



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus universiteto

**STUDIJŲ PROGRAMOS *BIOCHEMIJA* (612C73001)**

**VERTINIMO IŠVADOS**

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**EVALUATION REPORT  
OF *BIOCHEMISTRY* (612C73001)  
STUDY PROGRAMME  
at Vilnius University**

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Išvados parengtos anglų kalba  
Report language - English

Vilnius  
2014

## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Biochemija</i>
Valstybinis kodas	612C73001
Studijų sritis	Biomedicinos mokslai
Studijų kryptis	Molekulinė biologija, biofizika ir biochemija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Biochemijos bakalauras
Studijų programos įregistravimo data	1997-05-19

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## INFORMATION ON EVALUATED STUDY PROGRAMME

Title of the study programme	<i>Biochemistry</i>
State code	612C73001
Study area	Biomedical Sciences
Study field	Molecular biology, biophysics and biochemistry
Type of the study programme	University studies
Study cycle	first
Study mode (length in years)	Full time (4)
Volume of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Biochemistry
Date of registration of the study programme	19-05-1997

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## I. INTRODUCTION

### 1.1. *Background of the evaluation process*

The evaluation of the first cycle study programme “Biochemistry” 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, the following additional documents have been provided by the HEI before, during and/or after the site-visit:

No.	Name of the document
1.	Amendment of the study plan on the first cycle programme “Biochemistry”.
2.	Lists of participants of target-group meetings during the site visit.

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

Vilnius University is the biggest university of Lithuania with 23 core academic divisions including 12 Faculties, 2 Institutes with faculty, 5 research institutes, and 4 inter-faculty Study and research centres. In 2013, there were 3761 employees working at the University, of which 1387 represented the teaching staff and 480 researchers (1670 academic degree holders in total). First cycle Biochemistry study programme is delivered in close cooperation between Faculty of Chemistry (FCH) and Faculty of Natural Sciences (FNS). Biochemistry study programme was initiated in 1961. Since 1997 the programme has been split into two cycles (Bachelor degree and Master degree). Both Biochemistry study programmes are administrated by the Faculty of Chemistry. Last time the first cycle Biochemistry study programme passed external evaluation in 2008. Evaluation was done by Lithuanian Centre for Quality Assessment in Higher Education. The programme was evaluated positively without any conditions.

### **1.4. The Review Team**

The review team was completed according *Description of experts' recruitment*, approved by order No 1-55 of 19 March 2007 of the Director of the Centre for Quality Assessment in Higher Education, as amended on 11 November 2011. The team conducted the Review Visit to The Vilnius University on Tuesday 16th September 2014.

1. **Prof. Kari Keinänen (team leader)**, Department of Biosciences, University of Helsinki, Helsinki, Finland.
2. **Prof. Helmut Grubmüller**, Department of Theoretical and Computational Biophysics, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany.
3. **Doc. Bruno Cardinaud**, INSERM U1035, University of Bordeaux Segalen, Bordeaux, France.
4. **Prof. Laima Ivanovienė**, Department of Biochemistry, Lithuanian University of Health Sciences, Kaunas, Lithuania.
5. **Mr. Benas Gabrielis Urbonavičius**, Ph.D. student of Kaunas University of Technology,

## **II. PROGRAMME ANALYSIS**

### **2.1. Programme aims and learning outcomes**

BA programme in biochemistry is a four-year (8 semesters) study programme encompassing a total of 240 credits. The aims and expected learning outcomes of the programme (Self-evaluation report, SER, pp.7-8) are appropriate for a Bachelor-level biochemical education and

comparable to corresponding programmes internationally. The aims are divided in four areas, broadly focusing on biochemical knowledge, practical laboratory skills, critical analytical thinking, and communication skills. Learning outcomes from each of these areas are described in the form of competencies obtained or expected. The aims and learning outcomes are written in a clear and understandable manner. The information of the general aims and learning outcomes is posted in the internet, and is made available to the general public through open doors and other events. In the meeting with the students of the programme, it became clear that the web information on the courses and their learning outcomes and assessment procedures is not always as clear or up-to-date as it should be, and accordingly, should still be improved.

The programme responds to the increasing demand of highly qualified biochemists by Lithuanian biotechnology and healthcare sectors. Based on discussions with graduates and employers during the site visit, the employment prospects for biochemists are presently good, and due to the predicted growth of the biotechnology area (SER, p.9) they are likely to remain favourable in the near future. The expert panel was impressed by the level of enthusiasm and commitment expressed by the staff and students, and by the high degree of satisfaction of the graduates and their employers to the education and the skills obtained. These are all signs of a successful programme and indicate that the assigned aims and learning outcomes of the programmes are reached. Opinions of the students and teachers and the views of social partners and employers the panel met during the site visit all speak for a respected status of the programme. This will naturally help to continuously attract highly talented and motivated students to the programme.

In summary, the objectives and learning outcomes are appropriate for bachelor-level qualification in the study field, consistent with the needs of the labour market, and achievable during the course of the programme. The study programme name, its learning outcomes, content and the qualification offered are compatible with each other.

## ***2.2. Curriculum design***

The curriculum and the volume of the programme and its various components are all in compliance with the legal requirements for Bachelor-level study programmes. The study subjects and courses are distributed evenly between the eight semesters (30 credits per semester). In the first few semesters, the essential supportive subjects, physics and mathematics and English language are taught and the volume allocated for these topics appears sufficient for the purpose. A key question in the design of biochemistry curricula is how much effort should be put on building a sound physical and chemical knowledge basis and how much on the study of diverse

biological systems and questions. Judged from the information in SER and the discussions the review team had with the staff and students, chemistry features prominently in this programme, which distinguishes it from similar programmes and was clearly appreciated by the employers the review team met during the site visit.

The scope and content of the courses appear sound and should facilitate achievement of the learning outcomes. The courses are ordered in a logical fashion to facilitate progress of students to more advanced courses with adequate background knowledge. Based on course descriptions, there may be overlap between some courses (e.g. between Bioorganic Chemistry and Biochemistry I) but this is not extensive and may be even unavoidable. It is unclear if the rather traditional and broad course on General Biology is able to provide sufficient information on some important fields like plant biology (relevant for applications in "green" biotechnology) and evolutionary biology (which gives a logical framework for thinking many biochemical problems). The review team learned that there are plans to incorporate more plant biology into the curriculum, and the team gives it strong support to this. A new course in molecular biology, transferred from MA programme, will start in 2015, and makes a most welcome addition to the programme. Courses of biostatistics and bioinformatics are important for all bioscientists and are properly included in the present curriculum. A variety of teaching methods are employed: the courses often contain lectures, seminars, and laboratory practicals.

The courses Practice I and II (tot. 20 credits) and Bachelor's Thesis (15 credits) familiarize the students with experimental science, scientific reporting and literature. The topics of BA Theses represent biochemical and molecular biological research, and are generally of a quite advanced level with little difference, at title level, to Master's Theses. The supervisors are mostly from VU departments and institutes. The panel was delighted to see that quite a few Bachelor's Theses have been done also in biotech companies and some abroad. Almost all theses are written in Lithuanian, but include an English summary. The selection of final theses that was made available to the review team showed that the theses are generally of high quality, consistent with the high grades awarded at the thesis defence.

Some aspects of the curriculum may need consideration in the future development. Bioethics and research ethics are presently not covered in any coherent fashion. Ethical dimensions of biotechnology and sound knowledge of good scientific practise in the conduction of research and in scientific publishing are important components of scientific training and can be incorporated in more structured way into the curriculum. The review team notices that the volume of elective studies is quite low, 19 credits (8%). Although not necessarily a problem, some more flexibility

in the programme could further promote student motivation and generate diversity beneficial in the job market.

In general, the curriculum is well-planned and solid. The courses cover the essential fields and provide up-to-date information. Apart from the emphasis on chemistry, a clear asset of the programme, no strong biases are apparent, consistent with Biochemistry BA serving as a platform to MA studies on many different fields and, potentially, to jobs in industry and elsewhere.

### ***2.3. Teaching staff***

The academic staff involved in the programme is composed of 40 teachers of whom 33 (82 %) have a doctoral degree and seven have a Master's level degree (SER Appendix 2). The teaching staff has on average 13 years of pedagogical experience and 20 years of experience in scientific research (SER Appendices 2 and 3). This is in compliance with National legal acts. The number of teachers allocated to the programme seems adequate: with a staff of 40 and a student admission of 32-45 students/year (SER p.23, table 9) to a four-year programme, the teacher/student ratio is sufficient.

Biochemistry study programme integrates study courses from biochemistry, mathematics, physics, chemistry and biology study areas. Teaching is provided by qualified academic staff, including 12 professors and 11 associate professors, with expertise in the respective study fields as indicated by training and scientific publications presented in CVs (SER, Appendix 3). Many teachers of biochemistry, chemistry and other courses have authored textbooks and other relevant teaching material. Overall, the academic merits and research activities of the teaching staff are adequate to ensure high-quality teaching and achievement of the learning outcomes of the study programme.

Average age of teaching staff is 46 years, and the age structure shows a wide distribution with 40 % of the staff being under 40 years and 15 % over 60 years (SER p.17, table 7). These figures are indicative of a healthy turnover which ensures an adequate provision of the programme. Vilnius University selects academic and research staff by public competition and signs five-year employment contracts. The selection criteria stress achievements in scientific research and publication in journals with impact factors. Vilnius University supports comprehensive development of the teaching staff and organizes an Introductory training programme for the new staff. The relatively low salaries of the professors and other teachers pose, however, problems for the recruitment and often make it necessary for the teachers to have additional teaching hours in other Universities or Institutions.



Workload of teaching staff consists of c. 250 contact hours per year (SER, p.17) and of the necessary preparative and consultative work. While this represents a considerable amount of work, it does still leave room for active engagement in scientific research as 26 teachers are participants or leaders of various projects (SER, Appendix 4). Such research activity is important for keeping up with the current trends in biochemistry and for conveying the latest scientific information to the students. Members of the teaching staff also serve in editorial boards, international scientific societies, and as experts in international programmes. The level of international mobility of the academic staff is high and the staff appears generally satisfied with their possibilities to travel and make research visits to foreign Universities. Most have good links to foreign collaborative partners which is also important for student exchange.

Overall, the academic staff of the programme is highly qualified, active in scientific research, and deliver study courses of the field of their own expertise, all factors which help support maintenance and continuous development of modern biochemical education.

#### ***2.4. Facilities and learning resources***

The study programme in Biochemistry uses facilities and learning resources of several core units of Vilnius University – facilities of four faculties (Faculty of Natural Sciences, Faculty of Chemistry, Faculty of Physics, and Faculty of Mathematics and Informatics) and research institutes (Institute of Biochemistry, Institute of Biotechnology). Recently, most auditoria and laboratories in the Faculty of Natural Sciences have been renovated, and meet the requirements of modern teaching. Their capacities are generally sufficient for lectures and student practicals, although with some small laboratories (e.g., Cell Biochemistry lab, 5 student places), there may be occasional scheduling problems which need attention. The auditoria, teaching laboratories and computer classes belonging to other Faculties (Chemistry, Physics, Mathematics and Informatics) likewise meet the size and quality requirements of teaching.

The Faculty of Natural Sciences has recently invested 2.9 million EUR in research and teaching equipment, of which 1 million EUR has been used in the Department of Biochemistry and Molecular Biology (SER p.19). In addition, student practical training and bachelor research projects are organized also in the Institute of Biochemistry and Institute of Biotechnology. These institutes have likewise renewed their research infrastructure recently, now including top-quality facilities for crystallography and X-ray analysis, mass spectrometry, next-generation sequencing platforms, real-time PCR, high throughput robotic systems, atomic-force microscope, laser scanning microscope, etc. (SER p.19). As a result of this remarkable modernization, the Faculties and Institutes involved in the programme can provide a very good infrastructure for the

laboratory teaching. There are also sufficient laboratory consumables for the research practise of the students due to a number of well-funded research projects in the Departments and Institutes involved in the programme.

Computer facilities to support teaching and learning are sufficient. In the Faculty of Natural Sciences, the students have access to three computer classes, which are used for training and for examination. Students can also use computer classes in Digital Science and Computing Center of the Faculty of Mathematics and Informatics, where the practical course of Bioinformatics is organized. In addition, the Center for Electronic studies and Examination provides computer classes for examination of the programme students. In the faculties, the students have wireless internet access.

The VU offers a wide range of practical placements to the students. Most students find their practical placement by themselves at the core units of VU, including the Department of Biochemistry and Molecular Biology, the Institutes of Biochemistry and Biotechnology, and the hospital, and in biotechnology companies like Thermo Fisher Scientific, Biotechpharma and Nomads. The practical placements are appropriate for achievement of practical skills in biochemical investigation.

VU Central Library has subdivisions in each faculty and research institute with collections relevant for their study programmes and research profiles. The availability of textbooks required for Biochemistry study programme meets the needs of the students (SER, p.21 Table 8). Well-known international biochemistry textbooks (in English) are used, and the majority of them are new. With some, the number of copies is low, but the students were not concerned about that. A large amount of relevant electronic teaching material in Lithuanian has been prepared by the teaching staff and can be accessed through in the University website. After the opening of the National Open Access Scholarly Communication and Information Center, the students have gained full access to the Library resources (books, journals, databases) from any computer connected to the University network. This facilitates also the use of e-books.

Overall, the facilities for teaching and learning are research laboratories are of adequate quality and sufficient for successful implementation of the programme.

## ***2. 5. Study process and students' performance assessment***

Admission of students to the programme is competitive and based on grades in secondary school maturity exam and annual scores. Grades in chemistry, biology, mathematics and Lithuanian are currently included in the calculation of the competitive score. According to rules of Vilnius University, only applicants with a competitive score of 50% or more of the maximum

will be admitted. On average, about 10 % of applicants have been admitted to the programme in the period 2008-2013 (admissions: 32-45 annually; applications 313-467). The figures indicate that the programme is popular and able to attract talented students. The admission rules are consistent with the nature of the studies and skills required from the students. The admission procedure is made publicly available, but may need updating: the students pointed out that the on-line admission calculator does not work properly.

The study programme employs a wide range of teaching and learning methods including lectures, projects, seminars, laboratory work, self-study etc. which are appropriate to the programme aims. Lectures are delivered mostly by professors or associate professors with expertise in the field. Tutorials and laboratory work are guided by professors, associated professors or lecturers. For the laboratory work students are divided into subgroups of ten students supervised by one teacher. An important part of the studies is the experimental Bachelor's Thesis, done under supervision of a senior staff or outside scientist during the last study year.

The students are able to participate in international mobility programmes to obtain important experience and contacts. Every semester one or two biochemistry students take part in Erasmus student exchange programme. The hosts Universities have been in Germany, Norway, Sweden, Denmark, Turkey, Spain, Italy, UK, and Portugal. In addition, about one student each semester participates in Erasmus Practise programme.

Several scholarships are awarded annually to students based on study results. Also, social scholarships are available for students from poor background. Various student-driven activities (organizations, clubs and events) within the University provide important social support. The dropout rate of the admitted students who have started their studies is quite low, in the range of 10 %, suggesting that the students are generally satisfied with their conditions and the study programme.

Students' assessment rules are set up by the Senate of Vilnius University. The range and choice of assessment methods employed vary between courses. Usually, a summative assessment is used which takes into account multiple aspects of student performance (presentations, projects, laboratory work) in addition to the final exam, and is able to provide the students with continuous feedback during the course. In a few courses, however, either only a single assessment (exam) is used or the assessment policy is not transparent (e.g., Biochemistry I and II, Biostatistics). The students expressed their concern about the use of single-exam assessment and regarded it as unbalanced and unfair as it puts disproportionate weight on a single component of student performance. Also, according to the students, course information including

the assessment methods had not been fully available in the web until recently (start of the current study year).

The majority of graduates from the Biochemistry BA programme continue their studies in the Master's level study programmes, molecular biology and biochemistry being the most popular choices.

Overall, the studies are organized in a way that facilitates the achievement of the learning outcomes and accustoms the students with scientific research.

## ***2.6. Programme management***

The Bachelor study programme in Biochemistry is officially administered by the Faculty of Chemistry but involves close cooperation with the Faculty of Natural Sciences, to which the Department of Biochemistry and Molecular Biology belongs. Consequently, the programme is managed at several organizations and levels: Faculty of Chemistry council, Faculty of Chemistry Dean's office, all the Departments involved, and the Study Programme Committee (hereinafter – SPC), which is responsible for the design of the curriculum. The six-person SPC includes the major stakeholders: three professors/researchers representing both faculties, two representatives of employers and other social partners, including a representative of the company ThermoFisher Scientific, and the President of the Lithuanian Academy of Sciences, and one representative of the students. The SPC meetings are organized twice per semester.

Contrary to the departments and faculties, the SPC is the only unit which specifically deals with the Biochemistry BA programme, and therefore it serves a critical function in the management of the programme and in its development. Discussions the review team had with the staff during the site visit suggested that the potential of SPC as an active organ may not yet be fully realized or used. Presently, the initiative appears often to be in the hands of departments, and the decision-making in the Faculties, with SPC playing a minor role. The review team would encourage modifying and strengthening of the role of SPC to be the natural „leader“ of the programme. For example, SPC could play a more prominent role in organizing placement of students for laboratory training and research projects, in the analysis of student feedback and improvement of current survey protocols, in securing that the course information available for the students is complete and up-to-date.

Despite these minor criticisms, the SPC and programme management in general should be commended for their activity in implementing changes to the curriculum based on the recommendations of the latest external evaluation, and of internal evaluations. The changes made in the curriculum include introduction of the new courses Cell biology and Molecular

Biology (the latter transferred from MA programme), an increase in the contact hours in Mathematics and Physics, and the current plans to incorporate more plant biochemistry and biotechnology to the curriculum. These actions clearly reflect a modern reactive management that could be further developed with a slightly stronger and more precisely defined role of the SPC.

Feedback from students is collected by using the on-line surveys organized by Vilnius University at the end of the semesters. The response rate of these surveys is generally low, however, and their usefulness in the continuous development of high-quality teaching can be questioned. Discussions with the students revealed that the importance of the surveys is not fully realized, which may partly explain the low response rates. On the other hand, both teachers and students said that informal discussions at the end of the courses or of the semester are a more efficient method to drive for improvements in the programme. The review panel agrees with this, but also feels that participation in such discussions may not always be comprehensive and therefore the systematic surveys currently in use should be developed to be more efficient and motivating for the students.

Given the strategic importance of biochemical education for Lithuanian bioindustry and the highly esteemed status of the programme among employers and graduates, the administration of the programme, the Faculty of Chemistry in particular, should explore possibilities to increase the number of state-supported students in the programme. During the site visit, the review team learned from the students that the number of state-funded positions may not be adequate and is not comparable to the situation in many other programmes run by the Faculty.

Overall, the management duties in the programme are properly defined but the role of SPC as the sole programme-specific planning organ should be strengthened. The curriculum is actively modified based on external as well as internal evaluations. However, the impact of student feedback on the development of the programme could be improved.

### **III. RECOMMENDATIONS**

1. The efficiency of systematic student surveys should be improved to make them more useful tools in the development of the programme. The review team admits that this may be difficult, especially as the inactivity of students is largely to blame.
2. Bioethics and research ethics should be incorporated into the curriculum in a structured and coherent manner.

3. The administration and the Faculty of Chemistry should actively explore possibilities to increase the number of state-supported students in the programme.
4. The programme should explore possibilities to strengthen the role of the Study Programme Committee and to make it more visible in the active development of the curriculum. SPC could take initiative in improving the student surveys and communication between the programme and the students (e.g., to ensure timely delivery up-to-date information on courses).

#### **IV. SUMMARY**

Analysis of the SER and the fruitful discussions the review team had during the site visit with representatives of Faculty administration, teaching staff, and current students and former graduates, yield a picture of a well-planned and well-run programme, which is able to attract talented and motivated students. This highly positive view was further strengthened by the level of satisfaction expressed by the major employers of biochemists with the education and competencies provided by the programme.

Overall, the objectives and learning outcomes are appropriate for bachelor-level qualification in the study field, consistent with the needs of the labour market, and achievable during the course of the programme. Procedures should, however, be established to ensure that the course information in the web, including the expected learning outcomes, is accurate and up-to-date.

The curriculum is well-planned and solid. The courses cover the essential fields and provide up-to-date scientific information. Strong physic-chemical background emerges as a distinctive feature and strength of the programme. In the future development of the programme, a coherent treatment of relevant bioethics and research ethics should be incorporated in the curriculum.

The teaching staff of the programme is highly qualified, active in scientific research, and able to deliver study courses in the fields of their own expertise, facilitating high-quality teaching and continuous development of the curriculum. Recruitment of staff is somewhat disadvantaged by low salaries, however, which also make it necessary for many teachers to have additional teaching hours outside the VU.

The facilities for teaching and learning and the research laboratories are generally of high quality and sufficient for successful implementation of the programme. Although currently the small size of some of the laboratories may pose practical difficulties in the scheduling, these problems are likely to be solved in the near future with the expected move to the facilities of the brand new Life Sciences Center.

The study processes are organized in a way that facilitates the achievement of the learning outcomes and accustoms the students with scientific research.

The management duties in the programme are properly defined but the role of SPC as the sole programme-specific planning organ could well be strengthened. The curriculum is actively modified based on external as well as internal evaluations. However, the methods for collecting student feedback are currently not working properly and should be improved.

## V. GENERAL ASSESSMENT

The study programme *Biochemistry* (state code – 612C73001) at Vilnius University is given **positive** evaluation.

*Study programme assessment in points by evaluation areas.*

<b>No.</b>	<b>Evaluation Area</b>	<b>Evaluation of an area in points*</b>
1.	Programme aims and learning outcomes	4
2.	Curriculum design	4
3.	Teaching staff	4
4.	Facilities and learning resources	4
5.	Study process and students' performance assessment	3
6.	Programme management	3
	<b>Total:</b>	<b>22</b>

\*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. dr. Kari Keinänen

Grupės nariai:  
Team members:

Prof. dr. Helmut Grubmüller

Doc. Bruno Cardinaud

Prof. dr. Laima Ivanovienė

Benas Gabrielis Urbonavičius



**VILNIAUS UNIVERSITETO PIRMOSIOS PAKOPOS STUDIJŲ PROGRAMOS  
BIOCHEMIJA (VALSTYBINIS KODAS – 612C73001) 2014-12-01 EKSPERTINIO  
VERTINIMO IŠVADŲ NR. SV4-577 IŠRAŠAS**

&lt;...&gt;

**VI. APIBENDRINAMASIS ĮVERTINIMAS**

Vilniaus universiteto studijų programa *Biochemija* (valstybinis kodas – 612C73001) vertinama teigiamai.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	4
2.	Programos sandara	4
3.	Personalas	4
4.	Materialieji ištekliai	4
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	<b>Iš viso:</b>	<b>22</b>

\* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

&lt;...&gt;

**V. SANTRAUKA**

SS analizė ir veiksmingos diskusijos, kurias vizito metu surengė vertinimo grupė su fakulteto administracija, pedagoginiais darbuotojais, dabartiniais ir buvusiais absolventais, byloja apie gerai suplanuotą ir puikiai valdomą programą, kuria gebama pritraukti talentingus ir motyvuotus studentus. Tokį teigiamą požiūrį sustiprino pagrindinių biochemikų darbdavių pasitenkinimas šios programos įgyvendinimu ir kompetencijomis, kurias įgyja studentai. Apskritai tikslai ir

studijų rezultatai yra tinkami bakalauro lygio kvalifikacijai įgyti šioje studijų kryptyje; jie atitinka darbo rinkos poreikius ir yra pasiekiami programos įgyvendinimo metu. Tačiau turėtų būti nustatyta tvarka, pagal kurią internete būtų skelbiama tiksli ir atnaujinta informacija apie studijų dalykus, įskaitant numatomus studijų rezultatus. Studijų programos sandara yra gerai suplanuota ir vientisa. Studijų dalykai apima esmines sritis ir suteikia naujausios mokslinės informacijos. Ryškus fizikinis ir cheminis pobūdis – skiriamasis programos bruožas ir stiprybė. Ateityje tobulinant programą į studijų turinį turėtų būti nuosekliai įtraukiami atitinkami bioetikos ir mokslinių tyrimų etikos aspektai.

Programos darbuotojai yra aukštos kvalifikacijos, aktyviai mokslinius tyrimus atliekantys asmenys, gebantys mokyti studijų dalykų savo kompetencijos srityse ir sudaryti sąlygas aukštos kokybės mokymui ir nuolatiniam studijų programų tobulinimui. Tačiau darbuotojų veiklos sąlygos yra ne visai palankios dėl nedidelių atlyginimų, todėl daugelis dėstytojų papildomai dirba ne tik Vilniaus universitete, bet ir kitose švietimo įstaigose.

Mokymo ir mokymosi infrastruktūra bei mokslinių tyrimų laboratorijos apskritai yra aukštos kokybės, ir jų pakanka norint sėkmingai įgyvendinti programą. Nors šiuo metu kai kurios laboratorijos yra mažos, ir tai gali kelti praktinių planavimo sunkumų, šios problemos artimiausiu metu gali būti išspręstos persikeliant į naujojo Gamtos mokslų centro patalpas.

Studijų procesai organizuojami taip, kad palengvintų studijų rezultatų pasiekimą ir priartintų studentus prie mokslinių tyrimų veiklos.

Valdymo pareigos programoje yra tinkamai apibrėžtos, bet Studijų programos komiteto, kaip vienintelio konkrečių programų planavimo organo, vaidmenį reikėtų stiprinti. Studijų programos sandara yra aktyviai keičiama remiantis išoriniais ir vidiniais vertinimais. Tačiau šiuo metu studentų grįžtamojo ryšio rinkimo metodai veikia netinkamai, todėl turėtų būti tobulinami.

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### **III. REKOMENDACIJOS**

1. Turėtų būti didinamas sisteminių studentų apklausų veiksmingumas, kad jos taptų naudingesnėmis priemonėmis programos rengimo procese. Vertinimo grupė pripažįsta, kad tai gali būti sunku, ypač dėl studentų pasyvumo;
2. Bioetika ir mokslinių tyrimų etika turėtų būti struktūriškai ir nuosekliai įtraukiamos į studijų programą;
3. Administracijos ir Chemijos fakulteto darbuotojai turėtų aktyviai ieškoti galimybių, kaip padidinti šios programos valstybės remiamų studentų skaičių;

4. Turėtų būti išanalizuota, kaip būtų galima sustiprinti Studijų programos komiteto vaidmenį ir pasiekti, kad jis būtų labiau įtrauktas į šios programos rengimo procesą. Studijų programos komitetas galėtų imtis iniciatyvos gerinant studentų apklausas bei komunikaciją tarp šios programos ir studentų (pavyzdžiui, laiku teikiant atnaujintą informaciją apie studijų dalykus).

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