European Chemistry Thematic Network Association

Site Visit Report

For the application for the

CHEMISTRY EUROBACHELOR® LABEL

of the

Samara State Technical University

for the study programme

Energy and resource saving processes in chemical technology, petrochemistry and biotechnology

(B.Sc.)

Date of the visit:
12-13 of April, 2021

The site visit was carried out partly online on the ZOOM platform. The review was organized jointly with the Russian accreditation agency AKKORK, the Russian members of the reviewers' team were directly at the university.

Composition and Affiliation of the Site Visit Team

Irina Yefimova
Ph.D. (Economic Sciences) (Economics and Management in the Chemical Industry), Associate Professor, Rector of SILKWAY International University (Kazakhstan), Advisor to the President of SILKWAY International University (Kazakhstan) (ECTN expert).

Anna Kurbatova
Ph.D. Biological Sciences (specialty "Ecology"), Associate Professor of the Department of Environmental Monitoring and Forecasting of the Environmental Faculty of the RUDN University of Russia; International expert in the field of ecology; expert-analyst in the field of ecology at Gazprom (representative of the academic community).

Alyona Basamykina
Head of the technical department of Areal Engineering (the company is engaged in the design of treatment facilities and the development of innovative technologies in the field of wastewater treatment and waste processing) (representative of the employers' community).

Oleg Korovin
4th year student of the Bachelor's programme "Energy and resource saving processes in Chemical technology, Petrochemistry and Biotechnology" of the RUDN University of Russia (expert from the student community).

Background of the visit

History of the Institution

SamSTU is a large scientific and educational center of the Povolzhie region, which provides training for specialists for the Energy, Oil and Gas, Chemical and Petrochemical, Engineering, Transport, Food, Defense industries, Information technology, Instrument making, Automation and Control in technical systems, Materials science and Metallurgy, Biotechnology, Industrial ecology.

The university was founded in 1910. Samara provincial assembly unanimously decided to petition the government for the opening of the Polytechnic Institute in Samara. In the Samara district council, representatives of the Ufa, Orenburg provinces and the Tashkent region unanimously recognized that Samara is more suitable than other cities for the establishment of a polytechnical institute.

Mechanical, energy and chemical-technological institutes were open in Polytechnic Institute in Samara in 1930.

In 1935 Polytechnic Institute in Samara was transformed in Kuibyshev Industrial Institute named after V.V. Kuibyshev. In 1980 according to the Decree of the USSR Supreme Soviet Presidium the Kuibyshev Polytechnic Institute was awarded the Order of the Labor Red Banner. In 1992 Kuibyshev Polytechnic Institute was transformed in Samara State Technical University (SamSTU).

In 2016 SamSTU has become one of the 11 core regional universities of the Russian Federation. The new status of the University and the expansion of its communication needs have set new challenges. It was a new corporate identity of the University, which reflects the vectors of development of the Flagship University and its values.

Today the list of the main professional educational programs of SamSTU includes programs of all levels of higher education, 24 enlarged groups of training fiels. Training of highly qualified personnel in postgraduate studies is carried out in 21 directions. The university has 7 dissertation councils in 17 specialties.

Statistical data

Bachelor programme Energy and resource saving processes in chemical technology, petrochemistry and biotechnology is being implemented by the Chair of Chemical Technology and Industrial Ecology of the Institute of Oil and Gas Technology.

Total number of students at the university for the academic year 2020-2021
17 018 students

Distribution

Level	Number of students	%
bachelor students	12 368	72,6 %
students of the specialist degree	2 207	13,0 %
master students	2 067	12,2 %
postgraduate students	367	2,2 %

Structure

4 Institutes

11 Faculties
68 Chairs
5 Research and project institutes
28 Scientific and engineering centers
17 Educational buildings

Admission results:

Year	Number of students
2018	36
2019	41
2020	35

Assessment Criteria

1. Learning outcomes: Chemistry-based Practical Skills

The total credits study programme - 246 ECTS.

It should be noted that a significant part of the study program (63 credits) covers the study of Chemical technology, processes and equipment of the Chemical industry, processes and equipment of the environmental technology.

These 63 credits cover the following areas: • Analytical chemistry (4 ECTS) • Inorganic chemistry (10 ECTS) • Organic chemistry (11 ECTS) • Physical chemistry (7 ECTS) • Biological chemistry (Biotechnology - 4 ECTS) • Environmental chemistry (5 ECTS) • Physics (10 ECTS) • Mathematics (12 ECTS).

The study program provides for the practical training of students (15 credits), organized at the enterprises of the region, including: 6 credits for training practice within the framework of the project activity module (3 credits for introductory practice for 1 year of study, 3 credits for project practice in the second year of study); 3 credits for industrial technological practice in the summer period in the third year of study; 3 credits for industrial practice: research work immediately after the end of the practice, which provides for work in laboratories, as well as at specialized enterprises; 3 credits for pre-diploma practice (preparation of the GQW (Bachelor's thesis), including the experimental part).

The educational practice is implemented as part of the project activity module on one of the three project-educational tracks: Higher scientific school, Technological entrepreneurship, School of leaders, aimed at introduction to real project activities, followed by the implementation of practical research or engineering projects (at the choice of students) in interdisciplinary (if necessary) mixed-age teams. The project activity is accompanied by educational events (lectures, master classes, round tables with representatives of employers), which are planned according to the tasks of the project activities. In the third and fourth years of training, team project work continues within the framework of the discipline Practice-oriented project.

The number of credits allocated in the total amount of credits of the program for practical classes within the disciplines is 89 credits (3208 hours), of which 42 credits (1528 hours) are allocated for laboratory work. Students also acquire practical skills as part of a practice-oriented project (2 credits) and Innovative Technological Entrepreneurship Practices (3 credits).

Additionally, a laboratory workshop, practical exercises, term paper within the framework of one discipline at the choice of "Processing and utilization of industrial and domestic waste" or "Protection of subsoil and land" (3 out of 9 credits) are provided.

2. Content

The programme comprises 64 course units (compulsory and elective courses). The size of a module is between 1 credit and 9 credits (36 and 324 h). The compulsory core comprises 216 credits.

List of elective modules / disciplines usually chosen by students.

Hydrocarbons on the planet Earth - 1 credit

Chemometrics - 1 credit

Innovative Technological Entrepreneurship Practical training - 2 credits

Adaptive information and communication technologies -2 credits

English language is studied at 1 and 2 years of study (9 ECTS). Total hours – 324 and 128 of contact hours. Additionally Russian language and Communication culture (2 credits (obligatory) are studied.

12 credits are allocated for Bachelor's thesis. In accordance with the Federal State educational standard, Bachelor's thesis includes compulsory pre-diploma practice (3 credits); preparation for defense and defense (9 credits) are carried out to implement the final qualification work (Bachelor's thesis).

3. ECTS and Student Workload

The Student workload was estimated based on the requirement of 60 ECTS per year, implied by the law. This leads to approximately 36 hours (including contact hours and independent training) corresponding to 1 ECTS credit.

The Student load is 57.9 hours per week on average, including independent work and electives, of which 31-38 hours are classes (in accordance with the educational standard, the volume of contact work should be at least 60% of the total time for the implementation of disciplines / modules).

The Student workload is determined in accordance with the Federal educational standard. As part of an internal independent assessment of the quality of education, educational programs are monitored, including an annual survey of students in order to identify their satisfaction with education quality, with the structure and content of the educational program as well. Based on the results of monitoring and survey, the Head of the educational program may decide to redistribute hours for various activities within the discipline.

4. Modules/Course Units and Mobility

Academic mobility is available for 1–4-year students. At the same time, in the course of interviews with teachers and students, the facts of academic mobility were not confirmed.

5. Methods of Teaching and Learning

Training in small groups is used in laboratory work in practical disciplines, in theoretical disciplines, if this is provided for by the discipline syllabus for example, when conducting business games. Within the framework of the project module, the team project work of students is carried out. The allocation of a single day of project work in the SamSTU schedule (once every two weeks) makes it possible (if necessary) to form project teams of students of various fields of study, years and levels of study (interdisciplinary project teams).

6. Assessment procedures and performance criteria

Exams (credits) are held at the end of each semester in accordance with the curriculum.

There is no final exam in all disciplines at the end of the course. Oral and written examinations are used. In professional disciplines, oral examinations are predominantly used. Credits can be set based on the results of the student's work in the semester. In the disciplines of the general education and basic module (1 - 2 courses), it is envisaged to use an accumulative system to assess learning outcomes; when conducting exams (tests), the results of the current monitoring of progress in the semester are taken into account.

When conducting an exam, depending on the scope of the discipline and the number of students, additional 1-2 teachers may be involved as examiners.

For oral exams, the minimum preparation time is 30 minutes, the exam time, regardless of the form (oral / written), is not more than 4 hours.

When passing the exam, the student is provided with feedback in the form of correct answers.

Written exams are conducted both in the form of tests and written tests, the approval of the assessment lies in the teacher's area of responsibility.

The work program of each discipline contains a list of questions for the exam (pass/fail test), examples of tickets, information on the form of the exam (pass/fail test), the criteria for grading.

The test or exam can be conducted in face-to-face format or using distance technologies (in this case, the identification of the student's personality is provided).

Anonymous assessment is carried out in the case of taking an exam (test) in the form of automated computer testing.

Examination commissions are created for the second retake of the exam (pass/fail test), in the event of an unsatisfactory assessment based on the results of passing and the first retake of the exam (pass/fail test).

Term papers (Processes and Apparatuses of Chemical Technology, Environmental Chemistry) are evaluated according to the results of defence, for which a commission of leading teachers is created at the graduate Chair.

7. Grading

The university uses the ECTS. The point-letter system for assessing the academic achievements of students not used.

8. The Diploma Supplement

The Diploma Supplement is drawn up at the individual request of any university graduate on the letterhead of the Spanish company "Signe, S.A." In Russian and English, the application describes the level, status, content and results of the education received. In English, the document contains additional information about the holder of the diploma and his/her qualifications, as well as the content and learning outcomes in credits of the European Credit transfer and Accumulation System (ECTS).

The minimum document processing time is 10 working days. In case of a large number of requests, it can be extended up to 30 working days.

9. Quality Assurance

Internal quality assessment includes annual monitoring of educational programs (the quality of training of students and resource provision of educational activities), assessment of student satisfaction with the quality of education (educational program, organization of the educational process, conditions for extracurricular activities), assessment by students of the quality of teaching in individual disciplines. The formation of data, including the results of the survey, is carried out in the AIS "University". Specialized subdivisions generalize the results, provide them to the university administration, heads of faculties (institutes), chairs, heads of educational programs in the local information network of the university.

Based on the results of monitoring and surveys, taking into account the key areas of modernization of the educational activities of SamSTU, changes are annually introduced into the program aimed at updating the content (excluding / introducing academic disciplines or their parts), reformatting educational activities. Since 2016, while maintaining the volume of fundamental training, the practical component has been strengthened: the module of project activities has been introduced and expanded (team project work, elements of entrepreneurial education).

10. Employability

Employment of graduates:

1) 2017/2018 academic year of graduation:
   - Students working in the field of training in the region: 90%
   - Students working in the field of training outside the region: 6.7%

- Not employed in the field of training: 3.3% (the reason is the launch of one's own business, caring for a child)

2) 2018/2019 academic year of graduation:
- Students working in the field of training in the region: 94.8%
- Students working in the field of training outside the region: 2.6%
- Not employed in the field of training: 2.6% (the reason is the launch of one's own business)

3) 2019/2020 academic year of graduation:
- Students working in the field of training in the region: 94.4%
- Students working in the field of training outside the region: 0%
- Not employed in the field of training: 5.6% (the reason is the launch of one's own business)

15-20% of graduates of the study program continue their studies in the Master program "Energy and resource saving processes in Chemical technology, Oil Chemistry and Biotechnology", profile "Environment protection and rational use of natural resources" at SamSTU.

11. Ethical concern

The ethics code is regularized at university level. The code is available for the students and it is strictly taken into account. The Thesis is checked for correct referring and plagiarism. Fair citation is a requirement in Master theses implementation in accordance with generally accepted ethical and legal norms. Fulfillment of this requirement is reflected in the review of the academic advisor of the Master thesis which is based on the results of the Master thesis verification for the amount of borrowing, incl. identification of unauthorized borrowing.

In accordance with the Regulations of SamSTU on the procedure for State Final Certification, the advisor ensures that the student's FQW is submitted for verification in the "Anti-Plagiarism system.University" through the personal account of the advisor in the AIE, ensures timely transmission of the results of the examination of the thesis for the presence of borrowing to the student and upload of the thesis to the AIS. FQW checking for borrowings is carried out in accordance with the "Regulations on the use of software "Antiplagiat" for checking manuscripts and written works."

In accordance with this provision, the manuscripts of dissertations and publications are also checked.

Due to the fact that the minimum requirements for participation in the competition for taking the position of a teacher or a researcher at SamSTU includes the obligatory presence of publications in journals with a non-zero impact factor, all employees are aware of the EuCheMS code of conduct and comply with its requirements.

12. Any other comments / information

1. The Study program according to formal principles corresponds to the Standards of the European Thematic Network (engineering direction) and corresponds to the 6th level of the European Qualifications Framework.

2. The human and laboratory resources of the study program are sufficient to train sought-after specialists. An effective system of cooperation with employers has been created, they are actively involved in the development and implementation of the study program.

3. The program is characterized by a high demand for graduates, which is confirmed by a high level of employment. The initiatives of the university leadership for the development of technological entrepreneurship results in the fact that graduates start their own businesses.

4. The international component of the study program is insufficiently developed, foreign professors are not involved in lecturing, there are no examples of academic mobility of students and Teaching staff, there are no foreign students.

5. The university implements the practice of issuing the Diploma Supplement to students on request on a paid basis. The general practice of issuing free Diploma Supplements should be implemented.

6. For the more effective organization of an individual trajectory of Bachelor students training, it is advisable for the university to develop a Module Handbook describing available elective modules for the students to choose from.

7. It is necessary to expand teaching methods and forms of assessment of students, taking into account the focus on evaluating specific learning outcomes (solving cases, projects development, models development, etc.)

8. EChemTests is not used.

Persons seen

Discussion with representatives of the institution's leadership

1. *Yusupova O.V.* – Vice - Rector for Academic Affairs
2. *A.S. Zotova* – Vice - Rector for International Cooperation
3. *Kostyleva I.B.* – Counselor at the Rector's office of SamSTU
4. *Alontseva E.A.* – Head of Educational Department
5. *Smirnova S.B.* – Head of the Department for Work with Industrial Partners
6. *Malinovskaya Y.A.* – Head of Development Coordination Department
7. *Prokofieva E.Y.* – Head of the Department for Work with Foreign Students
8. *Safronov V.V.* – Dean of the Faculty of Chemistry and Technology (CTF)
9. *Nechaeva O.A.* – Director of the Institute of Oil and Gas Technologies (INGT)
10. *Novokshchenov S.G.* – Director of the Scientific and Technical Library
11. *Saushkin I.N.* – Head of Informatization and Telecommunications Department
12. *Vaskov E.N.* – Head of the Department for Educational and Social Work
13. *Gereykhanova E.E.* – Chairman of the Student Council
14. *Frank K.V.* – Chairman of the Student Union Committee
15. *Blatov V.A.*– Head of General and Inorganic Chemistry Chair
16. *Klimochkin Y.N.* – Head of Organic Chemistry Chair
17. *Krasnykh E. L.* – Head of Technology of organic and petrochemical synthesis Chair
18. *Tupitsyna O.V.* – Head of Chemical Technology and Industrial Ecology Chair
19. *Tyshchenko V.* – Head of Chemical technology of oil and gas processing Chair
20. *Mashchenko Z.E.* – Head of the Monitoring Division of the Licensing and Accreditation of Educational Programs Department.

Discussion with the administration

1. *Kostyleva I.* – Counselor at the Rector's office of SamSTU
2. *Vaskova E.* – Head of the Department for Educational and Social Work
3. *Smirnova S.* – Head of the Department for Work with Industrial Partners
4. *Malinovskaya Y.* – Head of Development Coordination Department
5. *Gereykhanova E.* – Chairman of the Student Council
6. *Frank K* – Chairman of the Student union committee
7. *Frolov E.* – Deputy Dean for educational work of the Chemical and Technological Faculty
8. *Shurygina V.A.* – Deputy Dean for educational work, Institute of Oil and Gas Technology
9. *Mashchenko Z.* **–** Head of the Monitoring Division of the Licensing and Accreditation of Educational Programs Department.

Discussion with those responsible for the programme

Olga Tupitsyna, Head of the Chair "Chemical Technology and Industrial Ecology" (representative of the Head) of the program Dmitry Bykov, SamSTU Rector).

Discussion with members of the Teaching staff and employees

1. *Tupitsyna Olga* – Head of Chemical Technology and Industrial Ecology Chair
2. *Chertes Konstantin* – Professor
3. *Churkina Anna* – Associate Professor
4. *Smirnov Boris* – Associate Professor
5. *Samarina Oksana* – Associate Professor
6. *Kopnina Alina* – Associate Professor
7. *Ermakov Vasily* – Associate professor

8. *Moschenskaya Elena* (videoconference)
9. Oksana Molotkova (videoconference)
10. *Dmitry Maidan* (videoconference)
11. *Sukhanova Irina* (videoconference)
12. *Okhtya Nikolay* (videoconference)
13. *Sizova Nina* (videoconference)
14. *Olga Kulagina* (videoconference)
15. *Dubas Elena* (videoconference)

Meeting with the students

1. *Shushanyan Gor*
2. *Dimenstein Anastasia*
3. *Kuptsova Ekaterina*
4. *Seyanko Artyom*
5. *Maltseva Alexandra*
6. *Stern Arina*
7. *Baumgertner Anastasia*
8. *Menshikova Anastasia*

Subjects discussed during the site visit

1. Representatives of institution's leadership

Yusupova O. – Vice - Rector for Academic affairs emphasised that the strategic development of the university is focused on innovative education and internationalization. Currently, a new Development Strategy 2021-2025 has been adopted and the Institute of Oil and Gas Technology will be play a key role in the modernization of the university.

Kostyleva I. – Counselor at the Rector's office of SamSTU told about the prospects for the development of the university in the system of the region, as well as the relevance and demand for educational programs in the field of Chemistry and Ecology because of the regional industries.

A. Zotova – Vice - Rector for International cooperation spoke about plans in the field of internationalization, on the attraction of foreign students, development of programs of double diploma.

Prokofieva E. – Head of the Department for Work with Foreign Students noted that her Office helps to organise international student exchange. The activities focus on students and teachers as well. In addition, the faculty supports student mobility by a local coordinator. The current focus is on incoming students.

On the question, how the university implemented the European standards and guidelines in the higher education in terms of the quality policy, Mashchenko Z. mentioned that quality assurance system is based on ISO 9001. Mashchenko Z. told about the study programs assessment, which is currently being developed and will be implemented starting from September 2021. She also noted that the university, as pilot projects, is implementing a students survey on the quality of teaching of certain disciplines. Student participation in such surveys is not very active, but the university is determined to introduce this practice.

On the question, how the university involves employers in the study process Smirnova S. - Head of the Department for Work with Industrial Partners answered that this process depends on the characteristics of each Chair and study program. Representatives of the industrial sector work with the university to develop and implement study programs.

2. Persons responsible for the programme

Smirnov Boris, Deputy Head of the Chair of Chemical Technology and Industrial Ecology.

The discussion touched upon the focus of the profile of the study program. According to Smirnov B. the study program focuses equally on Chemistry, Chemical technology and Environmental technology.

The degree program is the successor of the program developed within the framework of the Erasmus + project. The active role of representatives of the industrial sector in the development of the study program, and, accordingly, the high demand for graduates was also emphasized.

The issue of the areas of use of students' knowledge and competencies was also discussed. In experts' opinion, there are 3 areas (Chemical technology, Petrochemistry and Biotechnology), insufficient attention is paid to the study of Biological Chemistry and Biotechnology (3 credits) in the study programme.

3. Members of the Teaching staff

Teaching staff have demonstrated a strong commitment to the university. High scientific potential allows teachers staff to carry out research projects for the industrial sector. The students are involved in this research, which forms the research competencies of students. Research results are published in journals and demonstrated at conferences and seminars. At the same time, experts note the weak international contacts of teachers staff with foreign colleagues. On one side, this is a consequence of insufficient language skills of staff. On the other side, the impression was that the teachers were more focused on solving the problems of the region.

It should be noted that the low interest of staff in strong English skills affects the students who also did not express a strong interest in professional English proficiency.

Time spent for paperwork should be reduced in order to allocate more time for direct contact with students for further improvement of education quality. Efforts by the university to replace conventional paperwork by more effective electronic means is acknowledged. Unfortunately, it takes a lot of teachers' time to input the required information into the electronic system.

On the question of the absence of foreign students on the program, the teachers noted their interest in attracting foreign students, but in their opinion, this is the function of the international office.

Teaching staff confirmed their commitment to enhancing the program with new methods of analysis and monitoring based on digital processes.

4. Discussion with students

Students have demonstrated good professional competence and the ability to discuss production issues at a high level. They also confirmed their satisfaction with the quality of the program and teaching. Students are confident in their professional relevance, which is confirmed by the high employability of graduates.

The experts agree that the ambitions of the students could be more significant with the appropriate support of the teachers and the expansion of the international part of the study program. Moreover the students confirmed poor use of English literature and full-text databases.

With regard to participation in management and decision-making, students have confirmed that they are members of various commissions and councils. Student government submits student proposals for consideration. At the same time, the participation of students in the development and improvement of programs has not received direct confirmation. Members of the Chair need to find out the opinion of students, what they would like to change, organize a discussion with students, and after the proposal is drawn up, send it for approval to the leadership of the faculty.

5. Discussion with graduates

Graduates noted their satisfaction with the acquired skills and competencies. Most graduates had no difficulties in finding a job. Graduates have the opportunity to continue studies in the master programme, and some of the graduates (about 20%) study at the corresponding master's program at the Samara State Technical University.

Graduates noted the high level of organization of practical trainings and their importance for their future careers.

At the same time, graduates would like to see more study of special information programs for environmental risk assessment and environmental monitoring in the study program.

6. Discussion with employers

Employers are actively involved in the development of study programs. The University attracts representatives of the industrial sector for regular lectures and seminars.

The employers, in general, are satisfied with the level of training of specialists, and confirmed that the adaptation of young specialists requires a minimum of time.

At the same time, employers have confirmed that they require staff with advanced English skills and this demonstrates the need for advanced language training of students during their studies.