http://s-vfu.ru/universitet/rukovodstvo-i-struktura/strukturnye-podrazdeleniya/umu/docs.php>, and on <http://s-vfu.ru/universitet/rukovodstvo-i-struktura/strukturnye-podrazdeleniya/upravlenie-kachestva/dokumenty/>

The program management is carried out by the head of the Department which graduates students. All decisions concerning the program management and implementation are made collectively at the meeting of the Department which graduates students. The Academic council, the Teaching and Methodological Committee, the Council for Science and Engineering of the

Faculty participate in the program management and implementation. All major documents relating to the program implementation and the improvement of education quality guarantees are discussed in these elected bodies. The decisions are recorded.

The distribution of functions among departments and other faculty units and NEFU is balanced and aimed at achieving the program objectives.

The Teaching Department of the Teaching and Methodical Administration as part of its job functions controls the organization of teaching process in NEFU. It carries out the following planned actions:

- an inspection of the lecture rooms fund preparedness for academic year (once a year)
- a check of the timetable compliance with the curriculum (twice a year)
- a check of the classes compliance with the approved timetable (monthly)
- timetabling and the distribution of university-wide lecture halls (twice a year)
- laboratory fund data collection
- a check of the exams timetable compliance with the curriculum and examination regulations
- an inspection of the examination organization compliance with the timetable and the availability of examination documentation
- an inspection of the State Examination passing and defense procedures

The classes inspection is carried out monthly, excluding the examination period. Fellows of the Teaching and Methodical Administration, the Quality Management and the Administration for Student Development participate in inspections. Inspections show that dean's offices and institutes' offices of the head of studies do not have full information about missed classes and reasons of professors' absence. The Teaching Department of the Teaching and Methodical Administration annually draws up the timetable for 7 lecture halls: 118<sup>th</sup> and 120<sup>th</sup> lecture halls of the Academic and laboratory building (ALB), 402<sup>nd</sup> and 424<sup>th</sup> of the Main Academic Building (MAB), 228<sup>th</sup>, 263<sup>rd</sup> and 461<sup>st</sup> of the BFNS, with the total number of seats for 720 persons. In the 2011-2012 academic year these lecture halls are 99% loaded from 8 A.M. till 3.30 P.M., and 70% loaded from 3.50 P.M.

Besides the teaching process, different conferences, live link-ups, seminars, advanced trainings, various meetings, schools, the defense of term and project papers, of graduation and diploma theses etc. were conducted in lecture halls by request of academic and structural units of NEFU.

The Teaching Planning Unit of the Teaching Department of the TMA annually collects information about laboratories and creates their data bases.

The planned check and updating of the passport data was carried out in June, 2012 as well as additional information about operating laboratories of the NEFU teaching units was added to the data bases.

The examination timetable check was carried out one month before the beginning of the examination period. In general, the teaching units made the following mistakes:

- the skipping of disciplines
- names of disciplines do not comply with those, specified in the curriculum
- interim control does not comply with the curriculum

All faculties and institutes were informed about all the inspections and checks results, all observations and mistakes were corrected.

The TMA annually checks all programs curricula for new enrollment as well as curricula for undergraduates.

The Methodical Department collected the discipline work programs and teaching materials records, implemented university educational programs, as part of the preparation for the planned inspection of the educational programs methodical provision in September, 2012. The records will be supplemented immediately after the discipline work programs and teaching materials inspection by the TMC experts from January 31, 2013.

The planned inspection of the methodical provision of educational programs was conducted at the NEFU Departments which graduates students on October 22-31, 2012.

The aim of the inspection is to provide information and methodical support for the Departments which graduates students as part of the NEFU preparation for self-examination and accreditation in 2014.

Tasks of the inspection:

1. To analyze the provision of educational programs with discipline work programs and teaching materials
2. To assess the teaching and methodical provision of educational programs and the compliance with the disposal standard requirements at departments which graduate students
3. To establish the TMA data base on the teaching and methodical provision of educational programs in the compliance with FSES
4. To make recommendations on teaching and methodical support of educational programs for departments which graduate students, heads of teaching units in the compliance with FSES

The object of the inspection: the teaching and methodical provision of the MEP, including:

- the main educational program;
- graduate's competence model;
- competency matrix;
- the passport and program of competence formation;
- curriculum;
- discipline work programs;
- teaching materials;
- internship programs;
- Final State Attestation programs;
- Assessment Means Funds.

Data base: the discipline work programs and teaching materials records presented by departments which graduate students, teaching and methodical documentation of the MEP.

Program initiator: The Teaching and Methodical Council of NEFU.

Program sponsor: The Methodical Department of TMA.

Basis for the inspection: Work plan of the Methodical Department of the TMA, order No. 714-УЧ dated 22.10.12.

Results of the planned inspection are the following: report with review of each educational program, the summarized rating of all educational programs on the basis of their methodical provision. The report was electronically submitted to deputy deans, directors for educational work of all teaching units and pro-rector-supervisors to make management decisions.

It is encouraged. There are *Requirements for Teaching Staff Performance for a Period of Time*, the best unit of NEFU is annually awarded and gets bonus.

The NEFU Teaching and Methodical Council in 2012 conducted a contest *The best classes, using active and interactive forms of teaching* for the purposes of creativity improvement and the professional competence actualization of professors in the field of modern educational technologies. According to the Contest Guidelines, it has three stages:

1<sup>st</sup> stage: from 19 to 29 March – on-site elimination round at teaching unit level.

2<sup>nd</sup> stage: from 2 to 10 April – the taking up of contest documents

3<sup>rd</sup> stage: from 11 to 17 April –the examination board work

The Contest Committee considered 31 applications.

The works were classified by the types of classes: a lecture, a practical training, lecture+practice.

According to the results of the TMC contest *The best classes, using active and interactive forms of teaching*, the Contest Committee decided that 3 nominees had taken the **1<sup>st</sup> place** with the bonus of 10,000 RUB, 3 nominees had taken the **2<sup>nd</sup> place** with the bonus of 8,333 RUB.

3 nominees had taken the **3<sup>rd</sup> place** with the bonus of 6,667 RUB, including Sheina Natalja Evgenevna (FBG) *A practical training, using interactive technologies of game control*.

All participants were awarded with certificates, and the winners with diplomas.

According to the results of a joint contest with Institute of Advanced Technologies in Education (Head Savvinov V.M.), a source book *The best experience of the NEFU professors, using educational technologies* as part of the *Biblioteka UMU* series (The Teaching and Methodical Administration Library) has been prepared for publishing.

There is an annual contest for nominations of the NEFU STC, Contest Guidelines are available on the website: [http://s-vfu.ru/universitet/nauka/scientific-technical-council-of-the/polojenie\\_konkutsy\\_nts/](http://s-vfu.ru/universitet/nauka/scientific-technical-council-of-the/polojenie_konkutsy_nts/).

There is Regulation on the NEFU Professors and Fellows Encouragement which regulates Sections of scientific research activities, according to which each teaching staff annual rating is calculated. The NEFU education quality management system has the necessary material and technical resources, including procedure which guarantees that students shall be taught by competent and proficient professors. The professors' proficiency has certain requirements as the percentage of teaching staff with degrees, publications in the leading journals, advance trainings, participation in foreign, Russian and regional programs etc. There are Sections, concerning the involvement of student in the quality assurance and education guarantees procedures. For example, surveys of students. A form has 32 questions, concerning the university teaching quality and the quality of future specialists training.

The teaching quality has been annually monitored. Open lessons are very effective tools to assess the teaching quality. Disciplines, areas, dates of open lessons are planned by departments, negotiated at the teaching and methodical committee meetings, and are submitted to the Teaching and Methodical Administration at the beginning of the term. After the discussion of open lessons they draw up records and conclusions with the assessment of the professor's academic proficiency from the scientific and methodical point of view, of techniques and methods, used at classes, the assessment of the achievement level of the open lesson task.

The reports of the department which graduates students (the Department of HMC and Organic Chemistry of the FBG) are prepared every year, reports of the heads of the SEC and SAC are delivered at the Department Academic Council meeting, the merits of the program are then



determined as well as the necessity to refine certain points, which must be eliminated within the set period.

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

NEFU has The Education Quality Assurance Concept, approved by the Academic Council, reference number – 5 dated 18.01.2013. One of its activities is *The strengthening of relations with employers, the ensuring of open and transparent university activity to the public*, which includes the participation of employers in the organization and carrying out the educational process; the participation of employers in the formation and assessment of graduates' professional competence; cooperation with employers in employment and job security of graduates.

Employers participate in the development and actualization of the disciplines program content and the educational program as a whole. For example, Sokolova M.D., Petrova P.N., Ivanova I.K., fellows of OGI of the SB of RAS, the major employer for the most talented, developed the discipline work program and teaching materials for the following disciplines: *Arctic Materials Science, Nanomaterials and Nanotechnologies in Materials Science, Chemistry and the Crude Hydrocarbons Technology, Synthesis and the Processing Technology of Polymer Materials, Disperse-Filled Polymers*. Fellows from OGI of the SB of RAS and IBPC of the SB of RAS in cooperation with professors of the Department which graduates students have been developing internship programs. They have participated in the educational process (carry out master classes, seminars), have conducted joint department meetings, where the issues concerning the programs content and the formation of graduates' professional competence are raised and discussed.

The involved employers provide material resources for free: chemical agents, supplies, necessary for scientific research activities. Furthermore, students can use the library holdings and unique equipment of the Institutes.

## **CRITERION 10. PARTICIPATION OF STUDENTS IN THE DETERMINATION OF THE PROGRAM CONTENT AND THE TEACHING PROCESS**

The feedback with students is carried out by curators, group monitors and directly by polls, surveys, conversations, curator hours, meeting on the introduction of scoring and rating systems, individual student work etc. According to the survey, 86% of the questioned know about the feedback.

According to art. 3.1.14 and 3.2.3. of the Agreement on Cooperation between the Administration and Full-Time Students of Federal State Autonomous Educational Institution of Higher Professional Education *North-Eastern Federal University named after M.K. Ammosov* for 2012-2015: Student governing bodies – Students' union participate in the development of proposal on the improvement of organization of the teaching process, academic performance and a discipline.

The activities, held at NEFU: the 1<sup>st</sup> year student conference, the graduate conference, polls and surveys. 60% of the students approved these activities. For example, the University held *Self-Government Day* in October, 2012.

According to *Regulation on Fellowship and Other Types of Financial Support for Students, Post-Graduates, Postdoctoral Students and Other Categories of Students at NEFU* QMS-GPD-4.2.3-016-11, group monitors, learning units get enhanced fellowships, activists of the learning process are awarded with certificates from the Department and University. 45% of the questioned said, that their activities had been encouraged. 39% were undecided.

The University uses the documented system, which permits to record and control the consideration of students' appeals through the dean's office. This process is regulated by the University Charter, the Quality Assurance Concept.

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

In the Internet at <http://www.s-vfu.ru/> site students are given an open access to electronic scientific library of NEFU and web chair where students can watch and listen to interesting assembly lectures of best scientists of NEFU and other Russian high schools.

At biological-geographical faculty as of 11.02.2013 there are 37 students are trained on a commercial basis. These students have a possibility to pay training by credit, and also to use for training the educational credit received on favourable terms in partner-bank (Sberbank). Children of employees of NEFU who worked at university more than 15 years under the university Collective agreement are given the possibility to pay training at the expense of means of NEFU. As of 10.02.2013r at BGF at the expense of means of NEFU 2 students are trained (Safonova V.A., BH-11, Ushnitsky I.M., PP-11). On the basis of Charter of NEFU and Statute about current and intermediate certification of students of NEFU (see site of NEFU, sections "Documents" and "Administrative divisions"), the students who have shown good results in results in examinations, activity of scientific and public life of faculty and university have possibility to change paid training for budgetary. While transferring at a planned place by the commission on transfers and restoration of NEFU there is also considered a social and financial position of the student. As of 10.02.2013 in BGF 7 students are transferred from paid to a budgetary position. At excellent study, achievements in science, sports and art creativity in addition to the basic federal grant there are appointed nominal grants as support of talented student's youth organised by various funds and organisations. For example, grant of A.E.Kulakovskiy - 3, grant of A.E.Mordinov - 1, grant of G.R.Basharin - 1, grant of V.A.Protodjakonov - 1, grant of P.H.Starovatov-2, grant of S.P.Sidorova-2, grant of P.A.Petrov-2, grant of I.N.Barahov-2, grant of A.I.Kuzmin, the grant of F.G.Safronov-1, State grant of SR (Y) - 7.

Since 2011 NEFU for the best students arranges free Christmas vacation in the central cities of Russia (Moscow, St.-Petersburg). By the results of 2012 150 students have received the monetary award "Christmas vacation in Moscow and St.-Petersburg" for successful study, in scientific, sports, public and creative activity. The program of Christmas vacation includes the extensive cultural program including acquaintance with Moscow and St.-Petersburg. The main event of vacation is visiting by students of NEFU together with the pro-rector on interaction with federal structures Alexey Tomtosov of a special economic zone of "Skolkovo".

The students of NEFU with personal statements and in case of available means of FSIO and corresponding documents are paid travel privilege for aviation and motor transport. For 2012 20 students of BGF got the travel privilege. In NEFU there is a system of organisation of a subsidized meals for students from socially-vulnerable segments, there is also a half paid voucher for a vacation center "Smena".

Today in NEFU there is great attention paid for productive leisure, physical development and for improvement of social conditions of students. All these actions are financed from means of NEFU. So, for the purpose of development of physical training and sports, propagation of a healthy way of life the federal university has got 180 units of training equipment. In yards' territory of Studying-laboratory and Main educational buildings, at stadium "Yunost" and in yards of hostels № 7-2, 7-1, 18, 20, 66-a, 66-b there are established sports training equipment.

In a hostel 17 (2) in 2012 a capital repairs has been done, round the building there are power saving sensors are installed, they are able to react to movement and automatically switched off, when the students leave their room. Besides, with a view of safety, on each floor in corridors

and halls observation cameras are built in. On the territory of student campus there is a wireless Internet - wi-fi.

At university there are created all necessary conditions for students-invalids (hearing aids, ramps. Students with the limited abilities have flexible individual schedule of visiting of lecture lessons, competitions, and seminars).

Students are able to study additional programs and pass their training abroad. Annually the most scientifically-active part of students passes training courses in other countries, participating in the exchange program "Sever-severu" of University of Arctic regions. Training are held in Sweden, Norway, Finland, Iceland, etc. Northeast federal university has contracts (agreements): with faculty of sciences about Environment of the Earth of University of Hokkaido (Japan) for development of the academic and educational exchanges and cooperation between two universities; with University Lini (China), Pusansky university (Korea) for development of exchange programs and for working out of joint programs on the organisation of students practices. The sphere of its activity includes Magadan area, Chukotka that expands possibilities of passing practices.

Students have access to 27 courses to increase the level of foreign language (English, French, German, Turkish and Chinese languages). Courses are conducted by teachers of chair of foreign languages. Students are suggested courses for beginners of natural specialities and areas, communicative English and the practical English grammar, English language in sphere of professional communications, business English for 3-5 courses, etc.

The health services are organised in polyclinic № 5, polyclinic of NEFU (66 building) and in sanatorium "Smena". The sanatorium is located in the centre of student campus on the basis of a student's hostel to the address: Yakutsk, 17, Kalandarashvili St., hostel 6, blocks A and B. Near there are available pool, sports complex, computer centre, cultural centre "Sergeljahskye ognj", shops, drugstore, mail, etc.

Meals are arranged both in the buffet tables and in refectories of educational buildings and at food production facility № 5. The food production facility "Sergeleeh" includes the whole complex of public catering facilities - refectories of "Sergeleeh", institute of technology; cafe "Sergeleeh", at hostels № 6 block V № 7\1 № 8\1; buffets MTB, of medical and road institute, and also there are confectionery, meat-fish, vegetable, flour departments. Students of BGF have meals in a refectories and buffets of CFNS.

At biological-geographical faculty there are 3 computer classes intended for preparation of students to lessons with use of network resources of NEFU and informational Internet resources.

Since April, 1st, 2000 in NEFU there are Center of the Psychological help to students, where individual consultations are given, and psychological diagnostics is carried out, talks and seminars are delivered on different topics: Didactic adaptation (to training conditions in high school); Self-organising of the student; Stress removal before examinations, etc.; socially-psychological trainings are carried out.

At university there is a purposeful activity on support of small business, starting of new workplaces and help to students-businessmen. Within the limits of these actions annually in high school there are Days of student's business, seminars-trainings for the students, planning to open their business, competition of business projects among students-businessmen. At the initiative of the Center of career and students-businessmen of high school there were founded a public organisation "Council of students-businessmen of Sakha Republic (Yakutia)" which founders are 17 students-heads of the enterprises. The university together with Council opens a student's business incubator.

## CRITERION 12. ASSESSMENT OF APPLICANTS ATTAINMENT QUALITY

Reception rules in NEFU establish the lower limits of results of Unified State Examination for the entrants entering budgetary places. In 2012 the lower limits in biology - 42 points, in Russian language and social science - 40 points that is above the lower limits established by Federal Education and Science Supervision Agency in biology, Russian-36, social science – 39.

According to the reception rules in NEFU the winners and prize-winners of the final stage of the All-Russian Competition of schoolchildren (subject), winners of workshop conference «Step to the future» enter without examinations. Winners, prize-winners of the List of the Competition of schoolchildren (confirmed by the order of ME of the Russian Federation of 7.11.2011 №2598) are given privileges - a victory in biology, chemistry and to social science is estimated in 100 points.

Winners, prize-winners of NECS, graduates of faculty of pre-university education, specialization classes (a natural-science, physical and mathematical specialization), base schools with which there are long-term contracts, have advantage at equality of points.

In 2012 the lowest passing score of the enlisted entrants on budgetary places is -169; Unified State Examination grade point average in sum of results of Unified State Examination in 3 subjects - 58,2.

Professionally oriented work at faculty and chair will be organised on the basis of the plan of professionally oriented work, confirmed by rector of NEFU and Concepts of vocational counselling of NEFU for 2011-2019 (№ 238-ODES of 3/23/2011).

Chairs participate in all-university and faculty professionally oriented events:

**Offsite "Days of university"** - in 2011-2012 there were 20 offsite meetings with the general coverage of 2788 pupils of schools. In frameworks of professionally oriented offsite meetings with representatives of administrations, education departments, schools, with the public, parents, entrants, graduates, there are held courses on preparation for Unified State Examination and seminars for teachers, consultations of psychologists, there are signed contracts on cooperation.

**"Doors Open Days at BGF"** - spent 2012.28.03, all chairs took an active hand: dean Nikolaev A.N., Mihajlova N.V., Andreeva M.P, responsible for professional orientation work at chair (Lazareva P.V., Gogolev P.V., Sleptsova N.P.). Annually take part more than 60 pupils and parents.


**"Week of FPUEPO NEFU"** - spent in October, 2012 for pupils from 5-11 classes of educational institutions of Yakutsk. In various events of a week have taken part more than 8 000 of schoolchildren from 35 schools, about 300 parents, 150 teachers of schools and 250 teachers of university, and other events.

At faculty it is constantly conducted advertising - informational work: issued booklets about faculty, areas of preparation with the general circulation more than 1 000 copies. In the university newspaper "Our university" there appeared heading "Compass of the Entrant". According to the schedule there were published information about reception campaign of faculty, preparation areas, and also materials on preparation for Unified State Examination in biology, chemistry; articles: "How to be prepared for Unified State Examination in chemistry (Andreeva M. P., Nahova N.A.," How to be prepared for Unified State Examination in biology" (Jakovleva A.V., Sofronov R.P.).

HETP of chair annually conducts consultations, lessons for potential entrants. First of all for pupils of contractual base schools, internally-correspondence school works within an academic year, teachers and students work in summer scientific camps, supervise research work of schoolchildren.

## CVs of EXPERTS

**Expert's name: Aleksander G. Mazhuga**

Work place, position	Researcher of the Department of Organic Chemistry, Faculty of Chemistry at Moscow State University named after M.V. Lomonosov, Associate Dean for Innovation 
Academic degree, academic title	Ph.D. in Chemistry, Associate Professor
Deserved titles, degree	
Education	
Professional achievements	Jury member of the International Olympiad "Tuymaada" in Chemistry.
Area of expertise	
Practical experience in the direction of the program, subject to examination	

**Expert's name: Evangelia Varela**

Work place, position	International expert, Professor, Vice-president of the Committee of the University of Bologna process, President of the European Association of Chemists, Thessaloniki, Greece. 
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