



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus kolegijos
STUDIJŲ PROGRAMOS
CHEMINĖ ANALIZĖ (653F18001)
VERTINIMO IŠVADOS

EVALUATION REPORT
OF CHEMICAL ANALYSIS (653F18001)
STUDY PROGRAMME
at Vilnius College

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Išvados parengtos anglų kalba
Report language - English

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Cheminė analizė</i>
Valstybinis kodas	653F18001
Studijų sritis	Fiziniai mokslai
Studijų kryptis	Analizinė chemija
Studijų programos rūšis	Koleginės studijos
Studijų pakopa	Pirma
Studijų forma (trukmė metais)	Nuolatinė (3)
Studijų programos apimtis kreditais	180
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Analizinės chemijos bakalauro laipsnis
Studijų programos įregistravimo data	2013-06-30

INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	Chemical Analysis
State code	653F18001
Study area	Natural sciences
Study field	Analytical Chemistry
Type of the study programme	College studies
Study cycle	First
Study mode (length in years)	Full time (3)
Volume of the study programme in credits	180
Degree and (or) professional qualifications awarded	Professional Bachelor of Analytical Chemistry
Date of registration of the study programme	June 30 th 2013

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I. INTRODUCTION

1.1. Background of the evaluation process

The evaluation of on-going study programmes is based on the **Methodology for evaluation of Higher Education study programmes**, approved by Order No 1-01-162 of 20 December 2010 of the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC).

The evaluation is intended to help higher education institutions to constantly improve their study programmes and to inform the public about the quality of studies.

The evaluation process consists of the main following stages: *1) self-evaluation and self-evaluation report prepared by Higher Education Institution (hereafter – HEI); 2) visit of the review team at the higher education institution; 3) production of the evaluation report by the review team and its publication; 4) follow-up activities.*

On the basis of external evaluation report of the study programme SKVC takes a decision to accredit study programme either for 6 years or for 3 years. If the programme evaluation is negative such a programme is not accredited.

The programme is **accredited for 6 years** if all evaluation areas are evaluated as “very good” (4 points) or “good” (3 points).

The programme is **accredited for 3 years** if none of the areas was evaluated as “unsatisfactory” (1 point) and at least one evaluation area was evaluated as “satisfactory” (2 points).

The programme is **not accredited** if at least one of evaluation areas was evaluated as "unsatisfactory" (1 point).

1.2. General

The Application documentation submitted by the HEI follows the outline recommended by the SKVC. Along with the self-evaluation report and annexes, an addendum to the SER report was provided by the HEI before the site visit presenting the most recent numbers on students' admittance and graduation, a list of final thesis themes, and additional information on employment by the area of activity of graduates in 2016 and the results of the graduate employment survey. All this data was available only much later than the time of the SER was originally submitted. No additional documents besides the abovementioned ones have been provided during and/or after the site-visit.

1.3. Background of the HEI/Faculty/Study field/ Additional information

Vilniaus Kolegija is an accredited state higher education institution of the Republic of Lithuania, which provides professional higher education, develops applied research and professional arts. Vilniaus Kolegija was established in the period of 2000-2003 by combining 9 separate specialized higher schools after the implementation of the Law on Higher Education of the Republic of Lithuania that legitimated a binary system of higher education in Lithuania. Vilniaus Kolegija is one of the largest among other professional higher education institutions of Lithuania.

There are seven faculties in Vilniaus Kolegija (Faculty of Electronics and Informatics, Faculty of Economics, Faculty of Business Management, Faculty of Health Care, Faculty of Pedagogy, the Faculty of Arts and Creative Technologies and Faculty of Agrotechnologies), and since October 1, 2015 the HEI has offered 45 study programmes in all areas of studies, with close to 6800 students and involving about 470 teachers. In all study programmes of the HEI expected learning outcomes have been formulated and the provisions of European Credit Transfer and Accumulation System have been implemented.

The *Chemical Analysis* study program is run within the Faculty of Agrotechnologies and mainly by the Department of Chemistry. The Faculty of Agrotechnologies is the main body responsible for organizing the ongoing studies, applied research activities carried out by groups of the related study fields, teaching and learning quality assurance and the Faculty activity planning process. The *Chemical Analysis* study programme has been previously accredited by Order of the Director of the Centre for Quality Assessment in Higher Education No SV6-46 “On the Procedure for the Evaluation and Accreditation of Study Programmes” on 20th of June, 2013.

1.4. The Review Team

The Review Team was completed according *Description of experts' recruitment*, approved by order No. 1-01-151 of Acting Director of the Centre for Quality Assessment in Higher Education. The Review Visit to HEI was conducted by the team on 9th of November, 2016.

- 1. Prof. Laurent Counillon (team leader)** Professor in University Nice Sophia Antipolis (France);
- 2. Dr. Domingo Cantero Moreno**, University of Cadiz, Science Faculty (Spain);
- 3. Dr. Elizabeth Margaret Briggs**, Retired Head of the School of Chemical and Life Sciences, University of Greenwich (United Kingdom);
- 4. Prof. Jan Lundell**, Professor, Head of the Department of Chemistry, University of Jyväskylä; Director of the Central Finland LUMA (STEM) Center (Finland);
- 5. Mr. Šarūnas Zigmantas**, Head of QC sector at *TEVA Pharmaceutical Industries Ltd.* (Lithuania);
- 6. Mr. Benas Balandis**, Student of Master programme in Chemistry at Lithuanian university of health and sciences (Lithuania).

II. PROGRAMME ANALYSIS

2.1. Programme aims and learning outcomes

The programme aims and learning outcomes are well defined, clear and publicly accessible. The subject learning outcomes are well connected with the programme aims following the HEI's mission to train practice-oriented professionals which fulfil the economic and social needs and wants of the Vilnius region and the whole of Lithuania. The necessity of the programme and the adaptability of the learning outcomes for the surrounding labour market and the possible further education study paths are highlighted in the SER as well in the words of stakeholders and graduates during the Review team visit at the HEI. The recent stakeholder's survey reaches the same conclusions and identifies the graduates from the programme as skilled and well-recognised in the labour market.

The programme aims and subject learning outcomes are consistent with the type and level of studies and the level of qualification offered. The learning outcomes have been classified in four areas of skill and competence development: knowledge and application of knowledge, ability to conduct tests, special skills, and social skills. These learning outcome areas reflect the needs and requests presented to the graduates when entering the labour market. These areas of skills and competences are also necessary to perform in the changing and multidisciplinary laboratory-based activities.

The main target for the programme is to educate professionals whom are application-oriented, have skills in laboratory practises, and have scientific knowledge and insights on technological aspects of practical laboratory environment tasks. As the labour market is migrating towards an increasing need of analytical chemistry specialists, technologists and technicians, and laboratory assistants, for which the current programme and its content is well prepared to answer.

2.2. Curriculum design

The objective of the study programme is based on general educational purposes and principles, Provisions for Quality Assurance in Higher Education, Descriptors of learning outcomes for the first study cycle, competences defined by the Lithuanian Qualifications Framework (level 6), Description of Chemistry Study Field and the Chemistry EuroBachelor Descriptor. The objective of the programme is consistent with the requirements of the above-mentioned documents and guarantees education that corresponds to legal acts requirements for specialist training established by the Republic of Lithuania.

The extent of the programme is 180 ECTS units which are shared between general subjects (18 ECTS), subjects in the study field including practise and specialisation subjects (153

ECTS) and optional studies (9 ECTS). The subject content of the three-year professional bachelor degree is in compliance with the Lithuanian legislative demands, and it also is in line with the European higher education standards for a three-year bachelor degree programme.

The study subjects are spread evenly thorough the whole three years of study starting from basic knowledge and skills towards specialised contents within the two specialisation areas of *Chemical testing* and *Biochemical testing*. The latter title has been changed following the recommendations of the previous assessment of the study programme. The content and methods are adequate to provide the knowledge, skills and competences needed on the labour market, and they are also adequate to support further higher-level education progress, if that is the chosen approach by the graduates after concluding the programme.

The content of the courses, experimental hands-on sessions, practises with industrial partners and in laboratory environments of collaboration partners support the achievement of learning outcomes and demands. Especially, the compulsory practises underline the connection with industrial environment, and provide valuable insight on laboratory experiences in real life surroundings. Various study methods are applied to achieve the subject learning outcomes. They are chosen in accordance with the intended learning outcomes, the form of activities (lectures, workshops, practical classes, etc.), themes of the study subjects, and level of the result taxonomy (knowledge, comprehension, application, analysis, synthesis and evaluation). Most of them involve students as active learners.

The development of the curriculum involve feedback from the stakeholders and the alumni, and there is a clear top-to-bottom view on the practises and possibilities of curriculum development, as evidenced by the interviews between the Review Team and various staff and stakeholder representatives.

The content of the programme does reflect the latest achievements and technologies in the field of laboratory-based testing. However, since the area of education is highly affected by developments and technological advances as well as legislative changes, there is a need for constant reflection of curriculum contents and learning outcomes. For example, based on the interviews, the European level legislative actions like REACH and CLP in chemical safety should be incorporated in the curriculum in order to give the students an overview on European level actions together with Lithuanian ones. Nevertheless, the Review Team welcomes the role of health and safety issues in the beginning of the study programme, which is essential in training laboratory specialists.

During the site visit the students and alumni brought forward comments of including more genetics and biochemistry into the curriculum, especially in the *Biochemical testing*

specialisation. These comments could reflect the changing demands in biochemical analytics in the industry and official reference laboratories, and as such they should be reflected upon as possible ways to develop future working skills.

2.3. Teaching staff

The Faculty staff consists of academic staff, administration and other employees needed for carrying out activities of the Faculty. A majority of teachers (71 %), working in the study programme, work full time, others (29 %) are people invited from the social partners' and other institutions. Some of the teachers are in parallel engaged in the occupational world and this enables the integration of innovation into the study process and helps ensure the applicability of theoretical knowledge in practice. The subjects of the *Biochemical testing* specialisation are taught by JSC Thermo Fisher Scientific Baltics employees and Vilniaus Kolegija teachers who carry out the training in a real working environment.

The Faculty academic staff meets the general requirements for the first cycle study programme set out in Order No V – 501 of the Minister of Education and Science of the Republic of Lithuania “On the General Requirements for Degree Awarding First Cycle and Integrated Study Programmes” of 10 April 2010 (Official Gazette, 2010, No 44-2139; 2010, No 88-4676; 2011, No 9399; 2012, No 21-977, 24 November 2014, No 2014-17874).

All teachers working in the study programme hold at least a Master degree or a corresponding qualification of higher education and have three or more years of practical experience in the subject they teach. Altogether 18 teachers are involved in the Chemical analysis study programme; 4 of them are employed at the associate professor level and 14 of them are lecturers. The average teaching experience of permanent teachers is 19 years. Based on the SER and the interviews, the Unit has a clear strategic approach how to manage the staff turnover in the upcoming years.

Teachers' pedagogical experience reflects the long-standing practise to communicate, to collaborate with students and colleagues, to combine the needs of students with the study programme and subject learning outcomes, to apply flexible study methods for students of different abilities, to choose the appropriate subject-related information, and to prepare learning material. Therefore, the involved teaching staff is very adequate to ensure learning outcomes, the success of the study programme, and constant personal-like support to the students in their studies. The latter was demonstrated in the interviews by the staff and students alike describing the study community as a “cosy family environment”.

The huge teaching loads between 680 and 760 academic hours within the programme create a challenge to staff professional development, as well as efficient curriculum

development. According to the SER, teacher competence development is a continuous process and teacher professional development (courses, internships, conferences, projects, etc.) is planned and coordinated by the department and for each teacher according to individual needs. In 2014 a teacher professional development plan for 2014-2018 was prepared, and the Faculty administration encourages and supports qualification improvement. This, however, is mostly based on the interests of the teachers. Consequently, there should be a stepped-up Faculty level drive towards pedagogical training of teachers (especially in the field of ICT and virtual teaching technologies) and teaching in English. The latter is especially important since the SER identifies a 30 ECTS study programme in English, which is intended to attract foreign students. The HEI should make sure that the teacher qualifications match the offered foreign-language courses. Moreover, such skills and active involvement of language training would benefit also the students during their studies and make the offered study programme more diverse with respect to surrounding labour market. Also, enhanced teacher mobility to and from foreign companies and higher education institutions would support “home-internationalisation” of the Faculty.

The current professional development of teachers could benefit from a continuous working life-related practise within the industry or other higher education institutions similar to that offered to the students within the study programme. This would make the teachers more pre-reactive to the changing analytical methodology and method development in the labour market, in industry and in technology-offering companies, as well as in academic research. The statement made in the previous evaluation (the SKVC certificate No SV2-137 “On the Accreditation of Study Programmes” of 18 June 2013 and the Extract from the Expert evaluation findings No SV4-189, Paragraph 3.3.) “More actively participate in research and increase the number of doctoral degree holding teachers programme teachers engaged in scientific research” is still eligible to provide added value to the study programme and its realisation.

2.4. Facilities and learning resources

There are seven faculties in Vilniaus Kolegija. Material facilities and premises can be used by students and teachers of all faculties, although study programmes are assigned to separate faculties. Material facilities play a great role in the implementation of *Chemical analysis* study programme. They are concentrated in the Faculty auditoriums, classrooms and laboratories equipped with learning tools, inventory and chemistry laboratory equipment necessary for lectures and student practical training. Social partners of the study programme provide access to their corporate material base for practical classes, professional practice and educational tours, as well as enable teacher professional internships. Therefore, basic needs for laboratory-based practises and training is available for the students of the programme. Nevertheless, as there are

plans to increase the number of students in the study programme it becomes a logistic planning issue to enable all students to access the same laboratory infrastructure as is now employed.

To carry out specialisation and final practice in real conditions, permanent contracts have been signed with national companies and other institutions and laboratories which have modern technological base or the latest chemistry laboratory equipment and available places for students' practice, and which are permitted to carry out chemical testing of the surface and underground water, sewage, air and stationary sources of air pollution emissions. In general, premises and infrastructure for studies are adequate both in size and quality.

The library at Vilniaus Kolegija consists of central library and seven faculty libraries. They provide students with all the books they need in their studies, so students can easily borrow them. Students have an access to various electronic databases where they can access scientific articles. There is also access to Lithuanian national electronic libraries, which extend the resources provided by Vilniaus Kolegija. On the other hand, the Review Team noted that the subject-specific literature in English language are basically restricted to University level textbooks whereas a broader and handbook-type literature would support the scientific development of the students in a more general sense. Such resources could also be incorporated as part of the group work, self-study and practical exercise activities. This would support the "home internationalisation" as well.

Based on the interviews with students and social partners, there is a lack of laboratory equipment besides the most common and basic equipment. Nevertheless, the quantity and quality of equipment in the laboratories are sufficient compared to the financial situation of the HEI and the practical realisation of the study programme. It was brought to the attention to the Review Team that there would be opportunities for the Faculty to obtain new analytical equipment from the social partners but that there are scarce financial opportunities to maintain such equipment in the student laboratories. Such opportunities need to be carefully considered whether these opportunities could be realised by some means, as novel equipment could also provide new opportunities for teacher and student-led research projects. The acquiring of high-performance equipment must also be reviewed in the light of collaborative tasks and projects with the social partners and in the benefit of the students' practice possibilities.

As there is a high importance of safety and health issues in the laboratory-based education and practise, there is a need to enforce the best practices also during the studies. The Review Team made a positive note of the practises observed during the visits to student laboratories. Nevertheless, the use of warning and information signs and markings should be

more prevalent. Also, the availability of emergency showers is quite scarce based on the age of the building occupied by the Department of Chemistry.

2.5. Study process and students' performance assessment

The common admission to the first cycle studies is organised and carried out, as well as the best secondary education graduates' succession is formed by the Lithuanian Higher Institutions Association for Organizing Joint Admission (LAMA BPO) in accordance with a mandate (TAR, 2014, No 17876) granted by Order of the Minister of Education and Science No V-1105 of 24 November 2014. The HEI has participated in the joint admission to higher education institutions (LAMA BPO) since 2005. The joint admission includes the main and additional admission. Student admission rules determine the general principles and procedures for persons, with at least secondary education, admission to the state-funded, self-funded, and self-funded with scholarship student places. The main criterion for admission is competition score. Calculating a competition score for physical sciences study field, which is used to draw the competition queue, the main weighting coefficient (0.4) is a maturity examination grade in Chemistry; Mathematics, Lithuanian Language and Literature maturity exam grades, as well as selectively Foreign Language/History/Physics/Information Technology/Biology examination or annual assessment weightings are 0.2. The weighting coefficients are in accordance with the coefficients set for the Chemistry field study programme. Additional points are given to international and national Olympiads I-III place winners. Therefore, the admission requirements are well-founded and clear.

The study process at Vilniaus Kolegija is regulated by study documents that are submitted on the HEI website: <https://www.viko.lt/studijos/studiju-dokumentai/>. The study process schedule is concluded in accordance with the Academic Calendar for the academic year, approved by the Academic Council, and in compliance with the *Chemical analysis* study plan. The schedule indicates the time and duration of the theoretical teaching, practice, exam sessions, vacations, and preparation of the final thesis. The study process schedule is approved by the Dean, and is publicly available in the Faculty and on the Faculty website <http://atf.viko.lt/lt/page/Studijuproceso-grafikas>. The regular volume of one study year is 60 ECTS. The *Chemical analysis* study programme allocates 15 % of the programme scope for lectures, 30 % for practical classes, 8 % for consultation, 3 % for assessment, 44 % for self-study. The organisation of the study process is well balanced to ensure the provision of the programme and the achievement of the learning outcomes.

The SER indicates innovative methods are integrated into studies in order to stimulate students' critical thinking and constructive learning. On the other hand, very scarce evidence is available from SER and from interviews with different target groups that assessment methods are developed in a consistent way to support the use of innovative learning methods, and how this is supported by in-house teacher development. Moreover, the use of ICT and virtual learning possibilities to engage different learners is not used in a systematic way. The study programme makes an impressive impact of planned, organised and realised formal educational programme, but since 44 % of the allocated study time is based on self-studying, more active guidance of the informal study processes could be sheltered.

The students interviewed felt very happy and satisfied about their studies and study programme. They are very motivated and target-oriented. They were especially highlighting the possibility of research work and practices at the student laboratories or in the Thermo Fisher Scientific company. Since the study programme aims for mid-level education needed by the industry, it could be advisable to increase practical exercises and hands-on training to support laboratory skills and competences valued by the industry. Also, the possibility of pursuing their final theses in industrial setting was regarded as a valuable aspect of the programme. It must be noted here that there is a good consistency in assessment practices of final theses, which is demonstrated by evaluation form and statements. The evaluation teams also contain members of social partners, which provide a good communication and information channel between the HEI and the social partners.

The international mobility within the study programme is quite low. One of the issues here is the small amount of agreements with European universities (only 3 agreements). The mobility possibilities should be enhanced especially since the students interviewed testify about the usefulness and motivational aspect of the exchange. Moreover, a more elaborate exchange programme could attract foreign students to the HEI, which should have also a positive impact on the language skills of students and teachers alike.

The assessment practices of students' performance are clear from the beginning of the courses. After the assessments, teachers hold discussions about the tests or colloquiums in order to give feedback on student achievements. Also, course development practices involve feedback to the students on how their earlier feedback have been taken into account. The latter is based on surveys where students can express their opinion and suggestions about courses and teachers. The clear and outspoken feedback practises enhance the good relationship between staff, teachers and students.

2.6. Programme management

Since 2013 the Vilniaus Kolegija has implemented the EU project “Quality Management System Development at VK” (No VP1-2.1.-ŠMM-04-K-02-023), which is aimed at improvement of the internal studies quality management system (ISQMS) model by supplementing it with EFQM (European Foundation for Quality Management) principles: policy and strategy, the impact on the public and process. During the project the ISQMS key documents - Quality Manual, Descriptions of procedures and the ISQMS integrated information system model have been developed <http://www.viko.lt/kolegija/kokybes-uztikrinimas/kokybes-dokumentai/>. Vilniaus Kolegija as a higher education institution is responsible for the internal quality assurance system, its development, implementation and continuous improvement, because the HEI is accountable to students, academic staff, other stakeholders, the public and the state. The Vilniaus Kolegija internal quality assurance system is focused on the implementation of its mission, strategic goals and objectives.

The quality of the Chemical Analysis study programme is assessed in accordance with the Internal Study Programme Quality Assessment Procedure, approved by Order of the Academic Council No ATN-7 of 5 June 2013. The document lays down procedures for the evaluation of the quality of programmes which are intended to be carried out, and quality assessment and renewal procedures for already implemented study programmes. The activity of the Study Programme Committee is coordinated by the Chairman of the Committee. He plans and organises the activities of the Committee members; carries out the maintenance of material facilities, learning resources, staff recruitment and its professional development; ensures the assessment quality of students' final theses; organises students, graduates, employers and stakeholders' surveys on study quality assurance; analyses experience of similar study programmes abroad; carries out dissemination of innovations; cooperates with social partners on specialist training and development issues.

The Chemistry Department carries out surveys to gain information for quality assurance: “Teaching quality”, “The quality of the final thesis supervisors' consultation”, “Opinion of the Final Thesis Qualification Committee about the final thesis preparation and defence quality”, “Students about projects”, “Organisation of student self-study”, etc. Survey results are available on the Faculty website: <http://atf.viko.lt/lt/page/Chemine-analize>. This data is constantly used to improve the study programme activities and practices. It is however, less evident that the same data is used on the management level to affect the strategic planning and personnel development plans. Based on the interviews and the SER this takes place on a less formal level but the Faculty

could develop such practices as a standard management tool for strategic and strategy implication plan.

On the other hand, the data collected in surveys is used on a course level in a very efficient way to improve and develop the course content, teaching methods and learning outcome monitoring. As a strategic management approach the Faculty could adapt a way in which the good practices at the single course level would be extended to a more collaborative strategic bottom-to-top development tool. This could be a very effective approach in a unit where almost 30 % of the teaching staff is part-time teachers from other academic institutions or social partners.

All in all, the current quality assurance practises ensure a clear connection between strategic planning, study programme and personnel management and learning outcome monitoring for development purposes. One clear evidence of this is the fact, that was commented upon management and teacher interviews, that the Faculty is able to accommodate twice the number of students than what is the current intake, and the infrastructure and teaching resources could cope with the increase.

The strategic planning and reactive programme management have created a well-established interaction and shared responsibility scheme between the Department of Chemistry and the industry, especially Thermo Fisher Scientific. The collaboration does benefit the training programme and provides a very efficient way to introduce the students into practices and methods used in the industry. At the same time this raises questions of risk management since the collaboration is heavily dependent on ONE industrial collaborator. In the upcoming years the management of the study programme should take active stand on broadening the collaborative actions with the industry to ensure the future diversity of educated laboratory specialists.

The Review Team acknowledges the Vilniaus Kolegija, the Faculty of Agrotechnologies and the Department of Chemistry for a very well managed study programme, which provides a profound strategic vision and action plan of study programme development with respect to the needs and requirements of industry and employment of graduates. This was also evidenced by the stakeholders and social partners in the interviews giving credit to motivated and well-trained laboratory specialists. Moreover, the ownership of the SER among the staff, teachers and students in the unit was an impressive demonstration of mutual commitment and collaboration within the educational unit. However, the good practices in programme management and survey reactivity need to involve full-time and part-time teachers alike even more in the future, especially in support of the general subjects within the study programme.

2.7. Examples of excellence *

* if there are any to be shared as a good practice

The connection between curriculum design, strategic vision at the Faculty and Department levels and program management forms a combination ensuring a very effective educational development and teacher skill and competency development action plan with respect to industrial and employability needs.

Consistency in assessment practices demonstrated by use of evaluation forms and grading guidelines and statements. Course development practices involve feedback to the students on how their earlier feedback have been taken into account. This is based on surveys where students can express their opinion and suggestions about courses and teachers.

Stakeholder and social partner interaction within the programme in the form of participation in Thesis evaluation teams, as well as integrating social partners via shared laboratory infrastructure and training practices. The students of *Chemical analysis* have an opportunity to do research and do their final theses at Thermo Fisher Scientific. The students have some laboratory work there too. This means that they can use and get familiar with the newest technology at the company.

III. RECOMMENDATIONS

1. The study programme needs to take more active strategic stand on internationalisation, especially “home-internationalisation”, to attract foreign collaborators and students, as well as to provide the students and the staff possibilities to work in international setting and practice locations. This requires the Faculty to be proactive in developing English language skills and actively seek and realise mobility opportunities. This will support the future needs of students and staff to adapt into global labour and science markets.
2. The Faculty and the Department of Chemistry need to update the strategic insight on *Biochemical testing* specialisation with respect to the changes in society and industry.
3. The Faculty and the Department of Chemistry need to develop proactive ways to implement formative and constant assessment methods of skills and competencies with the increasing use of innovative teaching methods. The possibilities of ICT and virtual learning platforms should be investigated in order to support meaningful informal training. Further development of continuous and program-related teacher training models is needed to support the implementation of innovative teaching and assessment methods, and second-language educational activities.
4. The use of student and stakeholder surveys need to be upgraded to be also used as a strategic planning tool and in support of developing the quality assurance system.
5. The study facilities need to be updated according to industrial counterparts and health and security requirements as much as is financially viable. Hands-on practices are to be increased to the maximum extent of facilities, teacher resources and social partner collaboration.
6. Teachers should be more actively participating in research and the faculty could benefit from increasing the number of doctoral degree holding teachers engaged in scientific research. The current professional development of teachers could benefit from a continuous working life-related practise within the industry or other higher education institutions similar to that offered to the students within the study programme.

IV. SUMMARY

The Review Team acknowledges the positive impression and culture of action at the Vilnius Kolegija, the Faculty of Agrotechnologies and the Department of Chemistry. The Team was impressed on a very well managed study programme, which provides a profound strategic vision and action plan of study programme development with respect to the needs and requirements of industry and employment of graduates. The atmosphere at the Department of Chemistry was very enthusiastic overall, and the interviews provided positive and very informative discussions. Moreover, the ownership of the SER at the Department was notable and the quality management system was well established within the Unit.

The main target for the programme is to educate professionals whom are application-oriented, have skills in laboratory practises, and have scientific knowledge and insights on technological aspects of practical laboratory environment tasks. As the labour market is migrating towards an increasing need of analytical chemistry specialists, technologists and technicians, and laboratory assistants, for which the current programme and its content is well prepared to answer.

The programme aims and learning outcomes are well defined. The content of the courses, experimental hands-on sessions, practises with industrial partners and in laboratory environments of collaboration partners support the achievement of learning outcomes and demands. Especially, the compulsory practises underline the connection with industrial environment, and provide valuable insight on laboratory experiences in real life surroundings. The development of the curriculum involve feedback from the stakeholders and the alumni, and there is a clear top-to-bottom view on the practises and possibilities of curriculum development. The content of the programme does reflect the latest achievements and technologies in the field of laboratory-based testing. However, since the area of education is highly affected by developments and technological advances as well as legislative changes, there is a need for constant reflection of curriculum contents and learning outcomes.

The involved teaching staff is very adequate to ensure learning outcomes, the success of the study programme, and constant personal-like support to the students in their studies. On the other hand, there is a need for long-term strategy for teacher skill and capability development, especially in the areas of education in English language and incorporating research activities into the curriculum and for development of research-based teaching activities.

The study programme relies heavily on the possibility of research work and practices at the student laboratories or in social partner laboratories like the Thermo Fisher Scientific

company. Since the study programme aims for mid-level education needed by the industry, it is noted to be advisable to increase practical exercises and hands-on training to support laboratory skills and competences valued by the industry. Also, the possibility of pursuing final theses projects in industrial setting is regarded as a valuable aspect of the programme.

The strategic planning and reactive programme management have created a well-established interaction and shared responsibility scheme between the Department of Chemistry and the industry, especially Thermo Fisher Scientific. The collaboration does benefit the training programme and provides a very efficient way to introduce the students into practices and methods used in the industry.

The current quality assurance practises at the Faculty and the Department of Chemistry ensure a clear connection between strategic planning, study programme and personnel management and learning outcome monitoring for development purposes. The feedback surveys are constantly used to improve the study programme activities and practices. However, there is still space for the same data to be used on the management level to affect the strategic planning and personnel development plans. The outcome is a study programme valued by the students, by the stakeholders and the social partners being a programme which lead to employment and well qualified laboratory specialists needed on the labour market.

V. GENERAL ASSESSMENT

The study programme *Chemical Analysis* (state code – 653F18001) at Vilnius College is given **positive** evaluation.

Study programme assessment in points by evaluation areas.

No.	Evaluation Area	Evaluation of an area in points*
1.	Programme aims and learning outcomes	4
2.	Curriculum design	4
3.	Teaching staff	3
4.	Facilities and learning resources	3
5.	Study process and students' performance assessment	3
6.	Programme management	4
	Total:	21

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupės vadovas:

Team leader:

Prof. Laurent Counillon (team leader)

Grupės nariai:

Team members:

Dr. Domingo Cantero Moreno

Dr. Elizabeth Margaret Briggs

Prof. Jan Lundell

Dr. Šarūnas Zigmantas

Mr. Benas Balandis