

**European Chemistry
Thematic Network Association**



Site Visit Report

For the application for the

CHEMISTRY Eurobachelor® LABEL

of the

St. Petersburg University

Institute of Chemistry

for the study programme

04.03.01 Chemistry (B.Sc.)

Report on the site visit to the St. Petersburg State University, in connection with the application for the Chemistry Eurobachelor® Label.

The meeting started at the Rector's wing of the St. Petersburg State University, 16.09.2019 at 14:00 in room 107. End of the meeting: 18.09.2019, at 17:30.

Composition and Affiliation of the Site Visit Team

David Aleksanyan– PhD in Engineering, engineer of technology JSC TANECO
Olga Stokolos– PhD in Engineering, Assistant professor of Russian State University of Oil and Gas
Maria Ivanova – master of 2nd year, student of Herzen University (State Pedagogical University Of Russia), Department of Organic Chemistry, St. Petersburg

Persons seen

Discussion with representatives of the institution's administration

Marina Lavrikova - The First Vice-rector for educational and methodical work.
Svetlana Begeza – The First Deputy of the First Vice-rector for educational and methodical work.
Irina Balova - Director of Institute of Chemistry.
Viktor Sorokoumov - Chairman of the Educational and Methodical Commission.
Natalia Boyko - Head of the main Department for educational and methodical work.
Marina Solovyova - Head of Educational programs Department.
Tatyana Frolova - deputy Head of educational programs Department.
Irina Grigoryeva - deputy head of educational programs Department.
Vladimir Savinov - Head of the Department for work with youth.
Svetlana Surovtseva - Head of practice and employment Department
Also programs' Heads, members of the working group, members of the Student Council.

Discussion with those responsible for the programme

Viktor Sorokoumov - Head of Bachelor programme, Ph.D. in Chemistry, associate Professor, Institute of chemistry, Department of organic chemistry.
Olga Osmolovskya– Head of Master programme, Ph.D. in Chemistry, associate Professor, Institute of Chemistry, Department of General and inorganic chemistry

Discussion with members of the teaching staff

Aleksey Timoshkin – PhD in Chemistry., Professor at the Department of General and inorganic chemistry, Head of the RNF grant.

Andrey. Shishov – PhD in Chemistry, senior lecturer, Department of analytical chemistry.

Mikhail Novikov - Doctor of Chemistry, Professor, Department of organic chemistry.

Igor Prikhodko - PhD in Chemistry, associate professor at the Department of physical chemistry, member of the educational and methodical Commission.

Mikhail Voznesensky - PhD. of Physical and Mathematical Sciences, associate professor at the Department of physical chemistry.

Peter Tolstoy - PhD in Chemistry, Professor, Department of physical chemistry, head of the grant RNF.

Olga Bakulina - PhD in Chemistry, assistant, Department of organic chemistry.

Anastasia Gowdy - PhD in Chemistry, researcher, Department of organic chemistry, head of the RSF grant, supervisor of Bachelor and Master students.

Regina Islamova – Doctor of Chemistry, Professor, Department of Chemistry of high molecular compounds.

Anastasia Penkova - PhD in Chemistry, associate professor at the Department of analytical chemistry.

Alexey Povolotsky - Doctor of Physical and Mathematical Sciences, associate professor at the Department of laser chemistry and laser materials science.

Dmitry Kirsanov – Doctor of Chemistry, Professor at the Department of analytical chemistry.

Meeting with the students

Anna Fomkina - bachelor of 2nd year, organo-analytical direction

Mariia Melnik – bachelor of 3rd year, organo-analytical direction

Vera Srikanova – bachelor of 4th year, physico-chemical direction

Svetlana Chapaikina – bachelor of 4th year, direction of inorganic chemistry

Alexander Buldakov – bachelor of 4th year, direction of organic chemistry

Maxim Tolmachyov – bachelor of 4th year, basic direction

Irina Skvortsova - bachelor of 4th year, physico-chemical direction

Elisaveta Maximova – bachelor of 4th year, analytical direction

Also Student Council representatives:

Egor Baranovsky – bachelor of 3rd year, Chairman of the faculty Student Council and Deputy Chairman of the University Student Council.

Anastasia Sadeckaya – bachelor of 4th year, Head of the Scholarship Committee.

Dmitry Lubichev – master of 1st year, the Head of the Committee on food control, Representative of the Student Council in the Educational and Methodical Commission.

Background of the visit

History of the Institution

St. Petersburg State University is one of the largest universities in Russia after MSU. M. V. Lomonosov and the oldest University in the country. St. Petersburg state University ranks 1st among all universities in St. Petersburg and 2nd in the ranking of Russian universities. Many famous scientists are graduates of St. Petersburg State University. It is considered to be the cradle of Russian science - many talented scientists in the field of Physics, Mathematics, Chemistry, who are laureates of the Nobel prize (I. p. Pavlov, I. V. Kantorovich, L. D. Landau, A. M. Prokhorov) came out of its walls.

In 1991, on the basis of a specialized Physics and Mathematics boarding school № 45 the Academic gymnasium of the University has been established. Now the Academic gymnasium is named after D. K. Faddeev and is included in the ratings of the leading schools in Russia, which trains SPBU future students.

In 2009, St. Petersburg state University was awarded the status of a unique scientific and educational complex, the oldest University in the country, which is of great importance for the development of Russian society. The special status of the University involves a separate line in the budget of the Russian Federation, the right to conduct additional testing on all major educational programs, the right to set its own educational standards, the right to confer its own degrees, the right to determine its own rules of competitions for positions of scientific and pedagogical workers, the right to issue its own diplomas, the appointment of the Rector of St Petersburg state University is made by the President of the Russian Federation.

The Institute of Chemistry of St. Petersburg state University was founded in 1929. It is an educational and research unit that provides training of a wide profile in specialties related to fundamental and applied research in the main areas of Chemical disciplines.

It includes 14 departments and three new interdepartmental laboratory: Biomedical Chemistry, Chemical pharmacology and laboratory Biohybrid technology, created in early 2018 by results of competition of Megagrants of the Russian Government. The Director Of the Institute of Chemistry is Irina Balova, Doctor of Chemical Sciences.

In continuation of the tradition of training at the Institute of Chemistry of St. Petersburg state University in Bachelor's, Master's and postgraduate programs, studies are conducted by teachers who are active in research, publish articles in prestigious international scientific journals, participate in foreign internships, manage projects supported by Russian and foreign scientific foundations. The Institute staff includes members of the RAS: academician A. Rusanov: corresponding member. V. Kukushkin, V. Stolyarova, N. Smirnova; Professor of the Russian Academy of Sciences And. Bokach, A. Bulatov, M. Krasavin.

The Institute of Chemistry provides education in the Bachelor's and Master's programs

"Chemistry" and "Chemistry, physics and mechanics of materials." The program in the field of "Chemistry" is more focused on the model of classical University education and the formation of competencies that require both deep fundamental knowledge in Chemistry and possession of practical skills in the application of modern experimental and theoretical methods. Teaching on the educational program of the Master's degree "Chemistry" is conducted in Russian and English.

Most of the lectures and practical classes are conducted by young scientists Ph.D. (under 35 y.o.) and Doctors of science (under 40 y.o.). At the same time, young scientists of the Institute of Chemistry are the Heads of 50% of projects supported by grants of RPF and RFBR.

In the educational process and for research at the world level, chemists at St. Petersburg University actively use a network of Resource centers of the Research Park, equipped with the most modern equipment.

Statistical data

According to the results of the analysis of statistical data, the list of the most popular specialties in 2019 and other years includes technologists of chemical and industrial enterprises (<https://visasam.ru/russia/rabotavrf/rynok-truda-v-rossii.html>). In addition, according to RBC, in the forecast period until 2021, a shortage of health professionals with higher and secondary specialized education, specialists with the professions of metallurgy, mechanical engineering, chemistry and petrochemistry, the production of organic compounds, the production of inorganic building materials, glass and ceramics is expected in St. Petersburg. (<https://spb.plus.rbc.ru/news/580f3f6c7a8aa9189fd69fe3>). HeadHunter.ru website showed that competition among applicants in St. Petersburg in the field of science and education is growing compared to 2018. (https://stats.hh.ru/saint_petersburg#hhindex%5Bactive%5D=true&hhindex%5Bprofarea%5D%5B%5D=14&vacancies%5Bprofarea%5D%5B%5D=14&vacancies%5Bperiod%5D=yeardynamic-vacancies%5D=year)

Grand competition and the average amount of points in three exam subjects (chemistry, mathematics, Russian language) credited to the budget / contract: 264 / - (2015); 271 / - (2016); 270 / 236.5 (2017).

Number of students:

Programme	Total number of students	budget form of education	Target financing	paid form of education

	(full-time education)				
04.03.01 Chemistry	204	196	no	8	

Subjects discussed in the self-evaluation report

1. Learning outcomes: Chemistry-based Practical Skills

201 ECTS are assigned to courses dealing with chemistry, mathematics, physics or biology. The Bachelor thesis research project carries 13 ECTS.

165 ECTN credits are allocated to practical laboratory courses. The therapeutic component in the disciplines is represented by the following types of work: seminars, workshops, tests, colloquiums and laboratory work. It forms many practical skills, for example, skill in the safe handling of chemicals, taking into account their physical and chemical properties, their toxicity and any other specific hazards associated with their use.

Before the beginning of practical training and laboratory work, students are required to pass safety. Before starting work on the final qualifying work, students listen to the course of safety, in which the requirements of safety in performing various operations, requirements for the workplace, the basics of labour protection are considered. When working in research groups, students are instructed on safety every 6 months.

13 ECTS credits are allocated for the diploma thesis, which is not enough to complete the final project. This was also confirmed during the discussion of this issue with the teachers of the Institute.

In the course of the thesis, the student performs a literary search for information on a specific topic and makes the practical part. In this case, the bachelor's formed skills are such as:

the ability to plan and organize the process of work in the laboratory;

skills necessary for laboratory experiments and the use of devices that may be required in the course of synthetic and analytical work;

the ability to interpret the data obtained from their laboratory observations and measurements in terms of their significance and their correlation with the relevant theory.

2. Content

During the analysis of the curriculum of the educational program, it was found that the student passes 71-74 disciplines for the entire course of study, depending on the choice of elective disciplines. This is a very high figure.

Study is conducted by means of individual educational trajectory, providing a basic block, variable block and block of elective disciplines. The study of a foreign language is given 3 credits in each semester from 1 to 7 (a total of 21 credits) included in the basic block of disciplines. When learning a foreign language, students are given a choice of the trajectory of learning a foreign language, depending on their level of knowledge, which is revealed by means of writing a preliminary test.

It should be noted that the program has not only separate language modules, but also integrated (basic biochemistry in English, which is located in the basic block of the 8th semester). They allow the student not only to develop the skill of reading professional literature in a foreign language, but also to perceive foreign speech by ear, which is a very popular and relevant skill today.

In the 3rd semester, students have a choice of 2 learning paths: organic-analytical and physico-chemical, disciplines of which are included in the basic block. The selection of learning path is usually distributed in equal proportions. The number of base block credits varies between 27 and 32, depending on the semester.

The total number of credits in a discipline, including a bachelor's thesis, that are related to chemistry, physics, biology or mathematics is 201 credits.

Chemistry -169

Physics -12

Biology -2

Mathematics -18

Due to the tendency of employment mainly in the field of organic or analytical chemistry in St. Petersburg, many students choose elective courses in these areas.

This approach makes it possible to prepare specialists in demand in the local and regional labour markets and gives students the opportunity to choose their professional path from a wider range of options.

3. ECTS and Student Workload

As already mentioned in the previous paragraph, the student studies a large number of disciplines (71-74), which indicates a high workload of students.

Also, it should be noted that the block of elective disciplines has no credits. This suggests that elective subjects are not taken into account in the distribution of the student's workload. Also, some disciplines, which are taught as online courses, have 0

credits (Life Safety is located in the basic block of 7th semester; Physical training and sport are located in the basic block due to 1-2 courses), so that is also wrong. Thus, it can be concluded that the academic workload is made incorrectly in relation to students.

The number of credits, which are allocated to the core of the program, is 196. This value exceeds 50% of the total number of credits, which is provided for the educational program as a whole.

Such a distribution of credits between the "core" of the program and the disciplines of the variable and elective blocks again significantly increases the load on students.

When choosing the disciplines of the variable block, the student must study at least 11 disciplines.

On the state final examination 6 credits are given. On practice -11 credits.

During the interview with the students, it was noted that the students do not feel a high workload, they are quite satisfied with their schedule.

There must be said that the opinion of students in scheduling and distribution of workload is also taken into account by means of the student Council, which is actively involved in addressing issues and nuances related to this topic.

4. Modules/Course Units and Mobility

According to the results of the self-analysis report, students can participate in the academic mobility program throughout the entire period of study. It is worth noting that there are no "untransferable" disciplines.

During the site visit to St. Petersburg State University it was revealed that students of the Institute of Chemistry have problems with participation in the academic mobility program. During an interview with the Chairman of the student Council of the Institute of Chemistry, it was found that this is largely due to the lack of transfer systems of Russian and foreign grades. Therefore, it is recommended to create a grades correspondence table.

Also, it is worth noting that the level of academic mobility of students of the Institute of Chemistry depends on the number of students. The Institute of chemistry has a much smaller number of students compared to other faculties and institutes of St. Petersburg State University. Since the competition for participation in the academic mobility program is University-wide, the current number of students may not be

considered competitive (in quantitative terms). The University is also recommended to increase the number of foreign partner Universities included in the program of academic mobility in natural Sciences, in particular chemistry, in order to increase the activity of the program of academic mobility of students at the Institute of Chemistry. It will also contribute to strengthening the world status of SPBU as a partner University abroad.

5. Methods of Teaching and Learning

Teaching is organized in the form of mentoring in the format of interaction "head of the educational program-student" before the start of studying during the formation of the educational trajectory. If there are problems, conflicts or negative emotions associated with the development of the educational program, the student has the opportunity to report them to the head. The content of conversations the head does not disclose. Students are informed about this possibility at the first organizational meeting.

Practical classes are held in small groups of 4 -12 people. Classes devoted to problem solving and discussion of real professional tasks, in one or another volume, are implemented in all professional disciplines of the program.

St. Petersburg State University uses technological means of e-learning, network and distance learning (Blackboard). Access to educational electronic resources of St. Petersburg State University is open from any computer that has access to the Internet through a single account of St. Petersburg State University. This type of training positions St. Petersburg State University as a modern educational organization, corresponding to modern trends in education, actively using e-learning. The information and educational electronic environment "Blackboard" provides flexibility of education for students as they can study some disciplines declared in the form of electronic courses, in any place and at any time (such courses as: history of Russia, digital culture, basics of business, philosophy). It also provides communication between student and faculty and other University staff. In addition, Blackboard provides access to modern information and library resources, in particular, to world-class periodicals (Elsevier, etc.), which allows one to form a large number of skills and abilities needed when working with information, including in a foreign language. In the fourth year, students are required to select their supervisors to perform bachelor

thesis. After that, they are included in the work of the scientific group, depending on their choice.

6. Assessment procedures and performance criteria

Students pass most of the exams orally, which contributes to a better assessment of knowledge.

Depending on the volume of discipline, the number of teachers as examiners varies from 1 to 6 people, which provides an objective assessment of the student's knowledge.

When passing the exam, the student is given feedback in the form of correct answers. Written exams are mainly conducted in the form of tests, the assessment is the responsibility of the teacher. In this case, the assessment of the written answer on the exam by one person may be subjective, and therefore incorrect. It is recommended to check the written work by at least 2 members of the examination Committee.

7. Grading

According to the self-examination report, credit allocation tables under the ECTS credit system are used for both exchange program students and students studying outside exchange programs.

Credit distribution tables are presented in the transcript (a document issued on the results of training in exchange programs) and diploma Supplement for students undergoing training.

8. The Diploma Supplement

Each graduate receives the European diploma Supplement automatically.

The diploma Supplement is written in Russian and English.

9. Quality Assurance

The quality of teaching is assessed by the Quality Assurance Commission and on the basis of student surveys. The survey is organized by the student Council of the Institute of chemistry of St. Petersburg State University, held in the period from the

beginning of the session until the beginning of the new semester, then in the new semester the Student Council processes the data and publishes it on information stands and in the official VK group. Comments and assessments received during the survey are sent to the Chairman of the Educational and Methodical Commission and the Director of the Institute of Chemistry.

The inclusion of students in the campaign to assess the quality of teaching is an essential parameter, since the student is the central figure of the educational process. In this case, a very important role is played by the relationship of the teacher and the student, the degree of mutual understanding for the proper implementation of the educational process.

According to the results of surveys, quality assurance is performed through conversation with the teacher discussing a conflict situation or in recommendations to change instructional documentation, course implementation or changing the course lecturer. Also, the component "quality of teaching" is considered as a component of the premium part of the teacher's salary.

All changes in the program (introduction of new disciplines, change of curricula of disciplines, and so on) are considered at meetings of the Educational and Methodical Commission which structure includes representatives of employers, representatives of student Council, and at meetings of Council of the educational program which consists of employers. This approach allows to form the educational environment and the educational process, taking into account the wishes of employers as representatives of the modern labour market, and students as the main participants in the educational process.

Annually updated curricula and syllabi of disciplines. Updating of the syllabus of discipline is carried out also on the basis of recommendations of the Commission of quality control of educational process Of Institute of chemistry.

10. Employability

Performance of the majority of final qualifying works within the framework of external and internal grants, emphasizes the relevance of the research work carried out by graduates.

Thanks to the construction of studying, which is based on an individual educational

trajectory, graduates can realize themselves as professionals in a wide range of areas: in research activities, technological activities, pedagogical activities, organizational and managerial activities.

The graduate is prepared to improve his/her professional level by obtaining additional education, including continuing education in the magistracy. And also, the graduate is prepared to professional activity according to the qualifications received during training.

At least 90% of graduates continue their studying for getting the master's degree.

Perhaps this may be due to the preferences of representatives of today's labour market. In the course of discussions with employers, it was found that when they choose a candidate for a job position, most of them prefer graduates of the master's degree, due to the higher level of qualification. Employers also expect that bachelor's graduates are not yet fully formed individuals in professional terms, who have not yet fully formed a scientific worldview and have not chosen the field of scientific interests.

But, it should be noted that during the interview, bachelors of the final year demonstrated their high professional knowledge and relevant competencies.

11. Ethical concern

The requirement for Master thesis preparation in accordance with generally accepted ethical and legal norms is fair citation. Compliance with this requirement is reflected in the review of the supervisor on the basis of the results of the bachelor thesis check on the amount of borrowing, including meaningful identification of unauthorized borrowing.

For four years, functional groups have been successfully operating throughout the University to conduct initial analysis of dissertations and final qualifying works of students for the presence of text matches using SafeAssign – an integrated tool of the Blackboard system.

Students Also have some disciplines about ethical commitment (such as copyright protection is located in the basic block of 7th semester; academic ethics is located in the variable block of 3th semester).

To address various issues (plagiarism, citation, originality and reliable results, interpersonal relationships), the Ethics Committee was formed at the University.

12. Any other comments / information

In addition to the above topics discussed issues related to the material and technical base of the University.

During the face-to-face visit, it was revealed that the Institute of Chemistry has a large resource center with excellent modern equipment, which provides scientific research with all the necessary methods of analysis and testing. Therefore, when choosing the topics of research and graduation papers, students and members of research groups have a wide choice due to the possibility of carrying out all the necessary analyses and tests.

During the inspection of educational laboratories and lecture classes, it was concluded that it needs cosmetic repairs. This should also include aspects related to safety in the laboratory. This applies to providing students with personal protective equipment during practical work.

There have been revealed issues concerning the practical training of students at various enterprises.

In the course of interviews with graduates (bachelor's graduates who did not go on to study for a master's degree), it was found that the part of them that works in production, and not in analytical or research laboratories, experienced some difficulties at the beginning of their careers, associated with a lack of understanding of the production processes implemented in enterprises and their hardware and mechanical design.

Subjects discussed during the site visit

1. Representatives of institution's leadership

Main topics: social protection and student support; graduates' employment opportunities; career consulting, quality management.

2. Persons responsible for the programme

Main topics: Curriculum; program objectives; the learning process itself; the competency assessment system; teaching and learning methods, reviews of the staff members on their courses (methods of teaching, schedule, curricula, assessment, advanced educational methods).

3. Members of the teaching staff

Main topics: Degree profile, curriculum, items in self-evaluation report: entry qualification with engineering degree, the aim and the main tasks of the program, skills, competencies and their relation to courses, ratio of practical courses, timing and prerequisites of thesis, Russian regulations on assessment, access of students to institutional facilities, academic year, trends in last years, PR activity of the institute, employability, safety regulations for master students, transparency database.

4. Discussion with students

Main topics: educational process, level of the workload, underworking due to studying, material security and provision, organization of scientific work, relationships with supervisors and other teaching staff, conflict situations within studying and its resolutions, ability to influence program changes.

Recommendations

- To increase the level of academic mobility of students.
- To improve the condition of lecture classes and educational laboratories, including its illumination and heating.
- To increase the quantity and quality of industrial practice.
- Ensure accessibility of education for people with disabilities.
- Solve the problem with the lack of licensed software required for research
- In the last year of Bachelor's studies, increase the number of free days for a better approach to the implementation of graduate qualification work.
- Extend the working hours of the scientific center until 20 pm.