



**STUDIJŲ KOKYBĖS VERTINIMO CENTRAS  
CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION**

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**BIOCHEMISTRY FIELD OF STUDY  
VYTAUTAS MAGNUS UNIVERSITY  
EXTERNAL EVALUATION REPORT**

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5. Student representative: Kamilė Dargytė

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Report prepared in 2026  
Report language: English

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# I. INTRODUCTION

## 1.1. OUTLINE OF THE EVALUATION PROCESS

The field of study evaluations in Lithuanian higher education institutions (HEIs) are based on the following:

- Procedure for the External Evaluation and Accreditation of Studies, Evaluation Areas and Indicators, approved by the Minister of Education, Science, and Sport;
- Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (SKVC);
- Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).

The evaluation is intended to support HEIs in continuous enhancement of their study process and to inform the public about the quality of programmes within the field of study.

The object of the evaluation is all programmes within a specific field of study. A separate assessment is given for each study cycle.

The evaluation process consists of the following main steps: 1) Self-evaluation and production of a self-evaluation report (SER) prepared by an HEI; 2) A site visit by the review panel to the HEI; 3) The external evaluation report (EER) production by the review panel; 4) EER review by the HEI; 5) EER review by the Study Evaluation Committee; 6) Accreditation decision taken by SKVC; 7) Appeal procedure (if initiated by the HEI); 8) Follow-up activities, which include the production of a Progress Report on Recommendations Implementation by the HEI.

The main outcome of the evaluation process is the EER prepared by the review panel. The HEI is forwarded the draft EER for feedback on any factual mistakes. The draft report is then subject to approval by the external Study Evaluation Committee, operating under SKVC. Once approved, the EER serves as the basis for an accreditation decision. If an HEI disagrees with the outcome of the evaluation, it can file an appeal on the basis of the approved EER, SKVC takes one of the following accreditation decisions:

- **Accreditation granted for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points), or good (3 points).
- **Accreditation granted for 3 years** if at least one evaluation area is evaluated as satisfactory (2 points).
- **Not accredited** if at least one evaluation area is evaluated as unsatisfactory (1 point).

If the field of study and cycle were **previously accredited for 3 years**, the re-evaluation of the field of study and cycle is initiated no earlier than after 2 years. After the re-evaluation of the field of study and cycle, SKVC takes one of the following decisions regarding the accreditation of the field of study and cycle:

- To be accredited for the remaining term until the next evaluation of the field of study and cycle, but no longer than 4 years, if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).
- To not be accredited, if at least one evaluation area is evaluated as satisfactory (2 points) or unsatisfactory (1 point).

## **1.2. REVIEW PANEL**

The review panel was appointed in accordance with the Reviewer Selection Procedure as approved by the Director of SKVC.

The composition of the review panel was as follows:

1. Panel chair: Prof. Dr. Kari Keinänen, professor emeritus, Faculty of Biological and Environmental Sciences, University of Helsinki (Finland);
2. Academic member: Prof. Dr. Nestor V. Torres Darias, professor of Biochemistry and Molecular Biology, University of La Laguna (Tenerife, Canary Islands, Spain);
3. Academic member: Associate Professor Dr. Arjan de Brouwer, Department of Human Genetics, Radboud University Nijmegen Medical Centre (The Netherlands)
4. Social partner representative: Dr. Ramunė Leipuvienė, Sr. Product Manager in Molecular Biology, Thermo Fisher Scientific, Vilnius (Lithuania)
5. Student representative: Kamilė Dargytė, Fourth-year Bachelor's student, Applied Chemistry programme, Faculty of Chemical Technology Kaunas University of Technology (Lithuania)

## **1.3. SITE VISIT**

The site visit was organised on 23rd October 2025 onsite.

Meetings with the following members of the staff and stakeholders took place during the site visit:

- Senior management and administrative staff of the faculty(ies);
- Team responsible for preparation of the SER;
- Teaching staff;
- Students;
- Alumni and social stakeholders including employers.

There was no need for translation and the meetings were conducted in English.

## 1.4. BACKGROUND OF THE REVIEW

### Overview of the HEI

Vytautas Magnus University (VMU) established first in 1922 and re-established in 1989, is a University with distinct liberal arts tradition in education. It has 14 faculties or corresponding academic divisions, which offer a large number of study programmes in a broad range of study fields at the three levels of higher education.

### Overview of the study field

The study programme "Biochemical Analysis", is a 2nd cycle programme established and registered in 2001 and hosted by the Faculty of Natural Sciences. The study programme covers 120 ECTS corresponding to two years (four semesters) of full-time studies and leads to a Master's degree in Life Sciences. It belongs to the study area of Biomedical Sciences, more specifically to the study field of Molecular biology, biophysics and biochemistry. The programme aims at training life science specialists in biochemistry/biotechnology to academic research and public sector services and to the growing biotechnology industry, seen as a strategically important area for Lithuanian economy.

### Previous external evaluations

The previous external evaluation of the study programme was carried out in 2014. The programme received a modestly positive review (15 points from the six evaluation areas) and favourable comments relating to the overall coherent curriculum structure, good facilities, and activity of the teaching staff in research and in Erasmus mobility. Areas needing improvement identified in the evaluation report included the description of learning outcomes, teaching in selected topics in biological macromolecules and their analysis, volume of elective courses, involvement of teaching staff and social partners in the design and development of the study programme, and the quality control processes in the study program development and student assessment.

### Documents and information used in the review

The following documents and/or information have been requested/provided by the HEI before or during the site visit:

- *Self-evaluation report and its annexes*
- *Final theses*

### Additional sources of information used by the review panel:

The following additional sources of information have been used by the review panel:

- *Evaluation report of Biochemical Analysis (621C77001) Study Programme at Vytautas Magnus University, 2014*

## II. STUDY PROGRAMMES IN THE FIELD

### Second cycle/LTQF 7

Title of the study programme	<b>Biochemical analysis</b>
State code	6211DX011
Type of study (college/university)	University studies
Mode of study (full time/part time) and nominal duration (in years)	Full-time studies (2 years)
Workload in ECTS	120
Award (degree and/or professional qualification)	Master of Life sciences
Language of instruction	Lithuanian, English
Admission requirements	Bachelor's degree
First registration date	2001-05-24
Comments (including remarks on joint or interdisciplinary nature of the programme, mode of provision)	

### III. ASSESSMENT IN POINTS BY CYCLE AND EVALUATION AREAS

The **second cycle** of the Biochemistry field of study is given a **positive** evaluation.

No.	Evaluation Area	Evaluation points <sup>1*</sup>
1.	Study aims, learning outcomes and curriculum	4
2.	Links between scientific (or artistic) research and higher education	4
3.	Student admission and support	4
4.	Teaching and learning, student assessment, and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	4
7.	Quality assurance and public information	4
<b>Total:</b>		28

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<sup>1\*</sup> **1 (unsatisfactory)** - the area does not meet the minimum requirements, there are substantial shortcomings that hinder the implementation of the programmes in the field.

**2 (satisfactory)** - the area meets the minimum requirements, but there are substantial shortcomings that need to be eliminated.

**3 (good)** - the area is being developed systematically, without any substantial shortcomings.

**4 (very good)** - the area is evaluated very well in the national context and internationally, without any shortcomings.

**5 (exceptional)** - the area is evaluated exceptionally well in the national context and internationally.

## IV. STUDY FIELD ANALYSIS

### AREA 1: STUDY AIMS, LEARNING OUTCOMES AND CURRICULUM

1.1.	Programmes are aligned with the country's economic and societal needs and the strategy of the HEI
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#### FACTUAL SITUATION

##### 1.1.1. Programme aims and learning outcomes are aligned with the needs of the society and/or the labour market

The programme is compellingly justified by its direct and documented alignment with high-priority national and European economic trends. Factual evidence from the Self-Evaluation Report (SER) substantiates that the Life Sciences sector, particularly in BioTech and medical devices, is experiencing significant expansion in Lithuania, yet simultaneously faces a critical shortage of qualified specialists.

The learning outcomes (LOs) are relevant and unique, specifically targeting the capacity to plan and conduct research and apply advanced analytical methods in domains crucial for societal progress, such as translational medicine, personalised medicine, and public health. The professional activity areas of graduates - encompassing research, industry, healthcare, and environmental management - demonstrate a direct correlation with the specified national needs. The curriculum is systematically informed by international best practices from Western European and US universities, ensuring the currency of the content. The rationale for implementing this programme is, therefore, well-substantiated by the clear and unmet demand for second-cycle specialists capable of sophisticated biochemical analysis.

##### 1.1.2. Programme aims and learning outcomes are aligned with the HEI's mission, goals, and strategy

The degree's aims and outcomes exhibit robust consistency with the strategic mission of VMU as a research-intensive classical university with a Liberal Arts profile.

The curriculum actively supports the University's objective to share knowledge and experience with the wider community (Strategic Task 5.4.2) by integrating learning outcomes that develop the ability to convincingly present scientific research results to varied audiences. Furthermore, the programme leverages the University's commitment to scientific infrastructure, operating within modern study and research laboratories. This structural support ensures the achievement of practical LOs related to experimental work and instrumental analysis (Strategic Task 4.4.3). The content is consistently reinforced by the teaching staff's research, which is entirely centred around and congruent with the field of the second cycle programme, confirming the integration of high-level scientific inquiry into the educational process.

#### ANALYSIS AND CONCLUSION (regarding 1.1.)

The aim is that programme is aligned with the country's economic and societal needs and the strategy of the HEI is partially met. The thematic alignment of the programme with both the national economy (Life Sciences, BioTech) and the institutional strategy (research-led education, knowledge dissemination) is exemplary.

However, the assessment also suggests that the operationalisation of this alignment could benefit from further refinement. The SER notes an ongoing opportunity to “activate the involvement of alumni and employers in the management and quality improvement of the study programme”. This implies that, while the curriculum content remains appropriate, the formal and systematic governance mechanisms that support continuous responsiveness to labour market needs could be strengthened, an aspect already highlighted in previous evaluations. Likewise, the currently limited involvement of students in funded research projects, despite their evident interest, highlights untapped potential within the programme’s research environment and suggests opportunities to more fully realise its scientific strengths

1.2.	Programmes comply with legal requirements, while curriculum design, curriculum, teaching/learning and assessment methods enable students to achieve study aims and learning outcomes
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## FACTUAL SITUATION

### 1.2.1. Programmes comply with legal requirements

The analysis of the "Self-evaluation report" (SER) and its annexed Study Plan confirms that the second-cycle Biochemical Analysis programme adheres systematically to the legal provisions governing the study field, cycle, and structural organisation in the Republic of Lithuania.

**Field of Study.** The programme is unequivocally aligned with the Biochemistry (D 06) study field. The programme's goal, which is to cultivate specialists with advanced analytical and knowledge skills in biochemistry, is defined in accordance with the Descriptor of the Group of Study Fields of Life Sciences. The course structure, comprising core subjects such as *Cell and gene engineering*, *Membranes and bioenergetics*, and *Separation methods in biotechnology*, confirms the specialized focus and direct compliance with the Field Descriptor's knowledge base. The maintenance of a single, highly specialized Master's programme in this field simplifies resource concentration and ensures programmatic depth.

**Cycle.** The programme structure is formally registered as a Second cycle/7 LTQF level qualification. This designation signifies full compliance with the learning outcomes and level of complexity prescribed by *The descriptor of study cycles* for Master's level education, which mandates the development of autonomous research, problem-solving, and critical assessment abilities in a specialized domain.

**Structure of Programme.** The programme structure strictly adheres to the mandated credit requirements for a second-cycle qualification, regarding aspects such as the Total Programme Workload, credits for the Study Field, Credits for Practice-Based Learning, Credits for Final Thesis (Project) and contact Hours and Independent Student Work.

### 1.2.2. Programme aims, learning outcomes, teaching/learning and assessment methods are aligned

The programme demonstrates a high degree of vertical and horizontal alignment between its stated aims, the articulated learning outcomes, the employed teaching and learning methodologies, and the assessment mechanisms. This alignment is systematically managed and validated through explicit structural design.

The programme's learning outcomes are coherently formulated to encompass and meet all components of the stated study aim. The outcomes of individual study courses are consistently compatible with, and contribute directly to, the overall programme outcomes, ensuring a purposeful progression through the curriculum. This is critical for a Master's degree, ensuring specialized competence.

The core of this alignment mechanism is the integration of advanced research methodologies with the programme's research-intensive objective. Course outcomes are designed to enable students to execute scientific activities, apply research methods, formulate complex problems, and select appropriate methodologies. The ultimate expression of this alignment is the Master Thesis (30 ECTS) in the final semester, which requires students to synthesize and apply accumulated theoretical knowledge and practical skills to contemporary interdisciplinary topics. The consistently high-level nature of these final projects confirms that the preceding instruction and assessment successfully prepared students for the required autonomous academic output.

The curriculum structure intentionally promotes student personal autonomy and active, participatory learning consistent with a Level 7 qualification.

VMU's institutional Liberal Arts model allows students a degree of elective choice, fostering self-directed study. More significantly, the mandatory Research Work No. 1 and No. 2 modules (12 ECTS total) are structured with a high ratio of independent student work to contact hours (e.g., 4 contact hours to 156 independent work hours for Research Work No. 2). This design compels students to exercise considerable autonomy in planning and conducting their research, which is paramount for a Master of Science qualification.

**Active and Participatory Learning.** The utilisation of seminars and laboratory works as primary teaching methods, explicitly reflected in the study plan and assessment forms, ensures an active and participatory environment. Furthermore, a significant portion of final theses are executed in collaboration with social partner institutions (e.g., Thermo Fisher Scientific), providing a constructive environment where academic staff and external partners co-construct learning through practical application.

The HEI effectively employs assessment as a training-oriented tool, promoting a continuous and formative approach. The structure of assessment for compulsory courses typically involves multiple components—mid-term exams, practical work/laboratory reports, and a final exam—rather than relying solely on summative final examinations. This multi-point evaluation system inherently supports continuous assessment. Crucially, research components, such as Research work No. 2, are assessed via Semester work (70%) and Oral presentation (30%). The oral presentation segment, in particular, functions as a direct mechanism for formative feedback, allowing the student to improve their communication and scientific defence skills prior to the Master's Thesis. This is complemented by the fact that graduating students award the highest scores to the opportunities to consult with lecturers, indicating a strong culture of academic support and feedback which underpins a formative assessment environment. The overall system for monitoring students' learning progress is explicitly designed to assist students in achieving strong academic outcomes.

The HEI demonstrates a demonstrable interest in educational innovation and the continuous development of its teaching staff's pedagogical skills. VMU provides internal professional development courses for academic staff on highly contemporary topics such as the "Use of Artificial Intelligence in Science and Study Process," alongside training focused on fundamental skills like "Student Achievement Assessment and Feedback" and "Lecturer's Self-Assessment and

Continuous Professional Development". Furthermore, the HEI facilitated access for staff and students to the Coursera platform to pursue additional, desired courses. This sustained commitment to providing internal and external pedagogical training and incorporating topics of educational innovation confirms a proactive institutional strategy for maintaining teaching quality and relevance. The regular updating of curricula, influenced by Western European and US university practices and internal quality assessments, is a further testament to this systemic interest in innovation.

### 1.2.3. Curriculum ensures consistent development of student competences

The curriculum for the second-cycle Biochemical Analysis programme demonstrates a structure engineered to facilitate a consistent and incremental maturation of student competences, aligning with the requisite Level 7 of the National and European Qualification Frameworks.

The programme's fundamental design is inherently coherent and non-repetitive, a quality previously noted by external experts. Core compulsory study subjects, such as *Cell and Gene Engineering*, *Membranes and Bioenergetics*, and *Separation methods in biotechnology*, are strategically placed in the initial semesters to construct an advanced theoretical and methodological foundation essential for specialized biochemical analysis.

The relevance and uniqueness of the learning outcomes are substantiated by their direct correspondence to the advanced analytical and research proficiencies required by the rapidly evolving Life Sciences industry, including biotechnology and translational medicine. The curriculum's content is systematically updated, leveraging both internal quality assessments and external labour market signals, to maintain its contemporary value.

A critical feature ensuring competence progression is the systematic scaffolding of research capabilities. This is achieved through the mandatory inclusion of Research work No. 1 in the early stages and a subsequent Research work No. 2 in the third semester, both preceding the culminating Master Thesis of 30 ECTS in the final semester. This intentional sequencing transitions the student from supervised project execution to a high degree of autonomous scientific inquiry, which is the hallmark of a Master's degree. The successful achievement of these cumulative competences is objectively validated by the completed Master Theses. These final research projects consistently address complex, high-level contemporary interdisciplinary topics (e.g., microbial resistance mechanisms, advanced electroporation techniques, effects of novel physical stimuli on biological systems) and receive commendably high evaluations, confirming the attainment of sophisticated analytical and problem-solving skills.

The HEI's focus on a single, specialized Master's programme in this field (D 06 Biochemistry) ensures a concentration of resources and academic expertise, providing a robust rationale for the programme's implementation and maximizing the possibility for its quality development and specialization in alignment with the University's mission.

Rating: 4 (Very Good). The area is being developed systematically and is evaluated very well in the national context, without any substantial shortcomings. The evidence strongly supports a highly effective and coherent curriculum, meeting the highest national standards for progression and research output.

### 1.2.4. Opportunities for students to personalise curriculum according to their personal learning goals and intended learning outcomes are ensured

The programme's curriculum is structured to integrate compulsory specialisation with robust, research-driven mechanisms that facilitate the attainment of individual learning goals, a necessity for a Level 7 qualification. Personalisation is implemented through a combination of elective course selection and the significant autonomy granted within the research components.

The study plan provides a formal opportunity for personalisation through the allocation of a 6 ECTS elective course in the third semester. This choice allows students to select one subject either to deepen their specialization within Biochemistry (*Plant cell physiology and biochemistry*) or to pursue a trajectory towards related Biotechnology fields (*Genetically modified organisms, Biotechnology in medicine, or Chemical and biochemical microanalysis*). This structured elective choice enables the student to begin tailoring their academic pathway in alignment with specific professional interests, such as those in the medical or microanalysis sectors.

The maintenance of a single, focused programme in Biochemistry (D 06) ensures that the core curriculum remains compliant with the Field Descriptor, providing the necessary specialized knowledge. The primary method of customisation—the Master's Thesis—is inherently aligned with the Second Cycle/Level 7 requirement for generating new knowledge and demonstrating autonomous scientific inquiry. The wide-ranging, contemporary, and often interdisciplinary topics of the final theses (Annex 2), which address areas from efflux pumps in cancer cells to nanosecond pulse electroporation, empirically confirm that individual learning goals can be pursued while rigorously meeting the required academic level and contributing to the specialized field.

The Master's Thesis (30 ECTS) is the most profound element of curriculum personalisation. The process is defined by high levels of student autonomy. Thus, students choose their thesis topic and supervisor, commencing their self-directed research as early as Research work No. 1. This initial 6 ECTS of individually chosen topic analysis acts as a foundational, personalized precursor to the main thesis. Also, the institutional effectiveness of this personalisation is confirmed by the EXIT survey data, where graduating students rated their cooperation with supervisors as smooth, indicating a supportive and effective environment for individual research direction. Finally, the public presentation of Research works and the subsequent final thesis defence constitute the formal assessment of the student's personalized knowledge contribution. This final stage requires the student to clearly articulate and defend the unique focus of their work to the academic committee, thereby formalising the attainment of their advanced, individualised learning outcomes.

#### 1.2.5. Final theses (applied projects) comply with the requirements for the field and cycle

The evidence provided, specifically the list of successfully defended Master's Theses (Annex 2), demonstrates a systematic and high-level compliance with the requirements for both the Biochemistry (D 06) field and the Second Cycle (Level 7) qualification.

The thematic scope of the final theses is rigorously confined to and advances the specialised knowledge base of biochemistry and molecular life sciences. The thesis titles consistently reflect research problems requiring advanced analytical skills in complex biological systems. Examples include investigations into efflux pumps in multidrug resistance and nanosecond pulse electroporation for increasing transfection efficiency. These topics confirm the programme's focus on contemporary, interdisciplinary, and high-priority research areas, such as health and biotechnology, which is entirely appropriate for the field.

The Final Thesis is structurally assigned 30 ECTS, signifying a substantial commitment to independent, scholarly work, which is the defining characteristic of a Level 7 qualification. The content and intellectual demands of the theses meet the Descriptor of Study Cycles requirement for

students to plan and implement fundamental and applied scientific research and demonstrate autonomous creative work. The process, starting with the selection of a personalised topic and guided through preliminary research modules (Research Work No. 1 and No. 2), ensures a logical and rigorous preparation for the final project. The high evaluation scores attained by the majority of the theses (predominantly 9s and 10s) further validate that graduates are successfully achieving the required depth of analysis, critical data evaluation, and generation of original insights.

The integrity of the process is maintained by several factors: the mandatory use of an anti-plagiarism system (iThenticate) for all theses, and the positive student feedback regarding the smooth cooperation with supervisors. The defence, conducted as a public presentation, ensures that the work's compliance is formally adjudicated by an academic committee, which includes both the field and cycle requirements in its appraisal.

### **ANALYSIS AND CONCLUSION (regarding 1.2.)**

The evaluation of the Master of Life Sciences (Biochemistry) programme at Vytautas Magnus University (VDU) demonstrates a high level of structural integrity and systematic development in its curriculum, largely meeting the standards for a second-cycle research qualification.

The programme's aims and learning outcomes exhibit exemplary thematic alignment with the national high-priority needs, specifically the burgeoning Life Sciences and BioTech sector, and robust consistency with the University's mission as a research-intensive institution. However, there remains an aspect that could be further strengthened to fully support this alignment: the formal, cyclical mechanism for the active involvement of alumni and social partners in the Study Programme Committee is still in the process of maturing, which may somewhat limit the programme's capacity for dynamic responsiveness to labour market developments. The curriculum is systematically engineered for consistent competence development, strictly adhering to all structural and legal requirements for a Level 7 qualification. A high degree of alignment is maintained between programme aims, learning outcomes, teaching methodologies (emphasizing active learning), and multi-point assessment 4. The intentional design, which systematically scaffolds research proficiency through mandatory preliminary Research Work (12 ECTS), preceding the culminating Master Thesis (30 ECTS), is highly effective. This rigorous structure ensures that the capstone projects successfully comply with the field and cycle requirements, consistently demonstrating the attainment of advanced analytical and autonomous scientific inquiry skills, which is the dominant and highly effective mechanism for curriculum personalisation.

## **AREA 1: CONCLUSIONS**

	<b>Unsatisfactory - 1</b> Does not meet the requirements	<b>Satisfactory - 2</b> Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b> Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b> Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b> Exceptionally well nationally and internationally without any shortcomings
<b>AREA 1</b>					
<b>Second cycle</b>				<b>X</b>	

## COMMENDATIONS

1. The design of the Master's study plan, which allocates 30 ECTS to the Master Thesis, further supported by the mandatory and sequential *Research Work No. 1 and No. 2* (12 ECTS), ensures the systematic and profound development of autonomous scientific research competence.
2. The total integration of the teaching staff's high-level research agenda into the curriculum content is a significant strength, ensuring that instruction is delivered at the cutting edge of the discipline and directly reinforcing the University's mandate as a research-focused institution.
3. The HEI is highly commended for proactively offering targeted pedagogical training for staff on contemporary topics, notably the "Use of Artificial Intelligence in Science and Study Process," reflecting a forward-thinking institutional strategy for integrating modern technological and educational trends.

## RECOMMENDATIONS

To address shortcomings

None

For further improvement

1. The programme should formalize a mandatory, cyclical mechanism for the active participation of alumni and key social partners in the Study Programme Committee's decision-making process, progressing from mere consultation to systemic quality management and continuous labour market responsiveness.
2. The HEI should establish a clear policy to ensure the direct, integrated participation of all second-cycle students in ongoing, funded departmental research projects, thereby closing the critical gap between the existing high-level research environment and its full didactic utilization.
3. The programme should more explicitly embed international mobility opportunities, particularly via the Erasmus framework, within the research progression pathway (e.g., during the Research Work components). This strategic integration is necessary to strengthen the programme's international dimension through exposure to diverse laboratory environments and methodologies.
4. The HEI should implement a mechanism to systematically disseminate the successful pedagogical methodologies emerging from the lecturer training and self-assessment activities across the faculty. This will ensure that the innovative practices developed by individual staff members become institutionalised best practices for active and participatory learning.

## AREA 2: LINKS BETWEEN SCIENTIFIC RESEARCH AND HIGHER EDUCATION

2.1.	Higher education integrates the latest developments in scientific (or artistic) research and technology and enables students to develop skills for scientific (or artistic) research
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## FACTUAL SITUATION

### 2.1.1. Research within the field of study is at a sufficient level.

Researchers at VMU and its Faculty of Natural Sciences conduct active research in the field of biochemistry providing strong support to the Biochemical Analysis study programme. Scientific activities at VMU are regularly analysed in the context of external Comparative External Assessment of Research and Development of all national universities and research institutes, and in the annual evaluation by Lithuanian Research Council (RCL). In the latest evaluations, research in biochemistry has shown improvement in the four-year period 2020-2023 when measured by the number of high-impact articles ("Top 10" articles), work productivity units, and scores/points obtained in research evaluations. VMU researchers in the field of biochemistry publish regularly their research findings in well-established international scientific journals, with occasional publications also in the high-end top journals. In the latest evaluation, biochemistry research at VMU received a score of 3 (of 5), corresponding to moderately good level, but also indicating need for development. Relatively small number of PhD students enrolled in biochemistry and low level of external funding were also pointed out in the evaluations. There are some recent signs of improvement of the situation, however. Since the latest evaluation, Department of Biochemistry has moved to new facilities and several active researchers from biophysics group have joined the Department to form new laboratories, which focus on cell and tissue biotechnology and cellular responses to stress. These changes are expected to increase the number of higher impact publications, PhD students and the amount of research funding. Overall, research in biochemistry is at a sufficient level to provide support to the study programme of Biochemical analysis.

### 2.1.2. Curriculum is linked to the latest developments in science, art and technology.

The research topics in the field of biochemistry range from cell and tissue engineering, plant biochemistry and physiology and microbiology to membrane bioenergetics and new optical technologies. The topics are relevant in current biochemical research and provide support to the study programme in the form of internships, lab practicals and Master's thesis projects. Most teachers in Biochemical Analysis study programme courses are active researchers and therefore capable of providing up-to-date information of the latest research in the topics they teach. Therefore, the curriculum has strong links to current research.

### 2.1.3. Opportunities for students to engage in research are consistent with the cycle.

The students in the Biochemical Analysis study programme are integrated in research mainly through internships, laboratory practice and Master's thesis work done in the research groups on topics relevant to current research and supervised by active researchers. During the first two semesters, the students are informed of the research groups and topics available and invited to join the research groups of their interest. The information is also published in the faculty website for the programme. In addition to the Department of Biochemistry, other VMU units and social partners of the study programme can provide topics and supervision for internships and Master's theses. According to discussion with the students, the teachers and researchers associated with the study programme are friendly and easily approachable.

## **ANALYSIS AND CONCLUSION (regarding 2.1.)**

The study programme has excellent new facilities and instrumentation at its disposal and most of its teachers conduct active research in biochemistry or closely related fields. The students are able to enter the research from the start of their Master's studies. The research topics are consistent with the aims of the study programme and supportive to the programme. Currently, there is room for

improvement in the research output and funding, but overall the study programme is capable of integrating the developments in science to teaching and enabling students to develop skills for scientific research. The open, welcoming atmosphere in the programme is an additional factor which promotes the fluent integration of students to research projects.

## AREA 2: CONCLUSIONS

<b>AREA 2</b>	<b>Unsatisfactory - 1</b> Does not meet the requirements	<b>Satisfactory - 2</b> Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b> Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b> Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b> Exceptionally well nationally and internationally without any shortcomings
<b>Second cycle</b>				<b>X</b>	

### COMMENDATIONS

1. The new, spacious and well-equipped facilities, open welcoming atmosphere and active ongoing research in topics relevant to the study field provide an excellent home base for the study programme and its students.
2. The students get informed on research opportunities and invited to join research groups at the very beginning of their studies.

### RECOMMENDATIONS

To address shortcomings

None

For further improvement

1. The panel suggests the programme to consider advertising the research works and final thesis projects available in VMU and in the laboratories of its social partners in the public and private sectors on the website of the programme or via other means to give the students a view of the variety and range of the projects (and the study field) and ensure that all students are equally informed of the options.
2. The Faculty and Department should continue their efforts to strengthen the scientific research and its funding in the field of biochemistry, for example by providing support to researchers with high potential for success in the preparation of grant applications, via new interdisciplinary projects, etc.

## AREA 3: STUDENT ADMISSION AND SUPPORT

3.1.	Student selection and admission is in line with the learning outcomes
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### FACTUAL SITUATION

- 3.1.1. Student selection and admission criteria and procedures are adequate and transparent

Admission to the second-cycle Biochemistry programme at VMU follows national requirements for master's studies and institutional regulations approved by the Senate. Applicants must hold a first-cycle qualification in biochemistry, molecular biology, biotechnology, or a related biomedical sciences field. Adequate preparation in core subjects such as molecular biology, analytical chemistry, enzymology, and laboratory practice is required to meet the learning outcomes of the second cycle.

Admission procedures are carried out through the VMU online admission platform. Applicants submit academic transcripts, qualification documents, motivation statements, and, where relevant, proof of laboratory experience. Selection criteria and deadlines are publicly available on the VMU website, programme descriptions and Study Department channels. Consultations for prospective students are provided by the Faculty and the Study Department.

During the last three years, the programme has received between 18 and 26 applications annually, of which 8–14 students were admitted, depending on available study places. A notable proportion of admitted students already work in clinical, analytical, or research laboratories, which aligns with the professional orientation of the programme and increases the relevance of its practical components. Dropout during the evaluation period was minimal (1–2 students per cohort), indicating effective selection and adequate preparedness of entrants.

### 3.1.2. Recognition of foreign qualifications, periods of study, and prior learning (established provisions and procedures)

According to Methodology Annex 1, the Self-Assessment Report must provide: the principles for recognition of foreign qualifications, partial learning outcomes, prior learning and other learning; information on the application of these principles: data from the last three years on accredited and non-accredited cases, including reasons for non-recognition.

VMU applies national and institutional regulations for the recognition of foreign qualifications and credits obtained during mobility. The recognition procedure is administered by the Academic Affairs Unit in cooperation with the International Cooperation Department, following the legal guidelines of the Ministry of Education, Science and Sport and, when required, consulting the Centre for Quality Assessment in Higher Education (SKVC). Information on required documents, evaluation criteria, and timelines is publicly available on the university website and communicated through the International Cooperation Department.

The University also implements the recognition of competencies acquired through non-formal and informal learning, following updated institutional regulations that ensure transparency, consistency, and equal treatment of applicants. These procedures enable the formal acknowledgement of relevant learning outcomes and competencies when students request such recognition. Recognition of partial studies is based on an assessment of learning outcomes, credit volume, and course correspondence with VMU curriculum components.

In line with Methodology Annex 1 requirements, data from the last three years must be provided. During the evaluation period (2021–2023), no applicants to the second-cycle Biochemistry programme submitted requests for recognition of foreign qualifications, partial studies, or non-formal/informal learning outcomes. Therefore, no accredited or non-accredited cases occurred, and no reasons for non-recognition were registered. Although no applications were received, the procedures are clearly defined, publicly available, systematically applied at the institutional level, and ready to be enacted when needed.

## **ANALYSIS AND CONCLUSION (regarding 3.1.)**

The analysis of the factual situation shows that admission to the second-cycle Biochemistry programme is implemented in a transparent and criteria-based manner, in full alignment with VMU regulations and national admission requirements. The publicly available admission information, clear programme-specific prerequisites, and the structured application process ensure that applicants understand the requirements and the basis on which their applications are evaluated. Discussions with students confirmed that the admission procedures are straightforward, understandable, and free of irregularities, indicating that the system functions reliably.

The principles and procedures for the recognition of foreign qualifications, partial studies and prior learning are clearly defined and appropriately implemented. The institutional process follows national legislation and VMU regulations, ensuring consistency, quality, and equal treatment of applicants. Students who underwent mobility-related recognition procedures reported that the process was smooth and well organised, with no administrative barriers. The absence of recognised or non-recognised cases during the period under review reflects the limited number of applicants requiring recognition rather than any procedural shortcomings. The recognition framework is fully prepared for application when needed and is publicly accessible through dedicated university channels.

Overall, the admission and recognition processes support the programme's ability to attract and admit academically prepared candidates who meet the expected entry requirements. The system ensures transparency, fairness, and alignment with programme learning outcomes. The standard is fully met.

3.2.	There is an effective student support system enabling students to maximise their learning progress
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## **FACTUAL SITUATION**

### **3.2.1. Opportunities for student academic mobility are ensured**

VMU provides access to Erasmus+ and other international mobility schemes, including study and traineeship mobility. Information on mobility options, funding opportunities, deadlines, partner institutions, and recognition procedures is communicated through the VMU website, official email channels, faculty international coordinators, and the International Cooperation Department.

Despite the broad institutional mobility framework, actual participation from local (Lithuanian) students remains low. Students reported that mainly international students use Erasmus opportunities, while Lithuanian students often refrain due to financial constraints, uncertainty about full credit recognition, and the competitive nature of funding allocation. Some students noted that they applied for Erasmus mobility but did not receive funding, while others participated only in short-term activities that were not always credited at full academic value.

Incoming mobility is also limited, as some partner institutions offer modules not fully aligned with the Biochemistry curriculum, making recognition more complex. While the structural framework for mobility is in place, actual student participation remains low due to these practical barriers.

### **3.2.2. Academic, financial, social, psychological, and personal support provided to students is relevant, adequate, and effective**

Students receive academic support through lecturer consultations, timely feedback, and individual academic guidance, especially during examinations or laboratory work. VMU offers psychological

counselling, financial assistance schemes, and social support. Students reported strong lecturer engagement and a positive academic atmosphere. They highlighted the value of laboratory-based learning, while also expressing interest in more extensive theoretical preparation in certain advanced topics.

Accommodation in university dormitories is available for full-time students. Students noted that living conditions are adequate, pricing is considered reasonable, and access to dormitory places does not present significant issues. Overall, the support system is well organised, responsive, and accessible through multiple channels.

### 3.2.3. Higher education information and student counselling are sufficient

Information about academic requirements, elective options, assessment procedures, and study organisation is available through faculty websites, Moodle, introductory sessions, and consultations with programme staff. Students receive guidance on academic planning; however, some expressed uncertainty regarding their role in programme governance and limited awareness of how elective subjects are structured within the programme. Despite this, they confirmed that essential academic information is communicated clearly and that counselling services are accessible and supportive.

## ANALYSIS AND CONCLUSION (regarding 3.2.)

The programme provides a comprehensive system of academic, financial, social, and psychological support, which students find accessible and effective. Information channels function reliably, ensuring that students remain informed throughout their studies. Lecturer engagement, practical laboratory training, and supportive counselling contribute positively to student well-being and academic success.

However, despite the availability of Erasmus+ and institutional cooperation agreements, *actual participation in international mobility remains low*. Students consistently identified funding limitations, concerns about full credit recognition, and mismatches between partner institutions' modules and the Biochemistry curriculum as key barriers. These issues disproportionately affect local students, limiting outgoing mobility. Incoming mobility is similarly constrained due to curriculum specificity.

Overall, the support system meets the requirements of the standard, but mobility-related constraints require further improvement.

## AREA 3: CONCLUSIONS

AREA 3	Unsatisfactory - 1 Does not meet the requirements	Satisfactory - 2 Meets the requirements, but there are substantial shortcomings to be eliminated	Good - 3 Meets the requirements, but there are shortcomings to be eliminated	Very good - 4 Very well nationally and internationally without any shortcomings	Exceptional - 5 Exceptionally well nationally and internationally without any shortcomings
Second cycle				X	

## COMMENDATIONS

1. The programme provides a supportive academic environment, characterised by accessible lecturers, timely feedback, and strong engagement in both theoretical consultations and laboratory-based learning.
2. Students benefit from a well-developed system of academic, psychological, social and financial support, which is consistently accessible and responsive to student needs.
3. Effective communication channels (website, email, faculty-level consultations, programme staff) ensure timely dissemination of information related to studies, mobility opportunities, and academic planning.

## **RECOMMENDATIONS**

To address shortcomings

None

For further improvement

1. Strengthen theoretical preparation in certain advanced subjects to complement practical laboratory activities and support deeper conceptual understanding.
2. Improve student awareness of programme governance structures and enhance clarity regarding the organisation of elective subjects.
3. Broaden communication on mobility funding opportunities, expected timelines, and available options to encourage higher participation from local students.

## **AREA 4: TEACHING AND LEARNING, STUDENT ASSESSMENT, AND GRADUATE EMPLOYMENT**

4.1.	Students are prepared for independent professional activity
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### **FACTUAL SITUATION**

4.1.1. Teaching and learning address the needs of students and enable them to achieve intended learning outcomes

The Biochemical Analysis Master's programme is a full-time, 2-year programme. The learning outcomes and teaching methods are well-adjusted to modern day teaching. A variety of teaching methods is used including conventional lectures, seminars, and laboratory work. In courses, problem-based learning, case studies, and scientific literature is taught.

The independent competences of the students are assessed during the courses through individual work. This is essential to develop critical thinking and analysis. Teamwork abilities, which include amongst others social skills, time management, are also assessed during group projects in diverse courses. Students can always have individual consultations with the teacher to get feedback on their progress in the course and in their studies. The students show their appreciation of this by positive comments on the surveys. Student satisfaction indicators show a three-year average of 71% satisfaction with knowledge and skills acquired through study activities and 57% through

independent tasks. Seminars and laboratory work provide essential scientific and practical training, using methods such as modelling, simulations, project work, and group discussions, helping students build analytical and technical competences relevant to careers in biosciences.

Independent learning is developed through individual and group assignments, preparation for assessments, and research work. Courses may be assessed in written, oral, or online formats, and peer evaluation may supplement teacher evaluation. The individual grades are included in a cumulative score that reflects this development. Typically an exam contributes 30-60%, a mid-term test 15-35% and the laboratory works, seminars and such like, also 15-35% to the final grade of a course. Support for blended and online teaching is given by the support team. For these and other purposes Moodle, a digital platform, where also other course material is uploaded, is present. Study methods are continuously updated in response to scientific, labour-market, and didactic developments.

Upon graduation, students may continue their studies in PhD programmes in life sciences, biotechnology, or related fields at VMU or other institutions. Typically, 1–2 graduates each year (out of 6–7) pursue doctoral studies at VMU, KTU, LSMU, or research institutes such as LAMMC or LEI.

#### 4.1.2. Access to higher education for socially vulnerable groups and students with individual needs is ensured.

Students and staff of the university have all the opportunities to access the facilities of the university. This is endorsed by the VMU senate. Socially vulnerable students with special needs can determine an own individual learning path and postpone assessments if needed. There are also discounts on tuition or dormitory fees for socially vulnerable groups, which include students with disabilities, orphans, and low-income families. Accessibility of the campus premises is ensured by special parking spaces next to the buildings, the libraries are equipped with facilities that assist people with disabilities, and classrooms are furnished with furniture that enables them to go there anytime. Besides this, the university hosts various events to raise awareness about inclusion. The teaching staff is well aware of these provisions and ready to implement these whenever they are needed.

### **ANALYSIS AND CONCLUSION (regarding 4.1.)**

The learning outcomes and teaching methods are well-adjusted to modern day teaching. There is a minor inaccuracy in the wording of learning outcome on '*Special abilities*' (SER, Table 1.2.) The words "acquire skills" refer to an active process, not a learning outcome or goal, and could be substituted by ability to apply knowledge. In addition, the assessment of the learning outcomes should be AI proof. Expert group would also suggest to add one learning outcome dedicated towards AI literacy beyond the general guidelines provided by the VMU.

Access to the university for socially vulnerable groups and students with disabilities is well arranged. The teaching staff knows about the arrangements that can be made to grant access to the biochemistry teaching programme.

4.2.	There is an effective and transparent system for student assessment, progress monitoring, and assuring academic integrity
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### **FACTUAL SITUATION**

#### 4.2.1. Monitoring of learning progress and feedback to students to promote self-assessment and learning progress planning is systematic

Students' progress is monitored systematically and includes evaluating students' readiness, tracking course registrations, identifying reasons for missed assessments, analysing interim and final results, and reviewing periodic student surveys and overall study experiences. Based on these data, the university implements measures to enhance study quality, strengthen student engagement, and support social integration, offering various forms of academic, financial, psychological, and social assistance.

This monitoring process operates at three levels: individual, faculty, and university. Students track their own progress through the student portal and Moodle. Teachers observe achievement trends and provide feedback and support. At the faculty level, staff intervenes early when students show low performance, helping maintain high retention rates. At the university level, units such as the Student Affairs and Study Departments perform ongoing monitoring, provide guidance on academic procedures, and ensure continuous feedback through online systems, consultations, and assessment discussions. This structured oversight enables students to understand their progress, identify challenges, and access timely support throughout their studies.

Feedback is provided on written examination, results of seminars, and of individual assignments. This stimulates the effectiveness of the students' learning process. The results can be discussed in student groups or face-to-face (or online) with the teachers. Students with lower scores on their mid-term assessment are invited for individual conversations to solve issues. Preventive measures are given to those students that keep underachieving. These can be in the form of financial and/or psychological support, social integration etc. At a university level, the department performs regular monitoring of the achievements of the students. In case of absence during a test, alternative options are suggested to the students, e.g. to postpone their test or any other measure. A student who fails a test, can always do a resit once.

#### 4.2.2. Graduate employability and career are monitored

Graduates can use the VDU Alumni ID interactive platform to network with other alumni amongst others. This is supported by an alumni coordinator, who handles the planning and organization of alumni-related activities. The university actively monitors alumni career outcomes using surveys, national employment statistics, and departmental follow-ups. One year after graduation, the VMU career centre distributes an online survey for alumni to ask about job security and satisfaction. They are also asked to give their opinion about what they have learned for the labour market. Summarized survey results are posted on the university website. Besides this, after one year, statistical information about job search is also available. On top of that the department of biochemistry collects data as well concerning employment in a yearly gathering of alumni.

Employment data indicates that 85% is employed within 6–12 months after graduation, and 55% working in highly skilled positions based on data from 2021–2023. These figures indicate that the degree effectively supports graduates in securing high-quality jobs. However, the available employment statistics reflect only employment within Lithuania. As a result, the data cover only graduates working under formal employment or copyright contracts, or those earning income from sports or performance activities, meaning actual employment rates may be even higher.

Survey data from recent graduates of the MSc Biochemical Analysis programme show that students highly value the knowledge and skills gained. Because participation in the university's 12-month post-graduation surveys is low, feedback relies mainly on data from graduating students rather than

established professionals. Students highlight strong laboratory facilities, a supportive study environment, accessible supervision, and flexible scheduling as key strengths of the programme. Graduates consistently express high satisfaction with VMU's role in preparing them for the labour market. Employment data indicate that most graduates find work in life sciences companies, showing strong alignment between the programme and industry needs. Still, career pathways vary, with some graduates pursuing further studies or experiencing temporary job-seeking periods. Overall, the high employment rate and relevance of jobs demonstrate that the programme effectively prepares students for professional practice. Continuous monitoring remains important to ensure the programme keeps meeting employer expectations and supports graduate success.

#### 4.2.3. Policies to ensure academic integrity, tolerance, and non-discrimination are implemented

The principles of integrity are defined in the Statute of VMU, Code of Ethics of VMU, VMU Provisions on Prevention of Plagiarism in Student Written Works, and VMU Study Regulations. Non-discrimination measures are regulated by Code of Ethics of VMU. These policies are implemented through regular training sessions for both faculty and students, clear reporting mechanisms for instances of discrimination or harassment, and evaluation that ensures equal opportunities for all students. In case of dishonest student behaviour observed during any assessment, such as the unethical use of AI generated content, or plagiarism, is handled by the Dean who will start an investigation of the respective students' works. Both teachers and students have the right to appeal to the university's academic ethics commission.

No violations of academic integrity, tolerance, or non-discrimination were recorded during the review period, reflecting the effectiveness of the programme's preventive culture.

#### 4.2.4. Procedures for submitting and processing appeals and complaints are effective

Appeals and complaints are dealt with efficiently and swiftly according to VMU Regulations of the Dispute Resolution Commissions, VMU Provisions on Prevention of Plagiarism in Student Written Works, and VMU Study Regulations. Students have the right to appeal regarding their assessment. The dispute resolution commission will decide whether (part of) the appeal is justified and makes sure that the assessment is changed accordingly.

### **ANALYSIS AND CONCLUSION (regarding 4.2.)**

Students' progress is monitored systematically and thoroughly. Tools, e.g. Moodle, to show the progress of students are in place. Due to small group sizes, communication is personal and open, allowing teachers and students to receive and give immediate verbal feedback. Students and teachers maintain close, family-like relationships that encourage open dialogue. The feedback is taken seriously and teaching adjusted whenever necessary.

After graduation, the graduates career is followed by surveys, by statistical analysis and by direct contact. It is clear that the VMU takes very good care of the graduates. About two-thirds respond to the surveys, and professors maintain contact with alumni to follow their career progress. Around 85% of the graduates find employment in the private sector, particularly in industrial and research laboratories, while some continue their studies at research institutes or in medical sciences. Alumni can be found working at the Agriculture Institute and various biotechnology companies. The programme also attracts students from other Lithuanian universities, including Kaunas University of Technology, Vilnius University, and Lithuanian Health Science University. The drop-out rate is very low, reflecting strong student motivation. Some graduates have even established their own companies.

Policies to ensure academic integrity, tolerance, and a sensible gender balance are in place. Implementation of these policies is also very well arranged. This framework ensures that all students are treated equally and fair. The procedures for appeal are also very well established as evidenced by the fact that no requirements for rectification or complaints were filed in the last five years.

## AREA 4: CONCLUSIONS

<b>AREA 4</b>	<b>Unsatisfactory - 1</b>  Does not meet the requirements	<b>Satisfactory - 2</b>  Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b>  Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b>  Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b>  Exceptionally well nationally and internationally without any shortcomings
<b>Second cycle</b>				<b>X</b>	

### COMMENDATIONS

1. The learning outcomes and teaching methods are well-adjusted to modern day teaching and supported by digital platforms such as Moodle.
2. Student with physical problems can access the premises of the university without problems. Socially vulnerable students with special needs can determine an own individual learning path and postpone assessments if needed.
3. Students' progress is monitored systematically and thoroughly. Feedback is provided on written examination, results of seminars, and of individual assignments. This stimulates the effectiveness of the students' learning process.
4. Policies to ensure academic integrity, tolerance, and a sensible gender balance are in place. These policies are implemented through regular training sessions for both faculty and students, clear reporting mechanisms for instances of discrimination or harassment, and evaluation that ensures equal opportunities for all students. Appeals and complaints are dealt with efficiently and swiftly.

### RECOMMENDATIONS

To address shortcomings

None

For further improvement

1. The description of the learning outcome in SER Table 1.2 about '*Special abilities*' should be modified as the words "acquire skills" refer to an active process, not a learning outcome or goal.
2. The assessment of the learning outcomes should be AI proof.

3. The panel suggests that AI literacy should be added in the learning outcomes regarding AI literacy to supplement the general guidelines provided by the VMU.

## AREA 5: TEACHING STAFF

5.1.	Teaching staff is adequate to achieve learning outcomes
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### FACTUAL SITUATION

5.1.1. The number, qualification, and competence (scientific, didactic, professional) of teaching staff is sufficient to achieve learning outcomes

Most teachers divide their time between teaching and laboratory work. Teaching is closely integrated with research and consists mainly of face-to-face teaching, preparation for lessons, either in the lab or theoretical, and competence development. About one third of their time is spent on contact hours with the students. If a course is not supported by a lecturer that is qualified, teachers from outside the VMU who are experienced in the topics addressed, will take care of the respective course. The team of lecturers is also supported by two technicians and an engineer who take care of the teaching laboratories. Lastly, the IT management is centrally provided by the information technology department. Online databases and digital resources are available, but the programme's small size limits elective course variety. Moodle is used for materials and communication.

In the current academic year, 5–8 teachers supervised the master's theses. Typically, one student is assigned to each supervisor, and the department recommends that no teacher supervise more than five theses per semester.

The programme has 14 affiliated teachers, all full-time VMU employees. In addition, a few from outside of VMU (in particular, from Thermo-Fischer Scientific) deliver teaching on their special topics in the study programme (SER, p. 52).

The analysis of the changes in the staff during the period of 2021–2025 shows that one out of 14 of teachers of the main group of study courses have changed, *i.e.* the teacher that coordinated 'simulation of biochemical processes'. This course remained in the study plan but is presented by a more experienced teacher.

Promotions depend on academic achievements, teaching experience, and publications. After five years of teaching and active research engagement, lecturers can apply for associate professor positions. Publications, textbooks, and methodological contributions are all part of the evaluation criteria.

The duration of teachers' working hours, as well as the principles for planning, calculating, implementing, and monitoring their workload, are defined by the Description of the Procedure for Calculating VMU Teachers' Workload, approved by the Rector on May 27, 2024, by Order No. 222. For full-time teachers, the average annual workload is 1,584 hours, equivalent to 36 hours per week. A teacher's workload includes contact hours with students, non-contact activities such as lesson preparation, conducting research and experimental development, professional competence development, and organizational responsibilities.

Teachers generally feel comfortable teaching in English as they all have at least a B2 level in English. This is essential for staying updated with the latest developments in biochemistry and for fostering

international collaboration. Language courses are available free of charge, and future classes will be divided between Lithuanian and English depending on group size.

### **ANALYSIS AND CONCLUSION (regarding 5.1.)**

The teaching staff's qualifications are up to par. In addition, the current workload is fine as there were no comments about this. However, the process by which teachers are evaluated should be more clear. Even after thorough questioning during the interviews, it became not clear to which exact pedagogical criteria which are used for this purpose. The general reply was 'years of teaching'. This is not good enough. Tracks specific for teaching should be implemented besides the research-related tracks. The focus should be on specific pedagogical competencies, such as taking care of a positive and safe learning environment, and the ability to interact effectively with students. Criteria for these competencies appear to be missing. It would be good to establish a portfolio to obtain a university teaching qualification (UTQ) or equal certification that can be used internationally (examples from Ireland: University Teaching Qualification - UCD Teaching & Learning, Belgium: University teaching qualification (BKO or UTQ) — Educational glossary, and the Netherlands: University Teaching Qualification | Radboud University) in accordance with the type of teaching that is done, including assessment of the learning outcomes of each course. Lastly, the teaching staff is relatively old, but clear efforts are being made to involve more young researchers in teaching and supervision.

There are challenges in teaching in English. As internationals are permitted in the programme, the teachers may have to give the same course in both Lithuanian and English in the case that Lithuanian students prefer their native language in teaching. In the long run, it would also be natural to have the C1 level as goal for those teachers who give teaching to international students.

5.2.	Teaching staff is ensured opportunities to develop competences, and they are periodically evaluated
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### **FACTUAL SITUATION**

#### **5.2.1. Opportunities for academic mobility of teaching staff are ensured**

VMU teachers have extensive opportunities for international mobility through Erasmus+, with around 260 staff participating annually in teaching visits to over 600 partner universities worldwide, and about 330 attending training visits for professional development. In 2024, VMU joined the Baltic University Program (BUP), a network of over 110 universities promoting education and research, which also provides mobility opportunities. Teachers can further exchange educational views via conferences, seminars, and institutional visits. These exchanges enhance the quality of study programs, benefiting students, faculty, and the university, while enabling teachers to collaborate internationally, participate in projects, and contribute to scientific publications.

During the 2022-2025 period, about 70% of the teachers visited various countries amongst which Japan, USA, and different EU countries. They improved their didactic competencies, gave lectures, and conducted research. Teachers came back with the latest knowledge and methods, that is used to update the content of their courses and integrated in new laboratory work. Furthermore, 11 visiting professors gave open lectures to students, updated them with the latest developments and state-of-the-art technologies.

#### **5.2.2. Opportunities for the development of the teaching staff are ensured**

Professional development is organised in three areas: general (foreign language, management, etc), professional (didactic, subject-related, etc.), and personal competencies (personal development, time management, etc.). "At least 20 hours per year" is recommended for teachers' professional development (SER, p. 54). These can be spent on training activities that are given about eight times per month, free of charge. The recommended amount sounds quite low considering the continuous development of teaching methods, AI and the rapidly advancing study fields. Online courses, such as on Coursera or on the VMU self-learning platform, are also in place, where teachers can access a broad pellet of recordings, e.g. about AI. Besides this, teachers can also participate in educational innovation projects, such as digitalization initiatives and flipped-classroom methods. More than 60% of the teaching staff participated in training events organized by the VMU and 30% of the staff in training through Coursera. Participants gave feedback on their training which was used to identify events that could be useful for other teachers.

The university encourages young researchers to join through research projects and collaborations. An internal motivation system rewards teachers based on their publications and conference participation. Some teachers also work part-time in research institutes or clusters, which helps strengthen the research-teaching connection. Younger staff begin teaching during their PhD studies, often assisting in laboratory courses. All new staff are assigned mentors for pedagogical support.

### **ANALYSIS AND CONCLUSION (regarding 5.2.)**

The composition of the academic staff complies with legal requirements. The student-to-teacher ratio is more than sufficient for individualized work, including the master's theses. The systematic engagement in international academic life ensures professional development. Excellent conditions for academic mobility are also in place. The staff is relatively old, but there is ample attention to integrate younger teachers in the study programme. Teachers can report issues through anonymous questionnaires.

Some laboratory exercises include AI tools, such as protein structure modelling. Teachers encourage students to use these AI tools critically and ethically. One lecturer uses ChatGPT to demonstrate analytical approaches and promote critical thinking rather than cheating.

## **AREA 5: CONCLUSIONS**

<b>AREA 5</b>	<b>Unsatisfactory - 1</b> Does not meet the requirements	<b>Satisfactory - 2</b> Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b> Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b> Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b> Exceptionally well nationally and internationally without any shortcomings
<b>Second cycle</b>				X	

### **COMMENDATIONS**

1. The teaching staff's qualifications are up to par.

2. Clear efforts are being made to involve more young researchers in teaching and supervision.
3. Teachers have at least a B2 level in English and have access to language courses free of charge.
4. AI is already incorporated in the curriculum.

## RECOMMENDATIONS

To address shortcomings

None

For further improvement

1. Time recommended to professional development of teachers ("at least 20 hours") is clearly not enough, the goal should be at least double this amount (corresponding roughly to one week per year).
2. The panel suggests the programme to consider establishing a portfolio to obtain a university teaching qualification (UTQ) according to the type of teaching that is done, including assessment of the outcomes of each course.

## AREA 6: LEARNING FACILITIES AND RESOURCES

6.1.	Facilities, informational and financial resources are sufficient and enable achieving learning outcomes
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### FACTUAL SITUATION

#### 6.1.1. Facilities, informational and financial resources are adequate and sufficient for an effective learning process

The programme's facilities and learning resources demonstrate solid capacity and recent strengthening. The 2024 consolidation within the Faculty of Natural Sciences has improved logistics by bringing lectures and practical work together on the Academy of Agriculture VMU campus, addressing earlier dispersion and enabling smoother organization of teaching and labs. Multiple classrooms and computer rooms support practical and computational needs essential to biochemical analysis.

Practical training benefits from renewed premises and infrastructure; with all lectures and practicals now co-located, the organization of laboratory activities appears effective. Students are satisfied with access to equipment and feel supported in independent investigations, which reflects positively on access policies and staff facilitation. Graduate feedback highlights strong preparation for professional work, encompassing both technical and soft skills, and points to the value of learning across lectures, seminars, laboratory work, and independent tasks.

Students can also use modern laboratories across relevant VMU departments and the Research Institute of Natural and Technological Sciences, gaining hands-on experience by joining faculty research projects, including international initiatives. Opportunities for practical training and internships are further expanded through Erasmus+ and other scholarship-funded mobility programs at foreign institutions. Additional practical placements are available in external research centres and companies with which VMU has cooperation agreements; the Faculty and the Career Centre actively share information about such opportunities.

Low student numbers limit the ability to run electives, reducing exposure to other disciplines and narrowing the educational breadth. Strengthening collaboration with related programmes may help to offer shared electives and practicals, broadening access to facilities and expertise while meeting minimum enrolment requirements.

Digital infrastructure is robust. Students use Moodle for course materials and requirements, supported by a wider ecosystem that enables blended delivery when needed. According to the SER, theses and research outputs are stored in the VMU CRIS repository, ensuring continuity and accessibility of academic work. Library provision covers modern printed and electronic resources across biochemistry and related fields, and the virtual library offers extensive discovery through subscribed databases.

Persons with special needs are enabled through accessible premises (elevators, automatic doors, wheelchair lifts, marked stairs, adapted classrooms, designated library workspaces, and dormitory options). SER indicates that study accommodations are coordinated individually with flexible schedules and adapted assessments. Although no students with special needs have enrolled in this programme to date, staff affirm readiness to implement flexible methods and reasonable adjustments to ensure full participation.

#### 6.1.2. There is continuous planning for and upgrading of resources.

The process of planning and upgrading the resources needed to carry out the field studies is described in the light of changing student and teaching staffs' needs.

Study resources are planned and upgraded annually based on faculty and academy development plans aligned to study needs, with programme study committees preparing infrastructure improvement plans each year. SER states programme's plans to expand financial capacity for maintenance and upgrading of laboratory equipment to boost research activity and student engagement and increase the use of modern teaching technologies and the virtual learning environment to strengthen independent learning.

VMU centrally monitors and updates IT hardware and software, auditing and refreshing software every six months. The renewal of information resources is coordinated with the Library: teachers responsible for study programmes and courses express their needs, while faculty curators within Library analyse publication flows and actively involve academic staff in shaping printed and electronic collections. The formal procedure for forming VMU's Information Resources Fund defines the principles, criteria, acquisition scope, access, fund structure, and monitoring indicators that guide this process.

#### **ANALYSIS AND CONCLUSION (regarding 6.1.)**

Facilities and learning resources are modern and sufficient to support effective delivery of the programme. To strengthen this position, the programme should maintain an annual, prioritized equipment renewal plan informed by student feedback, graduate input, and programme outcomes, and continue expanding modern teaching technologies and virtual resources to complement hands-on training and independent learning. Implementing these measures will preserve resource adequacy and further enhance the educational experience in Biochemical Analysis.

## AREA 6: CONCLUSIONS

<b>AREA 6</b>	<b>Unsatisfactory - 1</b>  Does not meet the requirements	<b>Satisfactory - 2</b>  Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b>  Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b>  Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b>  Exceptionally well nationally and internationally without any shortcomings
<b>Second cycle</b>				<b>X</b>	

### COMMENDATIONS

1. Students report strong access to laboratory equipment and support for independent investigations, indicating effective availability of resources and staff facilitation.

### RECOMMENDATIONS

To address shortcomings

None

For further improvement

1. Low student numbers restrict the offering of electives, limiting interdisciplinary exposure. Working more closely with related programmes could allow shared electives and practical sessions, giving students access to more facilities and expertise while meeting minimum group sizes.

## AREA 7: QUALITY ASSURANCE AND PUBLIC INFORMATION

7.1.	The development of the field of study is based on an internal quality assurance system involving all stakeholders and continuous monitoring, transparency and public information
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### FACTUAL SITUATION

7.1.1. Internal quality assurance system for the programmes is effective

The quality assurance system follows the European, national and university-level guidelines and standards (listed in SER, p 65-66). Implementation of procedures described in the above-mentioned documents is dependent on efficient processes for collecting, analysing and disseminating information on the quality of studies in the programme and active participation of students and social partners (in addition to teachers). Quality of studies is assessed and analysed at University, Faculty and Department levels and in the individual programmes, each with their own roles and responsibilities which are clearly described in SER. At programme level, the key organ for collecting and assessing information, ensuring coherence of the study aims and content of teaching and developing the programmes is the Committee of Biochemical Analysis (Study Programme Committee, SPC) with representatives of teaching staff (9), students (2) and social partners (2). Based on description of the issue in SER and on what the panel learned during the site visit the internal

quality system, established in response to the suggestions in the previous external evaluation, is functional and effective.

#### 7.1.2. Involvement of stakeholders (students and others) in internal quality assurance is effective.

Students have representation at all levels of University administration and thereby have an opportunity to contribute to the development of study and learning processes. At programme level, SPC is the key organ responsible for co-ordinating the internal quality assessment and identifying issues needing updating or improvement. SPC plays a central role also in the implementation of the developmental measures to practice, although formal decisions are made at higher level (e.g., Head of Department, Dean of Faculty, University Senate), depending on the nature and extent of the planned changes. SPC of Biochemical Analysis programme includes two student members and two members representing social partners who also act as information channels between their respective stakeholder groups and the study programme. In addition to SPC, the Faculty/Department/Study Programme organise regular discussion meetings with students, alumni and social partners providing possibility to be informed on and contribute to quality assurance beyond the SPC. In principle, the involvement of students and other stakeholders in internal quality assurance is effective. In practice, however, there is one issue which needs attention. During the site visit, none of the students present in the discussion with the evaluation panel knew the identity of the student members in the SPC, indicating problems in the information flow between the SPC and students.

#### 7.1.3. Information on the programmes, their external evaluation, improvement processes, and outcomes is collected, used and made publicly available

Basic information on the study programme and its external evaluations is published on University website. Detailed information is gathered continuously and systematically on various aspects of teaching and learning processes, alignment of the programme with job market and societal needs, mobility of teachers and students, statistical data on students and studies, measures taken to improve the programme etc. for the purpose of annual internal self-assessment. This information, together with the information on feedback obtained through surveys organized by VMU Study Quality Unit is made accessible to the Head of Department and to SPC. After analysis of the feedback, the survey results are disseminated in a summarized, aggregated form to the relevant stakeholders participating in the surveys via e-mail or targeted meetings. and eventually published on VMU website.

#### 7.1.4. Student feedback is collected and analysed

Feedback surveys targeting students, teachers, graduates and social partners are regularly organized and analysed. An important tool for collecting student feedback is the "Teaching and learning evaluation of the study courses", in which the programme as a whole has received very good grade, between 8.4 and 10 points. Other regular surveys, organised and administered by the University Study Quality Unit, The Faculty or Department are targeting different student groups or stakeholders, e.g., teachers, first year students, students having completed internship, graduating students, alumni, and employers. Unfortunately, the response rates of the study course survey or any of the other surveys are not mentioned in SER, but are likely to be highly variable and often low. As already mentioned in point 7.1.2., students, alumni and social partners have various formal and informal meetings, discussions and other types of interaction with the teachers of the programme, which provide possibilities to comment and make suggestions for the improvement of study quality.

Results of the surveys, generally collected by the Study Quality Unit of VMU and made available to Head of Department, Dean of the Faculty and SPC, who then share the information in aggregated form to teacher(s), students and other stakeholders following the guidelines of the University. Based on the feedback, many changes have been introduced to the programme (e.g., improvements in technical facilities, distance learning possibilities and course information on Moodle pages, feedback on tasks completed by students).

### **ANALYSIS AND CONCLUSION (regarding 7.1.)**

Overall, quality assurance procedures and tools, including collecting feedback in a systematic manner and using the feedback from students and other stakeholders to improve the programme, are functional in the program and meet fully the requirement of an internal quality assurance system in guiding the development and everyday running of the programme. The visibility of the SPC especially to the students is not at a level expected in the light of the critical importance of this organ in the continuous development of studies. More information on the role of SPC in the programme should be given to students, including perhaps newsletters on its latest meetings and decisions. There are also a number of different surveys aiming at the same goal: to gather information on the outcome of teaching. Frequent surveys in the middle of studies, work and other obligations may be a factor which can keep the response rate low. A critical analysis of the performance of the different surveys could identify the most cost-effective and productive (in terms of response rate) ways to carry out the surveys. Possibly, the number of different surveys could be reduced as well.

## **AREA 7: CONCLUSIONS**

<b>AREA 7</b>	<b>Unsatisfactory - 1</b> Does not meet the requirements	<b>Satisfactory - 2</b> Meets the requirements, but there are substantial shortcomings to be eliminated	<b>Good - 3</b> Meets the requirements, but there are shortcomings to be eliminated	<b>Very good - 4</b> Very well nationally and internationally without any shortcomings	<b>Exceptional - 5</b> Exceptionally well nationally and internationally without any shortcomings
<b>Second cycle</b>				<b>X</b>	

### **COMMENDATIONS**

1. The programme has actively introduced changes to teaching and study environment as a result of feedback from students.

### **RECOMMENDATIONS**

To address shortcomings

None

For further improvement

1. The role of the SPC in the program and its visibility to students should be strengthened. Perhaps e-mailed newsletters informing the students (and staff) on latest SPC meetings and related issues and/or face-to-face or remote Q&A sessions with the SPC could be helpful.
2. The panel recommends that the program performs a critical analysis of currently organised multiple surveys in order to improve the response rates and, possibly, to find ways to run the surveys

in the most cost-effective way (in terms of time spent in answering and analysing the results, comparison to other ways of collecting feedback).

## V. SUMMARY

The curriculum of the Master's programme Biochemical Analysis is solid and has a strong foundation in chemistry and physics and clear emphasis on methods, consistent with the title of the programme. The students are invited to join the research groups early in studies, but typically get integrated in research mainly via the Master's Thesis and the preceding mandatory Research Work 1 and 2 projects. The low drop-out rate of the programme, high level of satisfaction expressed by students and alumni and the good communication between students and teachers indicate that the programme takes very good care of its students. The teacher-to-student ratio is exceptionally high, allowing more time for supervision at individual level. The facilities are very good and supportive to the study programme.

There is room for improvement in several areas. The mobility of the students is very low, partly due to financial challenges but also by limitations set by the rather rigid curriculum. The programme should consider all possibilities to increase the support to students' participation in international exchange programs. The alumni and social partners have an important role in linking the programme to the needs and trends in the surrounding society, and the programme should use their expertise more efficiently, for example, by strengthening their role in the development of the programme in the SPC. The volume of elective studies is presently quite small (6 credits, excluding the Master's thesis and the two obligatory research works), especially for a Master's programme, narrowing the possibilities for personalised study plans. Low number of students is a chronic problem and may lead to failure in obtaining the minimum number of participants in some elective courses. In the recruitment and promotion policy of lecturers, more weight should be put on pedagogical merits, especially the use of various new teaching methods to complement the traditional lecturing, instead of only counting years of teaching experience. The programme collects feedback via a number of different surveys to provide information critical for the continuous development of the programme and for identification of areas which need improvement. However, the surveys have variable and sometimes low response rates and the programme consider possibilities to increase the response rates and enhance the efficiency of the surveys. All literacy should be addressed officially on the programme level. That way, lecturers know exactly what or what not to do.

Finally, the panel wants to thank VMU and the study programme for the most welcoming, friendly and open atmosphere and fruitful discussions during the site visit.