



REPORT

ON EXTERNAL REVIEW

of the study programmes in the fields of study:

«Chemistry» (04.03.01, 04.04.01),
«Fundamental and applied chemistry» (04.05.01),

delivered by National Research Tomsk State
University

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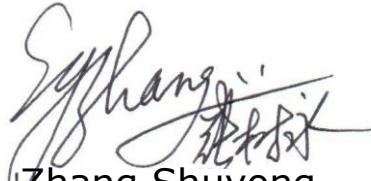
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The Chair of the Review Panel



Zhang Shuyong

Tomsk, 2019

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INTRODUCTION

External review of the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) delivered by National Research Tomsk State University (hereinafter - TSU) was conducted on October 23-25, 2019 and included the analysis of self-evaluation report (41 pages and 30 annexes), site visit and preparation of the present report. The University on the whole, Faculty of Chemistry (Y. Slizhov, dean), and the departments have well prepared documents for accreditation of the study programme.

Meetings with students, teachers, the Dean's Office, and the University administration were held. The Review Panel listened to the comments and proposals of students on the improvement of training quality.

The main goal of the external review is to determine the correspondence of the reviewed study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) delivered by National Research Tomsk State University to standards and criteria of public accreditation, which are developed by the National Centre for Public Accreditation (hereinafter - NCPA) together with the Higher Education Evaluation Centre of the Ministry of Education of the People's Republic of China (hereinafter - HEEC) in compliance with the European Standards of Quality Assurance in Education ESG-ENQA.

The Final Report is the basis for decision of the National Accreditation Board and HEEC Accreditation Board on public accreditation of the study programmes in compliance with standards and criteria of NCPA and HEEC.

1. CONTEXT AND MAIN STAGES OF THE REVIEW

1.1 Terms of Reference

According to item 1, 3 article 96 of the Federal Law of the Russian Federation of December 29, 2012 No.273-FZ "On education in the Russian Federation" organizations, which implement educational activities, may apply for public accreditation in various national, foreign and international institutions. Employers, employer associations and designated organizations have the right to conduct public accreditation of professional educational programmes, which are delivered by an educational institution.

In order to conduct international public accreditation of the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) TSU applied to NCPA, which operates on the national level and is recognized by leading international organizations of quality assurance in higher education.

1.2 Composition of the Review Panel

The international experts were nominated by the Higher Education Evaluation Centre of the Ministry of Education and the Slovenian Quality Assurance Agency upon NCPA's request.

The Russian expert was nominated by the Guild of Experts in Higher Education.

The employer representative was nominated by the Russian Chemists Union.

The representative of the students' community was suggested by the Siberian State Medical University.

The composition of the External Review Panel was approved by NCPA.

The Review Panel included six international and national experts:

- **Zhang Shuyong** - Ph.D., Professor, Associate Dean of Undergraduate School of Shangdong University, Director of the Center for Teaching Advancement and Faculty Development, council member of the Shandong Chemical Society – foreign expert, Review Chair;
- **Nikolai Prokopov** - Doctor of Chemical Sciences, Professor, First Vice-Rector, MIREA - Russian Technological University – Russian expert, Deputy Review Chair;
- **Xu Shouhong** - Ph.D., Professor, Associate Dean of the School of Chemistry and Molecular Engineering, East China University of Science and Technology – foreign expert, panel member;
- **Ivan Leban** - Ph.D., Professor in the sphere of Inorganic, Structural Chemistry and Crystallography, Vice-Rector of the University of Ljubljana (2001-2005), Director of the Slovenian Quality Assurance Agency in Higher Education (2013-2018), member of an expert group of the European Association of Universities – foreign expert, panel member;
- **Maria Ivanova** - Vice-President of the Russian Chemists Union, deputy chair of the Council for Professional Qualifications in Chemical and Biochemical Complex – representative of professional community, panel member;
- **Andrey Tsupko** - 3rd year student of the Pharmaceutical Faculty, Siberian State Medical University – representative of students, panel member.

The focused expert knowledge of the Panel members, long-term experience of working in the system of higher education and profession, active position of students and employers became the basis for effective consideration of issues within the framework of evaluation.

The participation of the Russian representatives of the higher education system gave an opportunity to analyze the activity of the programmes under evaluation in the context of the world trends in quality assurance and within the scope of the national educational system.

1.3 Purposes and objectives of the review

The purpose of public accreditation is improving quality of education and forming quality culture in educational institutions, discovering best practices in continuous enhancing the educational quality and public information on educational institutions in accordance with the European educational quality standards.

The main goal of the peer review is to determine the correspondence of the reviewed study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) delivered by National Research Tomsk State University to standards and criteria of public accreditation, which are developed by NCPA together with HEEC in compliance

with the European Standards of Quality Assurance in Education ESG-ENQA; and to develop recommendations for the study programme with the purpose of improving the content and structure of the educational process.

1.4 Stages of the review

The review included three main stages:

1.4.1 Study of the self-evaluation report

National Research Tomsk State University was responsible for conducting the self-evaluation procedure, developing and timely submitting of the self-evaluation report to NCPA.

According to the "Guidelines on Self-evaluation of Educational Programmes", which were developed by NCPA, the self-evaluation report is written on 41 pages and includes: introduction, findings, conclusions, 30 annexes. The self-evaluation procedure was conducted on the basis of SWOT-analysis according to every standard of NCPA.

According to the review schedule, the self-evaluation report of the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and applied chemistry» (04.05.01) was submitted to NCPA and mailed to the members of the review panel 30 days before the site-visit.

While studying the self-evaluation report the panel members formed a preliminary opinion about the reviewed educational programmes on compliance with the standards of NCPA and HEEC and criteria on accreditation and with the European standards of education quality.

The members of the review panel assessed the quality of preparation of the self-evaluation report with regards to its text structuring, compliance of information with the report's sections; quality of perception; sufficiency of analytical data; availability of references to supporting documents; completeness of information.

The review panel members pointed out some weaknesses of the self-evaluation report:

1. It is not clear how the Development Programme of the Faculty correlates with the Development Programme of TSU; the role of the TSU's quality management system (QMS) should be specified (goals, objectives, action plans, reporting, etc.);
2. The role of students in developing and implementing the policy of quality assurance through relevant structures and procedures is not clearly defined;
3. The information on meeting the requirements of **Standard 3 Student centered learning** is not sufficient. There are only few examples of the students' participation in the development of study programmes, the programmes of work placement, etc;
4. The Panel would like to see a more detailed analysis of the employer, student and teacher surveys from the point of view of the standards of quality of ESG-ENQA;
5. There is not enough information on the students' progression and achievements and the career development of the graduates, including the information on the University's and Faculty's websites;
6. The data on research activity of the staff are not available, specifically, information on Chemistry Ranking QS;

7. There are some minor typos, repetitions, factual errors; some acronyms are not explained (pp.21,32,33, Annex 9, etc.).

The following issues should be given a special analysis during the site visit:

1. The monitoring of the quality assurance system of study programmes;
2. The system of incentives and professional development of the teaching staff;
3. The system of independent quality evaluation;
4. The system of employers' involvement;
5. Graduates' employment in the last three years;
6. Material and technical resources;
7. The system of labour safety in the programme;
8. Organization and support of students' independent work;
9. The monitoring of students' research work;
10. Completeness and accuracy of information on the study programmes;
11. Organization and quality of academic mobility of students and staff;
12. International activity.

It is necessary to receive more information about:

1. Syllabi and working programmes of disciplines; pools of assessment tools;
2. Regulations on final and interim attestation of students;
3. Student Guidelines for independent work;
4. Information on work placement;
5. Documents regulating cooperation with strategic partners;
6. Employers' feedback about the graduates of the programmes;
7. Information on library and network resources;
8. Reports on the surveys of students, teachers, graduates and employers.

According to the standards and criteria of accreditation of NCPA and HEEC the preliminary assessment of the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) may be defined as full compliance.

1.4.2 Site-visit

The review panel visited National Research Tomsk State University on October 23-25, 2019 with the purpose of confirming the accuracy of the information, which was presented in the self-evaluation report, collecting extra information on the implementation of the accredited programme and checking its compliance with the standards and criteria of NCPA and HEEC developed in accordance with the European standards of education quality assurance.

The time line and the agenda of the site-visit were determined by NCPA together with HEEC and approved by the administration of National Research Tomsk State University and the members of the Review Panel.

During the site-visit the Review Panel members conducted a number of meetings and interviews with the University administration, people responsible for accreditation, Dean and Deputy Deans of the Faculty of Chemistry, Heads of Departments, graduates, teachers, students and representatives of professional community.

The Chair of the Review Panel managed the Panel's work.

The Panel considers that the self-evaluation report which was presented by TSU provided the experts with an opportunity to form an integral view on specific features of implementation of the reviewed study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and applied chemistry» (04.05.01).

The studied documents and the interviewed persons, visits to the Department, the University library and laboratories provided the Review Panel members with sufficient information about reviewed study programmes.

The Review Panel considers it necessary to highlight the effective cooperation of the experts, NCPA and HEEC employees during the site-visit and its preparation.

The Review Panel notes the highest level of organizational provision and constructive work.

The executive staff of TSU provided the administrative support, which included arrangement of meetings and interviews, provision with working space, computers with access to the Internet, necessary research, academic and methodological documents.

During the site-visit the Review Panel members requested additional documents during the site-visit to National Research Tomsk State University.

On the last day of the site-visit the Chair of the Review Panel presented an oral report on the general conclusions to the executive staff of the University, Dean of the Faculty, and Heads of Departments.

The agenda of the site-visit can be found in the Annex.

1.4.3 Conclusion on the findings of the external review

Based on the results of the external review of National Research Tomsk State University the Review Panel submitted the Report on the results of the external review of the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and Applied Chemistry» (04.05.01) delivered by the educational institution.

The draft report of 35 pages excluding Annexes was developed by the Chair of the Review Panel, approved by the other Review panel members and submitted to the National Centre for Public Accreditation. Then the Report was mailed to the University's administration for making factual amendments.

2. DESCRIPTION OF THE STUDY PROGRAMMES

The main professional study programmes (MPSP) in «Chemistry» (04.03.01, 04.04.01) and «Fundamental and Applied Chemistry» (04.05.01) delivered by National Research Tomsk State University, are developed according to the Federal State Educational Standards (FSES), approved by the Ministry of Education and Science of the Russian Federation, and Independently Established Educational Standards (IEES) developed and approved by Tomsk State University.

The bachelor programme «Chemistry» 04.03.01 has one profile – «Chemistry», with elective modules «Inorganic Chemistry and Materials Chemistry», «Analytical Chemistry», «Organic Chemistry», «Physical Chemistry», «Macromolecular Compounds», «Petrochemistry», «Environmental Chemistry, Chemical Expertise and Ecological Safety». There are two Master programmes: «Fundamental and Applied Chemistry of Substances and Materials» and «Translational Chemical and Biomedical Technologies». The Specialist study programme 04.05.01 «Fundamental and Applied Chemistry» includes elective modules «Inorganic Chemistry and Materials Chemistry», «Analytical Chemistry», «Organic Chemistry», «Materials Chemistry» «Physical Chemistry», «Macromolecular Compounds», «Petrochemistry», «Environmental Chemistry, Chemical Expertise and Ecological Safety».

The cluster of educational programmes has goals and objectives aimed at the development of personal qualities and forming universal general professional competencies in accordance with the requirements of FSES and IEES.

Tomsk State University, as a university of the research type, sees its mission in preserving and enhancing spiritual values of humanity in the production and dissemination of progressive knowledge and information, and in the advanced training of the intellectual leaders of society based on integration of the educational process with fundamental scientific research and innovative approaches.

The priority of the University is to bring up a creative personality with a broad outlook capable of independent research and worldview decisions. Preserving its loyalty to old established traditions the University's staff is actively developing modern approaches and methods in all spheres of activity, strengthening its position in the Russian and international research and education area.

In accordance with the University's mission the mission of the Faculty of Chemistry consists in carrying out educational, research, and socio-cultural activities in training highly qualified specialists with fundamental knowledge in the sphere of Chemistry, which have skills in experimental work and special skills and abilities in their professional area.

The Study Programme «Chemistry» is aimed at preparing highly qualified specialists possessing fundamental and applied knowledge of Chemistry and able to do research and solve fundamental and applied problems in Chemistry. The programme is designed to develop universal, general professional, and professional competencies in compliance with the requirements of the Federal State Educational Standard of Higher Education in subject area 04.03.01 Chemistry. A special feature of the programme is its focus on preparing graduates for professional activities in Chemistry, chemical, biochemical, petrochemical, oil refining, and other related fields of industry and science.

The aim of the Study Programme «Fundamental and Applied Chemistry of Substances and Materials» is to prepare Master's students in Chemistry who know modern methods of synthesis and research on substances and materials of various nature, able to study, do experiments, and teach, able to work independently in research institutions and production companies and chemical, petrochemical, pharmaceutical and other related industries and at the universities of chemistry and technology as teachers. The intended competences are formed on the basis of students' personal qualities and principles of comprehensive approach to the teaching process.

The programme implements a new paradigm of Chemistry education focuses on preparing Master's students in Chemistry and makes it possible to deal with complicated tasks in research and pedagogical spheres of activity.

The study programme «Translational Chemical and Biomedical Technologies» aims to prepare Master's students able to work independently in research and production institutions and chemical, petrochemical, pharmaceutical and other related industries and at universities of the chemistry and technology profile as teachers. The study programme is intended to combine chemical and biotechnological approaches to the development and implementation of new chemical substances and materials for biomedical purposes, modern diagnostic and therapeutic methods and tools.

The study programme «Fundamental and Applied Chemistry» aims to prepare highly qualified specialists possessing fundamental and applied knowledge and able to independently and effectively implement innovations in chemical industry, science, and education. The programme is designed to develop universal, general professional and professional competencies in compliance with the requirements of the Federal State Educational Standard of Higher Education in Fundamental and Applied Chemistry.

Of great importance is preparing graduates in the field of modern materials studies and nanotechnology. Graduates of the programme are prepared for research, pedagogical, and technological activities.

3. FINDINGS

3.1 Standard 1. Policy (goals, development strategy) and quality assurance procedures of the study programmes

*Compliance with the standard: **full compliance***

Table 1 - Criteria to Standard 1

Nº	Subject of Evaluation	Mark
1.	Availability of a documented inner quality assurance system providing continuous enhancement of quality in accordance with the developmental strategy of the educational institution	A
2.	Participation of all stakeholders (administration, teaching staff, students, employers, employer associations, branch ministries and departments – key partners in employment of graduates) in developing and implementing a quality assurance policy through relevant structures and processes	B
3.	Participation of all structural units of an educational institution in quality assurance processes and procedures	A

Analysis of the educational programmes' compliance with the standard:

The cluster of study programmes 04.03.01, 04.04.01 «Chemistry» and 04.05.01 «Fundamental and Applied Chemistry» is delivered on the basis of developed and approved documents regulating the content, organization and quality assurance of the educational process. These documents are publicly available on the website of the University and the Faculty of Chemistry.

The vision of the long-term prospects, regional specific features, goals and objectives of the cluster of the study programmes correspond to the goals and objectives of the basic documents:

- Development Programme of Tomsk State University for 2010-2019;
- Strategy of Social and Economic Development of Tomsk Region till 2030;
- Programme of Strategic Development of the Faculty of Chemistry for 2017-2021.

Y. Slizhov, Faculty Dean, V. Shelkovnikov, Deputy Dean for Academic Affairs, T. Minakova, Executive in charge of the Quality Management System of the Faculty of Chemistry, and Heads of Departments (V. Kozik, A. Mamaev, O. Vodiankina, A. Vosmerikov) supervise the Faculty's work in education quality that contributes to the development of the University quality management system.

The internal quality assurance system provides continuous improvement of the educational process quality. The Faculty of Chemistry updates the processes and procedures of internal quality assurance taking into account scientific development, changes in the legal framework, and renewal of methods of the educational process organization.

Achievements:

1. The goals and development strategy of the study programmes are clearly defined and correspond to the mission and the development strategy of the region, University, and Faculty.

2. The system of the programmes' management at different levels is effective.
3. All stakeholders, including administration, teachers, students, employers, graduates and all University subdivisions, are involved in policy and quality assurance procedures.
4. There are resources necessary for the internal system of quality assurance (personnel, material and technical resources, etc.).

Recommendations:

1. Systematic collection and analysis of feedback from applicants and students on their motivation and satisfaction with learning conditions should be provided.
2. The range of employers participating in monitoring studies should be extended and the partnership should be strengthened by cooperation agreements.
3. The mechanisms of quick response to changing conditions of the labour market should be developed by effective cooperation with regional employers.

3.2 Standard 2. Design and approval of programmes

Compliance with the standard: **full compliance**

Table 2 - Criteria to Standard 2

№	Subject of Evaluation	Mark
1.	Availability and accessibility of clearly defined, documented, approved and published goals and objectives of a study programme and expected learning outcomes and their correspondence to the mission and goals and objectives of the educational institution	A
2.	Availability of procedures for design, approval and revision of a study programme (including expected learning outcomes) with the account of the development of science and industry, and also with the consideration of stakeholder opinions (administration, teaching staff, students, employers)	B
3.	Consideration of the requirements of professional standards (if available), of labour market, of national qualification framework descriptors in the study programme	B

Analysis of the educational programmes' compliance with the standard:

The update and adjustment mechanisms of the study programme in compliance with the labour market requirements are specified in the Regulations on the Study Programme.

The reasons for updating the programme are the following: development of priority areas of science and technology; initiative and proposals of programmes supervisor; results of programmes' quality evaluation; significant changes in conditions of programmes' delivery, including changes in the Federal State Educational Standards of Higher Education and TSU Standards. Updates are reflected in such documents as curriculum, syllabi, programmes of work placement, etc.

Professional standards and labour market demands result in necessary changes in the programme. Consumer requirements are defined through monitoring of the labour market and graduates' activity and employment.

The mission, goals and expected learning outcomes comply with the mission of the University, which is an educational, research and cultural centre.

Achievements:

1. Clear mechanisms for updating and adjusting the study programmes are in place.
2. The programmes are focused on the requirements of the labour market and professional standards.
3. Employers are involved in the delivery and management of the programmes (discussion of objectives, modules of practical classes, targeted selection of graduates during their study).

Recommendations:

1. The monitoring should be carried out to assess market conditions and competitors in the educational market in order to effectively transform the programmes and adjust them to specific consumers.
2. Development, approval and adjustment of the cluster of study programmes should be carried out together with TSU foreign partners.
3. The requirements of new professional standards should be taken into account in the study programmes.

3.3 Standard 3. Student-centered learning, teaching and assessment

*Compliance with the standard: **substantial compliance***

Table 3 - Criteria to Standard 3

Nº	Subject of Evaluation	Mark
1.	Consideration of needs of diverse groups of students and a possibility to create individual learning paths	A
2.	Use of methods encouraging students to take an active part in creating the learning process	A
3.	Use of clearly defined criteria and objective assessment procedures of learning outcomes/ competences of students corresponding to the expected learning outcomes, goals of the study programme and their purpose (diagnostic, formative or summative assessment)	B
4.	Information about the study programme, criteria and procedures for assessment of learning outcomes/competencies, about examinations, tests and other types of control.	B
5.	Use of procedures of independent assessment of learning outcomes	B
6.	Availability and effectiveness of appeals procedure and procedures for dealing with students complaints	B

Analysis of the educational programmes' compliance with the standard:

Student-centred learning is a priority in the university development. It takes into consideration personal characteristics and requirements of students, independent work and reflection, and raising personal responsibility for learning outcomes. The main instrument of this approach is a learning-by-doing method.

Learning can be organized in line with both the standard curriculum and academic calendar and an individual learning plan. The elective courses listed in the syllabi are available on the official website.

The student-oriented learning environment enables the students to demonstrate their intellectual abilities and creative potential through participation in scholarship contests, grants, conferences, scientific seminars, etc.

The questionnaire is one of the methods actively used to encourage students to participate in the design of the learning process. Surveys help to obtain reliable and unbiased information on strengths and weaknesses of the learning process.

In order to ensure students' rights to participate in the University management and to address important issues of student life, public activity, support and implementation of social initiatives, the Joint Council of Students has been founded. During the last two years A. Meretin has been the Council Chair.

The cultural and public life of students is supported by the Student Trade Union and the Faculty Students Union. They annually organize events like the Freshman Day, Initiation Party, Halloween in English, and Mister and Miss of the Chemistry Faculty. More than 50 different sports events take place every year.

Students from low income families are supported with financial aid.

In order to create comfortable social and cultural conditions for life and study of overseas students, the TSU International Division has set up the Department of Social Adaptation and Support of TSU International Students.

Achievements:

1. The programmes are designed in line with the needs of different groups of students. Student-centred excessive learning environment contributes to student development.
2. The programme of campus courses is introduced.
3. The elective intensive courses of the English language are delivered in order to improve student linguistic competences.
4. Clear criteria of learning outcomes evaluation are developed. The assessment procedures of student knowledge correspond to the requirements of the current regulating documents, Federal State Educational Standards of Higher Education and TSU IEES. Measures are taken to develop student competences that correspond to the expected learning outcomes, goals and objectives of the study programmes. The assessment of retained knowledge, current and final assessment are carried out.

Recommendations:

1. The students should be informed about the study programmes.
2. The electronic educational courses should be actively used in the educational process; learning materials should be published in the «Moodle» system.
3. The programmes of further professional education developed by degree granting Departments should be introduced when designing the individual learning paths, including the programmes for blue-collar jobs (for example, chemistry lab technician).

- The work on the adjustment of campuses for people with special needs should be continued.

3.4 Standard 4. Student admission, support of academic achievements and graduation

Compliance with the standard: **full compliance**

Table 4 - Criteria to Standard 4

№	Subject of Evaluation	Mark
1.	Systematic career guidance work targeted at the recruiting and selection of applicants should be in place	A
2.	Availability and effectiveness of rules and regulations for admission, transfer of students from other educational institutions, recognition of qualifications, periods of study and prior learning	A
3.	Systematic work to support students' progression	A
4.	Recognition of higher education qualifications obtained in the RF and abroad (Diploma Supplement)	A
5.	Participation of students in mobility programmes	B

Analysis of the educational programmes' compliance with the standard:

Career guidance is carried out with the participation of the teaching staff.

The students are involved in research competitions, conferences, grants provided by TSU funds and other organizations. The students can get information about all relevant events at the University Youth Centre (Mayor's Prize, Governor's Prize, V. Potanin Charity Fund, V.I. Vernadskiy Non-Government Environmental Fund, etc.).

Research mainly results in publication of materials, reports, and research articles in collections and journals registered in the databases of the Russian Science Citation Index, Scopus, and Web of Science.

The TSU Youth Centre, Academic Office of the Faculty, and StrAU inform students, collect and analyse their academic achievements, and publish information on competitions and scholarships on the websites. The students take part in scholarship contests. The system «Flamingo» provides students with complete information about their participation and achievements in conferences, olympiads, and competitions.

The TSU Centre for Academic Mobility organizes mobility of students and teachers as part of the programme for TSU competitiveness improvement.

Financing is carried out on a competitive basis for the following types of mobility: international summer schools, academic seminars, international conferences, short-term exchange programmes, and joint student research projects.

Achievements:

- The admission procedure is effective.
- The academic progress and implementation of corrective actions are under regular control.
- Career guidance work is regularly carried out.

4. The students can carry out research and projects in leading research centres of the region.
5. There are conditions for academic mobility.
6. The system of financial and non-financial support of student academic achievements is in place.

Recommendations:

1. The students should actively participate in the programmes of international and internal mobility.
2. The number of foreign students participating in exchange programmes should be increased.
3. The students should actively apply for and participate in competitions for grants supported by research foundations, targeted programmes of the Ministry of Science and Higher Education, etc.
4. Clearer rules and procedures of students' admission should be published on the English version of the website to increase the number of foreign students.

3.5 Standard 5. Teaching staff

*Compliance with the standard: **full compliance***

Table 5 - Criteria to Standard 5

Nº	Subject of Evaluation	Mark
1.	Qualification and competence of the teaching staff : – Academic degrees and titles; – Industry and state awards and prizes; – Practical experience; – Published text books, handbooks and methodological guidebooks	A
2.	Relevance of specialists, degrees and titles and /or practical experience to the profile of the study programme	A
3.	Research activity of the teaching staff, implementation of research results in the academic process	A
4.	Use of innovative teaching methods and advanced technologies	B
5.	Visiting lecturers from other educational institutions including those from abroad	B
6.	Participation of the teachers in joint international projects, internships abroad, academic mobility programmes	B
7.	A system of financial and non-financial incentives for teachers	A
8.	Availability and use of clear, transparent and objective criteria for: – Hiring staff including teachers from foreign educational institutions, assignment to positions, promotion, dismissal; – Dismissal of teachers with low level of professional competency	A
9.	A system for career development and professional advancement for teachers	A

Analysis of the educational programmes' compliance with the standard:

The qualifications of the teaching staff involved in the delivery of the study programme cluster meet the requirements of the FSES.

In the period from 2016 to 2018 the teaching staff of the Faculty of Chemistry published 405 articles in scientific periodicals indexed in the databases of Russian Science Citation Index, Scopus, and Web of Science, patented 37 inventions and received research funding in the amount of 446,205 million rubles.

The members of the teaching staff of the Faculty of Chemistry regularly participate in international research events and internships. In the summer of 2019 research teams of the Faculty participated in 3 international events; The 8th Asia-Pacific Congress on Catalysis (APCAT-8) held in Bangkok, Thailand on 4-7 August 2019 (5 lecturers, 1 undergraduate and 2 postgraduate students), European Congress on Catalysis EUROPACAT-2019 held in Aachen, Germany on 18-22 August 2019 (4 teachers, 3 postgraduate and 2 undergraduate students), 3rd European Summer School on Catalyst Preparation held in Vogüé, France on 16-21 June 2019 (3 teachers).

The staff members enjoy financial and non-financial incentives for achievements in teaching, research and other academically related activities implemented at the University. The teaching staff of the faculty of Chemistry are actively involved in implementing grant programmes and projects, thus developing their research and creative potential and raising financial remuneration.

The Faculty has in place a schedule of training and re-training for teachers. In accordance with this schedule the teachers improve their skills through various external training and academic mobility programmes and internships in the country and abroad.

Achievements:

1. The qualifications of the teaching staff involved in the delivery of the cluster of study programmes "Chemistry" (04.03.01, 04.04.01) and "Fundamental and Applied Chemistry" (04.05.01) meet the requirements of the FSES of HE.
2. Active involvement of the teaching staff in research and project work (national and international) ensures a high level of student training in the context of study programmes undergoing accreditation.
3. TSU has in place an effective system of professional development for the teaching staff.
4. The members of the teaching staff of the Faculty are highly motivated to take part in skills development programmes.
5. The teaching staff of the Faculty are actively involved in research activities: they supervise students' research work, serve as members of the Board for awarding academic degrees, defend their theses, take part in high-profile conferences, publish the results of their research work in high impact journals, journals indexed in Web of Science, Scopus, Russian Science Citation Index.

Recommendations:

1. It is recommended that the incentive scheme should be developed in order to reach out to new staff members.
2. It is advisable to involve employers from the related industries to deliver lectures, workshops and research and practical seminars.
3. Representatives from the real economy sector should be included in preparing and implementation of grant applications.

- It is recommended that more visiting professors should be invited to deliver lectures on the latest achievements in the cutting edge chemical sciences.

3.6 Standard 6. Learning resources and student support

*Compliance with the standard: **full compliance***

Table 6 - Criteria to Standard 6

Nº	Subject of Evaluation	Mark
1.	Provision of the study programme with material and technical recourses in accordance with the requirements of the curriculum (modern tools, equipment, computers, classrooms, laboratories)	A
2.	Availability of up-to-date library and information resources including those for independent study and research work	A
3.	Availability of infrastructure to ensure access to quality education to students with different opportunities and of different age, and to provide the development of social and educational component of the academic process	A
4.	The system of feedback on the satisfaction with conditions and organization of the study process should be in place	B
5.	Availability of accessible information about opportunities for student mobility and its support system	B

Analysis of the educational programmes' compliance with the standard:

The learning resources used for all kinds of educational activities in the cluster of study programmes meet the requirements of the FSES and IEES to the full extent.

The departments, research laboratories, multiple-access centers of TSU provide their state-of-the-art academic and research equipment for the programme delivery.

All the reading halls of TSU research library are equipped with computers and ensure open access to vast information resources.

Class schedule is available in the automated information system and on the TSU website.

Social and educational work at the University is organised by the Department of Social and Youth Policy, which includes Students Trade Union, Teachers Trade Union, and Joint Council of Students.

Students may opt to join student associations, hobby clubs (music, drama, sports, etc).

The University Center for Academic Mobility of TSU organises inbound and outbound academic mobility, provides consultancy to undergraduate and postgraduate students, and staff members of TSU.

The Center for Joint Educational Programmes is responsible for internationalization of higher education, design of joint double degree programmes, and inclusive education. The Center also promotes academic mobility of TSU teachers and students.

Various university units collect student feedback. Survey is one of the most effective feedback tools.

Feedback for immediate issues regarding organization of the process of education is shared via social media corporate group. The results of quality assessment are used by the University governing bodies for timely correction of the programme design.

Achievements:

1. The learning resources and equipment used for the delivery of the cluster of study programmes undergoing accreditation make it possible to implement the educational process in full compliance with the FSES of HE. Competitive facilities of the Faculty of Chemistry including modern physical and chemical equipment make it possible to arrange academic and research activities in the most effective way.
2. Students and teachers benefit from open access to a wide range of national and international information resources and databases. All students actively use e-learning academic resources, which ensures high level of student training.
3. The social infrastructure of the University ensures accessibility of quality education for learners with disabilities and from different age groups. Counseling and support services provided at the University contribute to efficient learning, professional and cultural development of TSU students.
4. The student consultancy unit provides effective student support all through the training period in bachelor, master and/or specialist programme.

Recommendations:

1. It is recommended that the software used in the educational process should be regularly updated in line with the modern development trends in education.
2. It is advisable to develop the system of maintenance of academic hardware.
3. TSU should improve the existing practice of student survey aimed at sharing feedback on the quality of the delivered study programmes and conditions of their implementation.

3.7 Standard 7. Collection, analysis and use of information for managing the study programme

Compliance with the standard: **substantial compliance**

Table 7 - Criteria to Standard 7

№	Subject of Evaluation	Mark
1.	Availability and effectiveness of the system for collecting and monitoring information about the study programme	A
2.	Participation of students and staff of the educational institution in collecting and analyzing information for managing the study programme	B
3.	The educational institution should have in place a unified effective information system on the basis of modern information technologies for managing the study programme	B

Analysis of the educational programmes' compliance with the standard:

The data on the content of study programmes are available on TSU website. The overview of the programmes and teacher profiles, assessment tools and learning outcomes are available at the Website of the Faculty of Chemistry, at the website of the programme "Translational Chemical and Biomedical Technologies", at "Vkontakte" social media, in the MOODLE system and corporate account.

The process of education is planned and managed via e-learning information environment.

AIS "Persona" contains relevant data on every staff member of TSU. The system reflects the teacher's profile with academic indicators. The data are used for planning teacher workload and career promotion.

Information system "Flamingo" tracks students' achievements.

University activities are managed using AIS "1C Enterprise"

Achievements:

1. There is in place an effective system of collecting information and managing the implementation of the study programmes aimed at different groups of users, which enables making managerial decisions based on modern information technologies.

2. The students have access to complete and accurate information on study programmes.

3. Effective teacher-student communication is facilitated via the MOODLE system.

Recommendations:

1. It is recommended that employers should be involved in evaluation and monitoring of the quality of education.

2. The University should maintain communication with the alumni on a regular basis using for this purpose the Faculty website.

3. The Panel encourages the teachers of the Faculty of Chemistry to continue developing e-learning resources and personal websites.

3.8 Standard 8. Public information

Compliance with the standard: **substantial compliance**

Table 8 - Criteria to Standard 8

Nº	Subject of Evaluation	Mark
1.	Effective use of the official website of the study programme for its quality enhancement	B
2.	Publication of complete and accurate information on the study programme and its achievements on the official website of the educational institution and mass media	B
3.	Publication of objective data on the employability of graduates	B
4.	Integration in the environment, interaction of the educational institution with different professional associations and other organization including those from	B

Analysis of the educational programmes' compliance with the standard:

The public is informed about the study programmes under accreditation through various communication channels. The official website plays a significant role in this regard.

The University and the Faculty of Chemistry publish information about the events held by the Faculty: international and national conferences, competitions, olympiads, public lectures, workshops, etc.

The website «Applicant» contains information about admission, regional, national and international events for applicants, results and achievements of students.

In addition to the official publication on the Internet pages, TSU uses internal advertising and information resources such as newspaper AlmaMater, spreads advertising brochures with information about the Faculty and study programmes, and presents the programmes at various national and international forums and conferences.

The TSU Employment and Career Service annually publishes the results of graduates employability according to the monitoring data of the Ministry of Science and Higher Education and the Pension Fund of the Russian Federation.

Achievements:

1. The official websites of the University and the Faculty of Chemistry contain full information about the programme.
2. Cooperation of teachers with various educational and professional institutions promotes public information about the study programmes.
3. The information on employability and demand for graduates is updated. The students and graduates have an access to relevant information about vacancies.

Recommendations:

1. The web pages of the Departments and personal information about the University staff should be regularly updated.
2. The information section «Our Graduates» should be developed in order to allow employers to give feedback on practical activities and success stories of graduates.
3. The University resources should be more actively used to promote the cluster of study programmes abroad.

3.9 Standard 9. On-going monitoring and periodic review of programmes

*Compliance with the standard: **full compliance***

Table 9 - Criteria to Standard 9

Nº	Subject of Evaluation	Mark
1.	Documented procedures of monitoring and periodic review of study programmes should be in place	A
2.	Availability of a feedback mechanism for students, employers, branch ministries and departments (key stakeholders in employment) in the process of	A

	monitoring and periodic review of a study programme	
3.	Effectiveness of procedures for monitoring and periodic review of a study programme (enhancement of programmes)	B

Analysis of the educational programmes' compliance with the standard:

Review of the content of the study programmes is carried out, firstly, in order to bring them into compliance with the requirements of the Federal State Educational Standards / Independently Established Educational Standards of TSU and requirements of professional standards, and secondly, in order to take into account, the latest scientific achievements (once every 1-2 years). The teachers of the disciplines are responsible for making changes in the syllabi of the disciplines. Changes in the assessment tools, curriculum, content of the study programmes, and other organizational documents are introduced by the Head of the study programme with the agreement of the administration of the Faculty of Chemistry and the TSU Academic Division.

The combination of the procedures of external and internal evaluation of the cluster of study programmes makes it possible to adequately assess the level of the achievement of the goals and expected outcomes.

Mechanisms for receiving feedback from stakeholders are specified in the study programmes. Moreover, some disciplines have been developed in collaboration with prospective employers who are part-time teachers at the Faculty of Chemistry.

The curricula for the study programmes Chemistry (Bachelor's) and Fundamental and Applied Chemistry (Specialist's) are created so that students are able to transfer from one programme to another regarding their scientific and professional interests during the first 3 years without making up for academic differences.

Achievements:

1. Regular updating of the study programmes: curriculum, methodological and administrative documents in accordance with the internal regulations.
2. The developed procedures of monitoring and periodical review of the cluster of study programmes make it possible to timely introduce the necessary changes in the content of syllabi taking into account new developments in science and education, the requirements of students and employers, etc.
3. The curriculum, syllabi, the schedule of the academic process are formed in the specialized package "PLANS".

Recommendations:

1. The feedback from employers and graduates should be gathered and systematized when making corrections in the syllabi and working programmes of the disciplines at the major departments and the Faculty levels.
2. It is recommended that foreign specialists should be involved in the monitoring of the study programmes.

3.10 Standard 10. Cyclical external quality assurance of study programmes

Compliance with the standard: **full compliance**

Table 10 - Criteria to Standard 10

Nº	Subject of Evaluation	Mark
1.	Periodic review of a study programme	A
2.	Availability of a corrective actions programme to follow up the results of external evaluation of study programmes	B
3.	Consideration of the results of previous procedures of external evaluation when conducting subsequent external procedures	B

Analysis of the educational programmes' compliance with the standard:

In 2017, the study programmes successfully passed state accreditation. The external evaluation assessment by the experts of the Ministry of Education and Science of the Russian Federation did not reveal the need for correction of the study programme. The Federal Service for Supervision in Education and Science did not identify any major efficiencies and violations in the organization of the learning process in April 2018.

Considerable attention is paid to the procedures of external evaluation by Russian and international ranking agencies: Expert RA, QS University Rankings, Round University Ranking.

Employers take part in independent assessment of graduates on a regular basis. They assess graduates' professional competencies when participating in the work of the State Examination Board, reviewing Bachelor theses and the study programme, etc.

The Members of the State Examination Board confirm practical orientation and feasibility of the development of the theses topics. Theses topics are annually updated because of new projects and grants carried out by students and graduates at the Faculty of Chemistry.

Victories and prizes of teachers and students in competitions in various activities confirm professionalism and development of personal qualities of contestants and serve as an example of an independent assessment by the professional community.

Successful employment of graduates and positive feedback from employers also serve as an indicator of the positive external evaluation of the programme.

Achievements:

1. As follow up on the procedures of state final attestation with the participation of employers and representatives of relevant government departments a comprehensive corrective actions plan is being developed, which includes a system of actions by the major department on modernizing the academic process, strengthening students' independent work, enhancing methodological and research activities of the teachers.
2. External evaluation of the quality of the study programme is carried out on a regular basis with the involvement of representatives of professional community and key employer partners.

Recommendations:

1. An independent of the Ministry of Education external evaluation of the quality of study programmes should be made regular.
2. The corrective actions programmes on the outcomes of the external evaluation of the study programmes should be publicly available on the University website.
3. The outcomes of the external evaluation of the study programme should be made available to employers and representatives of the academic community.

4. RECOMMENDATIONS FOR IMPROVEMENT

Thus, based on the analyses of the presented documents, meetings and interviews, conducted during the site-visit, with the purpose of enhancing the quality of implementing the educational programme under accreditation the Review Panel recommends:

1. The programmes of professional development and annual methodology seminars «European Standards for Education Quality Assurance ESG-ENQA» should be organized at the University.
2. The content of the delivered lectures should be carried out; their electronic versions available for all stakeholders (students, employers, etc.) should be created.
3. A representative of students responsible for cooperation (feedback) with the Faculty administration and the Departments should be appointed (for joint design of the educational process, mobility programmes, evaluation of conditions and organization of the educational process, etc.).
4. Students and employers should be involved in the development of the study programmes by participating in regular monitoring of stakeholders' opinions.
5. Joint programmes with leading foreign universities should be delivered in the Russian and English languages.
6. The information on the study programmes delivered in TSU should be published in the national portals targeted at the foreign public.
7. The information on achievements of the cluster of study programmes in comparison with the faculties of other Russian and foreign educational institutions should be published.
8. The English version of the University website should be updated and the English version of the Faculty website should be created.
9. The public should be informed about the results of external quality assurance procedures of the cluster of study programmes.

5. CONCLUSION

Based on the self-evaluation report analysis, documents and data submitted the External Review Panel has come to the conclusion that the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and applied chemistry» (04.05.01) **fully comply** with the standards and criteria of public accreditation of the National Centre for Public Accreditation.

The Panel recommends that the National Accreditation Board accredit the study programmes in «Chemistry» (04.03.01, 04.04.01), «Fundamental and applied chemistry» (04.05.01) delivered by National Research Tomsk State University for the period of **6 years**.

ANNEX A

SCHEDULE OF THE SITE VISIT OF THE EXTERNAL REVIEW PANEL

Time	Activity	Participants	Venue
22 October, Tuesday			
	Meeting at the airport		
23 October, Wednesday			
8.30	Arrival at TSU		
08.45 – 10.30	First meeting of the Panel		room 7, Research library
10.30 – 12.00	Meeting of the ERP with the University administration and people responsible for accreditation	Rector, Vice-Rectors, people responsible for accreditation, ERP (External Review Panel)	room 7, Research library
12.00 – 13.00	Visiting Research library	ERP	
13.15 – 14.15	Lunch		Main building, café "Minutka"
14.15 – 15.00	Tour of the University	ERP	Research library
15.15 – 16.15	Meeting with Deans and Deputy Deans	Deans, Deputy Deans, ERP	room 7, Research library
16.15 – 16.45	Work with documents	ERP	room 7, Research library
16.45 – 17.45	Meeting with Heads of Departments	Heads of Departments, ERP	room 7, Research library
17.45 – 18.00	Internal meeting of the Panel	ERP	room 7, Research library
18.00 – 19.00	Meeting with Graduates	Graduates,, ERP	room 7, Research library
19.00 – 19.30	Internal meeting of the Panel	ERP	room 7, Research library

Time	Activity	Participants	Venue
24 October, Thursday			
8.45	Arrival at TSU		
09.00 – 10.00	Meeting with teachers	Teachers, ERP	room 7, Research library
10.00 – 10.30	Internal meeting of the Panel	ERP	room 7, Research library
10.30 – 11.30	Meeting with students	Students , ERP	room 7, Research library
11.50 – 13.00	Profile excursion	ERP	Building 6
13.15 – 14.05	Lunch		Main building, café "Minutka"
14.35 – 15.35	Meeting with employers and representatives of Tomsk Scientific Research Institute of Oncology	Representatives of employers, ERP	Tomsk Scientific Research Institute of Oncology
16.10 – 17.10	Meeting with employers	Representatives of employers, ERP	room 7, Research library
17.10 – 19.00	Work with the final report	ERP	room 7, Research library
25 October, Friday			
8.45	Arrival at TSU		
09.00 – 12.00	Internal meeting of the Panel: discussion of preliminary results of the site visit, preparation of the oral report of the panel	ERP	room 7, Research library
12.00 – 13.30	Closing meeting of the External Review Panel with the representatives of the University	ERP, University administration, Heads of the Graduate Departments, teachers, students	room 7, Research library
13.30 – 14.30	Lunch		Main building, café "Minutka"
	Departure		

ANNEX 5

PARTICIPANTS OF THE MEETINGS

Administration and people responsible for accreditation

№	Name	Position	Contact information
1.	Kulizhsky Sergei Pavlinovich	acting rector	rector@tsu.ru 8-(3822)-529-852
2.	Mayer Georgy Vladimirovich	president	8-(3822)-529-499
3.	Gasheva Yulia Vladimirovna	acting vice-rector for international relations	8-(3822)-529-644
4.	Brel Elena Yurievna	acting vice-rector for international relations education	8-(3822)-529-481
5.	Rudenko Tatiana Vladimirovna	director of the Centre of accreditation	rudenko@ido.tsu.ru 8-(3822)-529-552
6.	Karpova Natalia Aleksandrovna	specialist of the Centre of accreditation	8-(3822)-529-552
7.	Maslennikova Olga Georgievna	director of the Centre for joint educational programmes	pro-77@mail.ru 8-(3822)-526-359
8.	Slizhov Yury Gennadievich	dean of the Faculty of Chemistry	dekanat@chem.tsu.ru 8-(3822)-423-944
9.	Shelkovnikov Vladimir Vitalievich	vice-dean for academic work	shvv@chem.tsu.ru 8-(3822)-421-041
10.	Kurzina Irina Aleksandrovna	head of the Institute «Smart materials and technologies»	kurzina99@mail.ru 8-(3822)-526-334
11.	Voronova Gulnara Alfridovna	manager of the Institute «Smart materials and technologies»	gulnara.voronova@gmail.com 8-(3822)-526-334
12.	Mishenina Ludmila Nikolaevna	deputy dean for Master degree programmes	lnm@chem.tsu.ru 8-(3822)-423-944
13.	Khasanov Viktor Vazikovich	associate dean of the Faculty of Chemistry	serga01net@yandex.ru
14.	Minakova Tamara Sergeevna	professor of the Faculty of Chemistry	tminakova@mail.tomsknet.ru

Deans, deputy deans:

№	Name	Position	Contact information
1.	Slizhov Yury Gennadievich	dean of the Faculty of Chemistry	dekanat@chem.tsu.ru 8-(3822)-423-944
2.	Shelkovnikov Vladimir Vitalievich	vice-dean for academic work	shvv@chem.tsu.ru 8-(3822)-421-041
3.	Kurzina Irina Aleksandrovna	head of the Institute «Smart materials and technologies»	kurzina99@mail.ru 8-(3822)-526-334
4.	Mishenina Ludmila Nikolaevna	deputy dean for Master degree programmes	lnm@chem.tsu.ru 8-(3822)-423-944
5.	Minakova Tamara Sergeevna	professor of the Faculty of Chemistry	tminakova@mail.tomsknet.ru

Heads of departments:

№	Name	Position	Contact information
1.	Kozik Vladimir Vasilievich	head of department of inorganic chemistry	vkozik@mail.ru 8-(3822)-420-802
2.	Skvortsova Lydia Nikolaevna	deputy head of department of analytical chemistry	Inskvorcova@inbox.ru 8-(3822)-421-041
3.	Vodyankina Olga Vladimirovna	head of department of physical and colloidal chemistry	vodyankina_o@mail.ru 8-(3822)-420-780
4.	Berezina Elena Mikhailovna	deputy head of department of high molecular compounds and petro chemistry	emberz@yandex.ru

Teachers:

№	Name	Position	Contact information
1.	Bugaeva Aleksandra Igorevna	senior teacher of department of organic chemistry	sandra_tsu@mail.ru
2.	Khasanov Viktor Vazikovich	associate professor of department of organic chemistry	serga01net@yandex.ru
3.	Selyunina Lylia Aleksandrovna	senior teacher of department of inorganic chemistry	selyuninala@mail.ru
4.	Botvin Vladimir Viktorovich	assistant professor of department of high molecular compounds and petro chemistry	botvinilo1991@gmail.com
5.	Kharlamova Tamara Sergeevna	assistant professor of physical and colloidal chemistry	kharlamova83@gmail.com
6.	Tuguldurova Vera Petrovna	senior teacher of physical and colloidal chemistry	tuguldurova91@mail.ru
7.	Gavrilenko Natalia Airatovna	assistant professor of department of analytical chemistry	gavrilenko@mail.tsu.ru
8.	Shumar Svetlana Viktorovna	assistant professor of department of analytical chemistry	shumar.svetlana@yandex.ru
9.	Kuznetsova Svetlana Anatolievna	assistant professor of department of inorganic chemistry	onm@xf.tsu.ru
10.	Akimov Akim Semenovich	senior teacher of department of high molecular compounds and petro chemistry	zerobox70@mail.ru

Students:

№	Name	Specialty	Course	Contact information
1.	Yan Chinwendu	Chemistry	3	https://vk.com/chinvenduyang
2.	Mikhalchenko Mark	Translational chemical and biomedical technologies	2	https://vk.com/laborant_13
3.	Serdyukova Ekaterina	Translational chemical and biomedical technologies	1	https://vk.com/id152452825
4.	Novolokov Kirill	Fundamental and Applied Chemistry	5	novolokov.kirill@gmail.com
5.	Lakeev Aleksandr	Fundamental and Applied Chemistry of substances and materials	1	lakeevs@mail.ru
6.	Mudrikova Alena	Fundamental and Applied Chemistry of substances and materials	1	alena.mudrikova@mail.ru
7.	Gigilev Aleksandr	Fundamental and Applied Chemistry of substances and materials	2	asgigilev@gmail.com
8.	Trufanov Vadim	Fundamental and Applied Chemistry	3	https://vk.com/im?peers=c1&sel=162303165
9.	Gukovich Rostislav	Fundamental and Applied Chemistry	4	https://vk.com/im?sel=191948188
10.	Reutova Olesya	Fundamental and Applied Chemistry	5	https://vk.com/im?sel=105842336
11.	Bobyleva Marina	Fundamental and Applied Chemistry	2	marinak17f@gmail.com
12.	Tikhonova Daria	Chemistry	2	dariya.dashuta@gmail.com
13.	Tsuran Daria	Fundamental and Applied Chemistry of substances and materials	1	https://vk.com/im?sel=182367456

Employers:

№	Name	Position	Contact information
1.	Cherdyntseva Nadezhda Viktorovna	deputy director for scientific work Tomsk National Research Medical Center, head of laboratory for molecular oncology and immunology	nvch@tnimc.ru 8-(3822)-51-53-42
Meeting 16.10 – 17.10			
2.	Knyazev Alexey Sergeevich	director of Engineering Chemical Technology Center	kas854@mail.ru
3.	Vorozhischeva Natalia Mikhailovna	head of laboratory "Tomskneftekhim"	VorozhischevaNM@tnhk.sibur.ru
4.	Fiterer Elena Petrovna	"NIOST"	fitererep@niost.sibur.ru
5.	Arbuzova Tatiana Nikolaevna	head of department of quality control "Artlife"	+7-9832368705
6.	Rezvan Evgeny Igorevich	head of a group "IFaR"	rezvan_eburg@mail.ru
7.	Kvach Artem Evgenievich	head of laboratory "IFaR"	https://vk.com/id56821428
8.	Shamets Natalia Viktorovna	head of department, Criminal expertise centre, Department of Internal Affairs	+7-903-952-77-20
9.	Yanovsky Vyacheslav Aleksandrovich	director for science and innovations "SpecKhimTekhnologia"	science@schemtec.ru

Graduates:

№	Name	Place of work	Position	Contact information
1.	Belik Yulia Alekseevna	TSU	engineer of laboratory	belik99q@gmail.com
2.	Rakina Apollinaria Aleksandrovna	Tomsk Polytechnic University, the Weinberg Research Center	engineer	https://vk.com/apollinariarakina
3.	Lytkin Ivan Nikolaevich	Artlife	operator	https://vk.com/lioann
4.	Yurtanova Ekaterina Sergeevna	Tomskgeomonitoring	specialist 1 category	Katya.3320@mail.ru
5.	Stefanova Anna Vladimirovna	School № 56	teacher	Stefanova24@mail.ru
6.	Kotova Anna Valerievna	"Biocad"	engineer	+7-923-408-32-56
7.	Belova Irina Gennadievna	State regional center of standardization, metrology and tests in the Tomsk region	head of test department	+7-906-198-29-36

ANNEX B

THE SCALE OF ASSESSMENT PARAMETERS OF A STUDY PROGRAMME

№	Standards	Assessment of the study programme			
		Full compliance	Substantial compliance	Partial compliance (needs improvement)	Non-compliance
1.	Policy (goals, development strategy) and quality assurance procedures of a study programme	√			
2.	Design and approval of programmes	√			
3.	Student-centred learning, teaching and assessment		√		
4.	Student admission, support of academic achievements and graduation	√			
5.	Teaching staff	√			
6.	Learning resources and student support	√			
7.	Collection, analysis and use of information for managing the study programme		√		
8.	Public information		√		
9.	On-going monitoring and periodic review of programmes	√			
10.	Cyclical external quality assurance of study programmes	√			