



CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

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**EVALUATION REPORT**  
**STUDY FIELD of MATERIALS TECHNOLOGY**  
**AT VILNIUS UNIVERSITY**

**Expert panel:**

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Report language – English

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Vilnius  
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## Study Field Data

Title of the study programme	Light Engineering	Laser Technology
State code	6121FX012	6211FX004
Type of studies	University studies	University studies
Cycle of studies	First-cycle studies	Second-cycle studies
Mode of study and duration (in years)	Full-time studies, 3.5 years (4 years from 2022)	Full-time, 2 years
Credit volume	210 (240 from 2022)	120
Qualification degree and (or) professional qualification	Bachelor's Degree in Technological Sciences. Study field: Materials Technology	Master's Degree in Technological Sciences. Study field: Materials Technology
Language of instruction	Lithuanian/English (English from 2021)	Lithuanian/English
Minimum education required		
Registration date of the study programme	2017-03-28 No. ISAK-499	2007-03-21 No. ISAK-499

Title of the study programme	Photonics and Nanotechnology	Pharmaceutical Chemistry
State code	6211FX003	6211FX020
Type of studies	University studies	University studies
Cycle of studies	Second-cycle studies	Second-cycle studies
Mode of study and duration (in years)	Full-time, 2 years	Full-time, 2 years
Credit volume	120	120
Qualification degree and (or) professional qualification	Master's Degree in Technological Sciences. Study field: Materials Technology	Master's Degree in Technological Sciences. Study field: Materials Technology
Language of instruction	Lithuanian/English	Lithuanian
Minimum education required		
Registration date of the study programme	2007-03-21 No. ISAK-499	2018-06-01 No. SV-10

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# I. INTRODUCTION

## 1.1. BACKGROUND OF THE EVALUATION PROCESS

The evaluation of study fields is based on the Methodology of External Evaluation of Study Fields approved by the Director of the Centre for Quality Assessment in Higher Education (hereafter – SKVC) 31 December 2019 Order [No. V-149](#).

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

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

On the basis of this external evaluation report of the study field SKVC takes a decision to accredit the study field either for 7 years or for 3 years. If the field evaluation is negative, then the study field is not accredited.

The study field and cycle are **accredited for 7 years** if all evaluation areas are evaluated as exceptional (5 points), very good (4 points) or good (3 points).

The study field and cycle are **accredited for 3 years** if one of the evaluation areas was evaluated as satisfactory (2 points).

The study field and cycle are **not accredited** if at least one of evaluation areas was evaluated as unsatisfactory (1 point).

## 1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure (hereinafter referred to as the Procedure) as approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 [Order No. V-149](#). The visit to the HEI was organised on the 22<sup>nd</sup> of November 2022.

### 1.3. GENERAL INFORMATION

The documentation submitted by the HEI follows the outline recommended by SKVC. Along with the self-evaluation report and annexes, the following additional documents have been provided by the HEI before, during and/or after the site visit:

No.	Name of the document
1.	Documents about the internal quality system (after expert's request)
2.	VU Regulations: Description of recognition of Prior Learning, Description of the Procedure for crediting Learning outcomes, regulations on the procedures, for the re/appointment of academic and (art) research staff
3.	Final Thesis for the years 2019, 2020, 2021, 2022
4.	Some student survey results
5.	some data about employability (Medžiagų technologijos)
6.	Some study programme committee reports
7.	Study course descriptions
8.	VU LRC Technology 20221121.pdf
9.	A letter of the Head of SER group.

### 1.4. BACKGROUND OF THE STUDY FIELD/STUDY FIELD POSITION/STATUS AND SIGNIFICANCE IN THE HEI

Vilnius University (hereafter - VU) (1579) as a public university is the oldest and largest higher education institution (HEI) in Lithuania. VU has 15 core academic units (hereafter -CAUs) - 11 faculties, 1 institute, 1 centre, 1 academy and 1 business school) and 12 core non-academic units. On January 1st, 2022, VU employed 2355 teaching staff, 740 - researchers, and 2322 - administrative and technical staff; 24716 students studied at VU.

The study programmes (hereafter -SPs) under evaluation, the 1st-cycle programme Light Engineering, and the 2nd-cycle - Photonics and Nanotechnology, and Laser Technology, are operated by the Faculty of Physics (hereafter – the Faculty). The 2nd-cycle programme, Pharmaceutical Chemistry, is operated by the Faculty of Chemistry and Geosciences.

During the last years, from 2018 to 2020, the Faculty of Physics revised SP because of the recommendations of previous evaluations, students', and social partners' feedback, as well as due to societal and legislative changes. In line with two other SPs, the title and aim were changed for the SP Photonics and Nanotechnology (former title: Materials and Technologies of Optoelectronics). In addition, the language of instruction has been changed from Lithuanian to Lithuanian/English for 2 second-cycle SPs under evaluation: Photonics and Nanotechnology, and Laser Technology. Also, in 2021, the Light Engineering programme has been revised, the language of instruction has been changed to English only, and the scope in credits and the length of the SP has been changed from 210 credits and 3.5 years to 240 credits and 4 years. These changes started in 2022 admission.

The 1st cycle SP Light Engineering was accredited in 2017 for 5 years, and the 2nd cycle SP Pharmaceutical Chemistry was accredited in 2018 for 5 years as new intended to be implemented SPs. The SP Photonics and Nanotechnology (former Materials and Technologies of Optoelectronics) and Laser Technology were previously accredited in 2016 for 6 years.

## II. GENERAL ASSESSMENT

**Materials Technology field study and first cycle at Vilnius University (VU) is given positive evaluation.**

*Study field and cycle assessment in points by evaluation areas*

No.	Evaluation Area	Evaluation of an Area in points*
1.	Intended and achieved learning outcomes and curriculum	4
2.	Links between science (art) and studies	4
3.	Student admission and support	4
4.	Teaching and learning, student performance and graduate employment	5
5.	Teaching staff	4
6.	Learning facilities and resources	5
7.	Study quality management and public information	4
	Total:	30

\*1 (unsatisfactory) - the area does not meet the minimum requirements, there are fundamental shortcomings that prevent the implementation of the field studies;

2 (satisfactory) - the area meets the minimum requirements, and there are fundamental shortcomings that need to be eliminated;

3 (good) - the area is being developed systematically, without any fundamental shortcomings;

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

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

**Materials Technology field study and second cycle** at Vilnius University (VU) is given **positive** evaluation.

*Study field and cycle assessment in points by evaluation areas*

<b>No.</b>	<b>Evaluation Area</b>	<b>Evaluation of an Area in points*</b>
1.	Intended and achieved learning outcomes and curriculum	3
2.	Links between science (art) and studies	3
3.	Student admission and support	4
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	4
6.	Learning facilities and resources	5
7.	Study quality management and public information	3
	<b>Total:</b>	<b>26</b>

\*1 (unsatisfactory) - the area does not meet the minimum requirements, there are fundamental shortcomings that prevent the implementation of the field studies;

2 (satisfactory) - the area meets the minimum requirements, and there are fundamental shortcomings that need to be eliminated;

3 (good) - the area is being developed systematically, without any fundamental shortcomings;

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

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

## **II. STUDY FIELD ANALYSIS**

### **3.1. INTENDED AND ACHIEVED LEARNING OUTCOMES AND CURRICULUM**

***Study aims, outcomes and content shall be assessed in accordance with the following indicators:***

*3.1.1. Evaluation of the conformity of the aims and outcomes of the field and cycle study programmes to the needs of the society and/or the labour market (not applicable to HEIs operating in exile conditions)*

As stated in the SER (p.9), the aims and outcomes of the SP included in the study field Materials Technology, are formulated corresponding to the Lithuanian Qualification Framework (Government of the Republic of Lithuania Resolution No. 535, 15/05/2015) , Descriptor of Study Cycles (Order No V-1012 of the Minister of Education and Science (MoES), 11/16/2016) and the description of the Technology study fields group (Order No V-922 of Lithuanian MoES, 08/27/2015 ).

In detail aims and outcomes are formulated in Appendix No.1. As stated in the SER (page 10), each SP has unique objectives in accordance with the industry branch and technology needs. The aims of study programmes briefly are mentioned:

Bachelor's SP Light engineering - development and training of practical technological and engineering skills, necessary to work in industrial enterprises connected with lasers, laser technology, modern lighting, photovoltaics, photonics, and semiconductors.

Master's SP Laser Technology - training of specialists in lasers and laser technology, providing expertise in 1) technological processes used for the design and production of laser and optical components and optical coatings, 2) advanced ultrashort pulse laser systems and laser micromachining techniques used in the manufacture of high-tech products, 3) ways and means how laser systems are used for organising and carrying out product development and production processes; as well as possessing a deep understanding of the areas of laser-matter interaction and laser technologies, and being able to design new laser products, build innovative laser systems and carry out independent research in various areas of laser technology.

Master's SP Photonics and Nanotechnology - training highly qualified, international-standards-meeting experts in photonics and nanotechnology with in-depth knowledge of photonics, optoelectronics, semiconductor physics, nanotechnology, and measurement techniques.

Master's SP Pharmaceutical Chemistry - training of specialists in chemistry, biochemistry or closely related disciplines, contributing to drug development in the pharmaceutical industry; providing professional skills to work in industrial companies that develop, produce, investigate, and/or supply pharmaceutical products or research institutes or to continue their studies in doctoral programmes in chemistry, biochemistry, biotechnology or medical sciences. It was stated in the SER (p.14) that "the Pharmaceutical Chemistry programme is unique among similar programmes as it largely focuses on the in-depth understanding of the molecular basis of drug action and design rather than application, validation, and control issues of already existing substances. The study programme is assembled from modules dedicated to fundamental aspects relevant to bioactive substances, their production and quality assessment coupled with specific topics dedicated to law, validation and regulatory procedures currently used in the pharmacy industry worldwide. Each module stands on its own and therefore, students with a diverse background in natural or life sciences can apply for this programme."

The SPs in the laser technology and photonics field are well-adjusted to the needs of the labour market. This is backed by the survey of independent business organisation LINPRA in 2019, showing a critical need for an increase in the number of graduates in engineering and related fields for the development of the local industry. The labour market in the past three years has expanded significantly, exceeding the number of graduates and, subsequently, justifying the need for such programmes. The programmes give an excellent opportunity in the market, with



a possibility of gaining high-level positions or else continuing their research in PhD studies. In addition, based on SER, both Faculties have a solid connection to the local labour market and a great understanding of its tendencies, thus, guiding the study programmes accordingly.

In addition, however, the study field also includes Pharmaceutical Chemistry SP which is realised by the Faculty of Chemistry and Geosciences and is more related to chemistry and biochemistry. The focus of this SP is not very well defined and it seems not to be related to Materials Technology.

The title, the study aims, and the intended learning outcomes of Pharmaceutical Chemistry SP should be rethought, as the focus of the SP is more related to (Bio)Analytical Chemistry, not to Pharmacy, as “the names of programmes should be clear, not misleading, and linked to the intended learning outcomes of the field of study (fields of study).”<sup>1</sup>

### *3.1.2. Evaluation of the conformity of the field and cycle study programme aims and outcomes with the mission, objectives of activities and strategy of the HEI*

As stated in SER (p. 11), the study field’s aims and learning outcomes are arising from the mission and objectives of Vilnius University as defined in the Statute of Vilnius University (VU). The Materials Technology study field contributes to several VU objectives, like conducting research of a high international level and encouraging students of all study cycles also participate therein, the unity of scientific research and studies, aimed at forming a creative, critical, responsible, and continuously developing personality; to train competent, erudite scientists (researchers) and other highly qualified specialists. The study field also helps (SER, p. 12) “Foster the role and significance of science, study, knowledge, and innovations in the development of society “.

It was stated in the SER (p.12) that the prime motivation for the establishment of a new 2nd-cycle Pharmaceutical Chemistry SP in 2018 was to respond to the constantly growing demand for qualified personnel in the life sciences sector and to strengthen the Materials Technology study field at VU.

In 2020, Lithuania’s biotechnology sector grew by almost 87% in terms of revenues, life sciences sector grew - by 22.1% between 2011 and 2016.

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<sup>1</sup> In accordance with the Order of the Minister of Education and Science of the Republic of Lithuania No. V-1075 of 01-12-2016 "On the Approval of the List of Fields of Study and Groups of Fields of Study in Higher Educational Institutions, the Procedure for Changing the List of Fields of Study, the Framework of Qualification Degrees, and the Principles of Titles of Degree Programmes" *Švietimo ir mokslo ministro 2016-12-01 įsakymu Nr. V-1075 „Dėl studijų krypčių ir krypčių grupių, pagal kurias vyksta studijos aukštojoje mokykloje, sąrašo, jo keitimo tvarkos, kvalifikacinių laipsnių sąrangos ir studijų programų pavadinimų sudarymo principų patvirtinimo“*

In 2019, the World Economic Forum recognised Lithuania as the best place for R&D in Central and Eastern Europe, and the capital Vilnius is one of the fastest-growing innovation hubs in Europe.

SPs related to lasers and photonics are in coherence with the strategy of the Vilnius University and responds to the increasing needs of laser technology and photonics industry. However, for the SP Pharmaceutical Chemistry, it is not clear what are the ties and links with the study field Materials Technology. There are also study programmes in Lithuania and VU, related to a pharmacy that are realised by other faculties and included in the field of Health Sciences (like the Faculty of Medicine of the Vilnius University realises a 5-year SP "Pharmacy" SP (Health Sciences - G05 Pharmacy field study)).

In addition, the programme aims, and outcomes of Pharmaceutical Chemistry SP didn't fit well with the mission and strategy of the HEI, as the focus should be on Analytical Chemistry and not in the pharmaceutical field.

### *3.1.3. Evaluation of the compliance of the field and cycle study programme with legal requirements*

The first and second cycle study programmes are performed in compliance with the Description of Study Cycles (Order No. V-1012 of the Minister of Education and Science of the Republic of Lithuania, 2015) and the Description of General Requirements for the Provision of Studies (Order No. V-1168 of the Minister of Education, Science of the Republic of Lithuania, 2016) and Descriptor of the Study field of Technological Sciences (Order No V-922 of the Minister of Education and Science of the Republic of Lithuania of 27 July 2015).

In VU, ECTS credit system is applied, where 1 study credit point corresponds to 25–30 work hours of a student that are composed of contact and self-study hours planned by the lecturer and approved by the SPC. (SER, p.17). All SPs under evaluation are composed of course units or modules of 5 or 10 credits, according to the VU regulations. The Faculty of Physics has set 1 credit point as 28 hours of student workload for all SP. The Faculty of Chemistry and Geosciences has not such general regulation, and the student workload is planned by the lecturer and approved by the SPC. In all course units in Pharmaceutical Chemistry, 1 credit measures 27 hours of student workload (SER, p.17).

Table No. 1. Compliance of the program Light Engineering with the general requirements for first cycle study programs.

<b>Criteria</b>	<b>Legal requirements</b>	<b>In the Programme</b>
Scope of the programme in ECTS	180, 210 or 240 ECTS	Yes
ECTS for the study field	No less than 120 ECTS	Yes

ECTS for studies specified by University or optional studies	No more than 120 ECTS	240, from 2022
ECTS for internship (practice)	No less than 15 ECTS	Yes
ECTS for final thesis (project)	No less than 15 ECTS	Yes
Contact hours (including distance contact hours)	No less than 20 % of learning (unless otherwise stated in the descriptor of study field)	Yes

Table No. 2. Compliance of the program Laser Technology, Photonics and Nanotechnology and Pharmaceutical Chemistry with general requirements for second cycle study programs.

<b>Criteria</b>	<b>Legal requirements</b>	<b>In the Programme</b>
Scope of the programme in ECTS	90 or 120 ECTS	Yes
ECTS for the study field	No less than 60 ECTS	Yes
ECTS for studies specified by University or optional studies	No more than 30 ECTS	Yes
ECTS for final thesis (project)	No less than 30 ECTS	Yes
Contact hours (including distance contact hours)	No less than 10 % of learning (unless otherwise stated in the descriptor of study field)	Yes

SPs are in accordance with the requirements of the regulations of Lithuanian laws for higher education. However, the composition of the study field raises questions about why SP Pharmaceutical Chemistry is included in the study field Materials Technology.

#### *3.1.4. Evaluation of compatibility of aims, learning outcomes, teaching/learning and assessment methods of the field and cycle study programmes*

The Study plans of the SP for the 2021 study admission year are shown in Appendix No. 2. of the SER. In these plans, the total student workload in contact hours and individual work hours is given, the coordinating teacher is identified, and the relations between the course results and the competences and the learning outcomes of the SP are shown. A detailed description of the study courses was provided as additional material.

In general, the coherence of the aims and learning outcomes of study programmes is presented, and they are synchronised with the study and assessment methods.

### *3.1.5. Evaluation of the totality of the field and cycle study programme subjects/modules, which ensures consistent development of competences of students*

The Faculty of Physics currently has three SPs in the Materials Technology field: one 1st cycle SP: Light engineering SP, and two - of 2nd level. The creation of technology SPs was mainly motivated by the fast-growing (10-25 % per year) laser industry in Lithuania. The Light Engineering SP was created because of the signals from the industry representatives, claiming the theoretical nature of the Faculty of Physics SPs (SER, p.12).

The Faculty of Chemistry and Geosciences has one 2nd level SP (Pharmaceutical Chemistry) that was launched in 2018.

The curricula of the master-level programmes in the laser technology and photonics field are focused on deeper acquiring knowledge and skills in the main subject rather than developing interdisciplinary higher-level soft skills. In discussion with the social partners, quite different wishes of interested employers were expressed - starting from readiness to recruit second-year students, to the need for graduates with PhD. Several employers expressed the opinion that a bachelor's degree in a Lasers or Physics related field is not enough, which means that the Faculty of Physics is thinking in the right direction by offering both bachelor's and master's degree SPs.

In the discussion with students, the concern was voiced that in the case when the same study courses are included both, in the Bachelor and Master levels, the content is the same especially when the responsible lecturer is the same.

Regarding the Pharmaceutical Chemistry SP, there is only one subject (Pharmacodynamics and Pharmacokinetics) fully related to the Pharmaceutical Sciences and therefore it isn't sufficient at all to give competences related to Pharmaceutical Chemistry. By the way, one of the graduates mentioned that the contents of this subject should be reinforced. This issue was also raised in the previous external assessment, which mentioned that there was a lack of involvement of professors from the field of pharmacy.

### *3.1.6. Evaluation of opportunities for students to personalise the structure of field study programmes according to their personal learning objectives and intended learning outcomes*

As stated in the SER (SER, p. 22), in VU students are provided with a range of opportunities to personalise their studies: there is a possibility to make an individual study plan, made together by the students and the faculties study consultant, and approved by the SPC, they can participate in the exchange, they must choose the location and topic for the internship, as well as a research project.

Elective courses in 1st cycle 15 ECTS, in the second cycle Laser Technology only 5 ECTS from two proposed courses (p. 23, SER) during the 3rd semester, Photonics and Nanotechnology - 5 ECTS, 1st semester; in the second cycle Pharmaceutical Chemistry, there are four elective courses in the programme. In the 1st semester students can choose one elective course (5 ECTS) from the three offered. In the 2nd semester students can choose one course (5 ECTS) out of four and in the 3rd semester students have the opportunity to study 2 elective courses (10 ECTS) from four offered. "Optional courses allow a purposeful deepening of knowledge in technology, chemistry, or biochemistry according to the individual needs of each student". (SER, page 21). Pharmaceutical Chemistry students can also build individual study plan (SER, page 23).

In the discussion with students, the opinion was expressed that the easiest and most common form for individualising studies is creating individual plans, which are approved by the SPC. This possibility is often used also when students are willing to participate in another study course or switch the lecturer.

### *3.1.7. Evaluation of compliance of final theses with the field and cycle requirements*

The preparation of final theses is set by the Regulations for the Preparation, Defence, and Storage of Research Papers of Students Studying at VU approved by the VU Senate, and the Procedure for Administering Research Papers in the VU Study Information System approved by the Vice-Rector for Studies of VU. The faculties have their specific requirements for final thesis preparation and defence related to the specifics of the particular study fields (SER, p. 23). These documents can be found on the web sites of faculties, as well as Final thesis evaluation criteria are also presented in the description of the Final Thesis course unit.

Students at the Faculty of Physics choose their topics at the beginning of the final semester, while at the Faculty of Chemistry and Geosciences, the preliminary topics are being chosen at the beginning of studies.

The quality of the final thesis mainly in the laser-related fields is very high. The final thesis of SP Pharmaceutical Chemistry is related more to analytical chemistry.

#### ***(1) Strengths:***

1. The support of the laser technology and photonics industry for laser- and physics-related study programmes is significant.
2. The material base for the realisation of the study field is excellent.

#### ***(2) Weaknesses/Aspects for improvement of the evaluated area:***

1. Including the study programme Pharmaceutical Chemistry in the study field of Materials Technology is unfounded (the content of the SP with the title of the programme and field of study - is more oriented to analytical chemistry).
2. According to the opinion of social partners, the total number of graduates is lower than the needs of the industries in this field.

### 3.2. LINKS BETWEEN SCIENCE (ART) AND STUDIES

*Links between science (art) and study activities shall be assessed in accordance with the following indicators:*

*3.2.1. Evaluation of the sufficiency of the science (applied science, art) activities implemented by the HEI for the field of research (art) related to the field of study*

As Vilnius University is a leading scientific research institution in the country in Natural and Technological sciences, its research potential is also exploited in Materials Technology field study programmes. A high number of researchers make significant scientific contributions in the form of conference presentations and peer-reviewed paper co-authorships.

The latest evaluation in 2018 has given very high scores to the Materials Science UoA (Table 2.1, SER page 27). Also, the results of annual evaluations of research in the Natural sciences and Technological sciences fields by faculty (Table 2.2, SER page 27) are rather high. The total number of publications is very high; however, it is presented in general for Natural and Technological sciences fields related to the study field in the years 2018-2020 (Table 2.3., SER page 28). Separation of physics and materials technology R&D is very hard, often impossible, but this also results in noticeable overestimation of the indicators originating from the study field only.

The same difficulty arises in the judgement over the number and quality of scientific projects belonging entirely to the study area (Appendix 5 of SER). The total number and volume of research projects is very good, but the topics reach over the whole spectrum of physics and chemistry.

It is interesting to mention that there is only one Lithuanian patent application per year, only 1 licensed patent, 7 EU patent applications, 2 USA patents from 2018 -2020 (Table 2.3., SER, page 28). The Faculty of Chemistry and Geosciences has no Monographs, considerably fewer publications, and no patent application in the mentioned period. Since the SF of Materials Technology is a technological field and is claimed to be close to the industry and patenting is crucial for the innovation and commercialisation of the invention, the low number of patents may show a weakness of the intellectual property system at the University.

*3.2.2. Evaluation of the link between the content of studies and the latest developments in science, art and technology*

Courses taught in the Materials Technology study field program use the latest literature, and relevant information regarding the newest scientific knowledge and technological innovations; the detailed description of links for both first and second cycle is analysed in detail (SER, page 31-33).

There is a clear and strong link between the content of studies and the scientific activities performed, for the Light Engineering and Laser Technology study programmes. High level of research projects led by the teaching staff of the study field naturally results in high level and actual lecture courses and studies. Intense business field and ecosystem of the Lithuanian laser sector guarantees the corresponding novelty level in teaching and vice versa.

### *3.2.3. Evaluation of conditions for students to get involved in scientific (applied science, art) activities consistent with their study cycle*

Students are mainly involved in presenting their research in conferences. A smaller fraction of them is employed/paid from research grants (Table 2.5, SER page 34).

From their very first days at VU students are introduced to participate in scientific activities in both the Faculty of Physics and Faculty of Chemistry and Geosciences. The students are involved in conducting scientific activities integrating different research projects. They organise annually an international scientific conference (called “Open Readings”; SER page 33).

The research activities of the students are in addition encouraged by industrial partners as personal fellowships to encourage their research activities.

The student involvement in scientific activities and research training seems very good. Indicators in SER seem to be wrongly interpret as employed persons and persons involved in research projects (Table 2.5, SER page 34). In additional material sent by the self-evaluation team, it was made clear that Table 2.5. shows the “Number of students employed in the grant-funded research projects”, as well as the “Number of students who attended LRC-funded research internships”. With that putting emphasis on the fact that students are actively involved in the research work as a part of curricula. But still, based on data from SER following conclusions emerge: The number of student’s publications is quite low. The number of students employed in the grant-funded research projects/research internships should be improved. The motivation of the students to work in science in the future could be limited if no employment is present.

However, it was told in the meetings with the self-evaluation team that the number of students, employed in the research projects, is higher than presented in Table 2.5 but it is difficult to track their employment in other structural units. The previous evaluation recommended “enhancing the data collection and monitoring of student research activities”, and we observed that the same problem is in place also now.

#### ***(1) Strengths:***

1. The level of research performed in the Materials Technology field is very high.
2. The academic staff being deeply involved in the research is of high level.



3. The graduate students are actively trained and involved in research activities as a part of the curricula.

***(2) Weaknesses/Aspects for improvement of the evaluated area:***

1. The link between the content of studies of the Pharmaceutical Chemistry study programme and the scientific activities performed is weaker than in other second cycle programmes.
2. The system of tracking of students' involvement in scientific activities is not well developed.

### **3.3. STUDENT ADMISSION AND SUPPORT**

***Student admission and support shall be evaluated according to the following indicators***

***3.3.1. Evaluation of the suitability and publicity of student selection and admission criteria and process***

The admission requirements are properly defined for Lithuanian and EU/EEA residents and the other for third-country entrants, in a separate way.

Regarding the Lithuanian and EU/EEA residents, the admission for the first-cycle study programmes is carried out using LAMA BPO (Association of Lithuanian Higher Education Institutions for Organisation of General Admissions) and the students are admitted to the study programme based on their admission grades. For admission to the second-cycle programmes, the procedure is the responsibility of the University, where there is also an admission grade based on a defined formula.

Information about application conditions is publicly available on the websites of the University, the Faculties operating the field study programmes, LAMA BPO, and other websites/means.

Most of the students in both first and second-cycle programmes have signed study agreements in state-funded places.

The admission process is corresponding with Lithuanian law and is conducted as needed. The information regarding the requirements to apply for the study program is also provided on the webpage of VU.

There is data concerning the admission process in the past that is taken into consideration.

***3.3.2. Evaluation of the procedure of recognition of foreign qualifications, partial studies and prior non-formal and informal learning and its application***

There are defined procedures for the evaluation of foreign qualifications and there was a significant number of requests during the evaluation period. Some cases of recognition of partial studies were also reported. Regarding procedures of recognition of competences acquired informally and/or through self-education were not observed in the last three years.



The recognition of prior learning is conducted based on the right that is granted by the ministry. Each case is evaluated on a case-by-case basis. During the study visit we didn't receive any negative feedback on the current system. VU has a document on which prior learning is evaluated and seems to be in working order.

### *3.3.3. Evaluation of conditions for ensuring academic mobility of students.*

There is a central International Relations Department at the VU and also some staff at the two faculties to manage studies abroad and international cooperation. The students have the possibility to do international mobility under different programmes. Student visits for Erasmus internships are organised and administered by the Student Services and Career Department. It is also reported that VU recently became part of ARQUS network, and it is envisaged that international opportunities would increase. Furthermore, information about mobility opportunities is given on the websites of the University and the Faculties, by newsletters to the University community, and during periodical meetings.

There are some full-time foreign students enrolled in different study programmes.

The number of incoming students is appreciable (average of 5 students for both 1<sup>st</sup> and 2<sup>nd</sup> cycle in 2020-2021, SER page 44). However, the number of outgoing students is rather low, especially for the first cycle (2 students in 2020-2021 – SER page 43).

Even though the university has a wide range of international partners, it doesn't seem that there are enough opportunities for students to go on exchange programs based on partnerships with similar institutions abroad, especially in this particular study field.

### *3.3.4. Assessment of the suitability, adequacy and effectiveness of the academic, financial, social, psychological and personal support provided to the students of the field*

The students have different types of support. The academic support is provided by the Student Services and Career Department, which gives the students counselling about their studies. This department also helps in professional development through training courses and functions as a bridge to the labour market. The students can receive scholarships for their achievements, may also apply for social grants, and have help regarding their accommodation in University dormitories. Furthermore, the students can use the facilities of the VU Health and Sports Centre, have the possibility to enjoy the activities promoted by the Culture Centre of VU and receive psychological counselling in the Counselling and Training Centre.

Vilnius University has a vast range of different support mechanisms in place for students to receive grants, scholarships, psychological and academic support. Although in the meeting with students it has been stated that not all the opportunities are known by students. Despite this fact, during the meeting with teachers, it has been mentioned that they provide consultations and assistance for students who need additional support.

### *3.3.5 Evaluation of the sufficiency of study information and student counselling*

News students are introduced to their study programmes during VU integration week, where they meet the study programme committees and the different departments of VU.

Information about the studies is always provided on several levels: general information about the study process through the Student Services and Career Centre, while information specific to academic units is provided in the study departments of the Materials Technology study field academic units, and in individual meetings with academic consultants and lecturers. The Students Representation also provides information to students.

All information related with the study process is also provided to students in VU academic units: in study departments and during meetings with vice deans of studies, heads of study programme committees and academic consultants. Information is constantly provided by e-mail and is available on the websites of the faculties.

Information about the study process is also provided to students through Vilnius University Study Information System (VUSIS).

Vilnius university uses a few different systems in its intranet for different services. The infrastructure is quite admirable for literature and books, and all the study materials are presented via Moodle and some other tools. Although it might seem that having the information on a single platform would be more beneficial as some students mentioned that they get lost among the information on different platforms and sometimes it is difficult for them to find needed information.

#### ***(1) Strengths:***

1. The students have different programmes of support, from different points, as academic, financial, social, and psychological ones.

#### ***(2) Aspects for improvement of the evaluated area:***

1. Attraction of foreign students still should be improved, especially full-time students.
2. Students should be better informed about various scholarships.

## **3.4. TEACHING AND LEARNING, STUDENT PERFORMANCE AND GRADUATE EMPLOYMENT**

***Studying, student performance and graduate employment shall be evaluated according to the following indicators:***

*3.4.1. Evaluation of the teaching and learning process that enables to take into account the needs of the students and enable them to achieve the intended learning outcomes*

The qualification of research and teaching staff corresponds to their current position, staff must undergo evaluation every five years. The considered criteria are published research articles, conference attendance, research supervision, teaching, published teaching materials, participation in the doctoral studies process, student research supervision, expert,

organisational, and other research activity. Student feedback on the work of the evaluated teacher is also considered. The course unit satisfaction survey allows the Faculty to take the student's feedback into account more objectively.

Regarding achieving intended learning outcomes, in both first- and second-cycle programmes, a significant part of the study process consists of laboratory work, included in many study subjects. During the courses, teachers from industrial backgrounds participate in the programme.

Most academic staff members offer supervision of final theses, research projects or internships for students of first and second-cycle programmes.

At the end of each semester, all students are asked to provide feedback on the course units and teachers of the semester. The results of the survey are accessible to the teachers themselves, the Study programme committees, and the administration of faculties. The summaries of all students' responses are provided to the commission of the Selection and Evaluation of Teaching and Research Staff and are considered during the evaluation of teaching staff.

In the case when students' reviews of a teacher are constantly and highly negative, the Study programme committee and vice-dean for studies of the faculties discuss the reasons for student's dissatisfaction with the teacher. The goal of these discussions is to find ways to change the situation.

Lecturers use different methods for teaching and provide different opportunities for students to reach the needed learning outcomes. There are descriptions of the evaluation system in each subject and there is some interaction with the labor market during the studies for students to better understand the plausible outcomes of their studies. There are students who take part in scientific studies even at the bachelor level which allows them to get a grasp on future possibilities even closer.

#### *3.4.2. Evaluation of conditions ensuring access to study for socially vulnerable groups and students with special needs*

The ability for vulnerable groups to take part in the studies is based on the adaptation of the University environment, providing a possibility to use compensatory technical measures, organising seminars and other events addressing the disabilities for the University community, counselling students and lecturers on study accessibility issues, providing a possibility to study according to individual needs. Students can also receive professional psychological counselling, financial support. There is also a special scholarship for students from socially vulnerable groups.

The information is accessible on the VU website, in case of illness academic leave (up to 2 years).

Students with disabilities have the possibility to study in Materials Technology study field programmes. The faculties are not yet fully adapted to accommodate students with movement disabilities. Due to the narrow passages, and the hard-to-reach layout of equipment, students with movement disabilities might encounter difficulties accessing laboratories.

The university has a Procedure for Adapting studies to Individual needs arising from disability, that enables the tailoring of the study process to the needs of students and unclassified students with special needs.

VU has a broad range of support systems for vulnerable groups. Although what raises a few issues is that during the meeting with teachers it has been mentioned that they haven't taken part in learning courses themselves on how to work with students with special needs.

Regarding inclusion in the academic community, the university has a coordinator which works on the integration process towards the community, there are events that are targeted towards vulnerable groups to include them in the University community.

#### *3.4.3. Evaluation of the systematic nature of the monitoring of student study progress and feedback to students to promote self-assessment and subsequent planning of study progress*

The progress of all the students of a specific year is monitored by the University Study Administration department. The grades are monitored, and if there are repeating tendencies, the results of student performance evaluation are discussed with the administrative staff of the corresponding Faculty and with the study programme committees.

The Student Services and Career Department monitors the student drop-out levels. Students who fail one or more exams during the exam session and have to retake an exam receive informational letters about various options of exam retaking, various forms of training and counselling on how to prepare for a retake.

No detailed monitoring of student results during the semester is undertaken at the programme level. The faculties' philosophy is that students must be treated as adults who are responsible for their own progress; the default mode of addressing problems is between the student and the instructor.

Throughout the teaching and learning process, students are provided with feedback on their achievements. This ensures consistent and in-depth learning that would enable students to achieve maximum progress when studying a course unit (module) while also enabling the student to express their personality and talent.

Providing individual feedback is the responsibility of teachers and there are no specific regulations on it.

Teachers organise the provision of feedback in different ways and ensure that continuous feedback is always present. Therefore, a wide variety of ways to give feedback to students exists in the faculties. The feedback is typically provided after each study assessment, such as homework, presentation, interim or final exam, etc. Feedback is also always provided after specific study activities, such as laboratory works, group works, seminars or exercises. It is usually given orally and sometimes in writing. When giving feedback, teachers always first concentrate on general issues to discuss with all students as a group. Students can also always receive individual feedback on their performance from the teacher on a request basis.

During the meeting with students, it was mentioned that they receive adequate feedback regarding their performance in a certain subject. As well there are centralised systems that monitor students' progress and have the possibility to provide additional support if it seems needed.

#### *3.4.4. Evaluation of employability of graduates and graduate career tracking in the study field.*

VU provides data about the employability of the graduates. This data is given both by a Career Tracking Information System (CTIS) and the sociological surveys by the University itself. To career tracking, subjective data are requested one, three, and five years after the examination. The SER indicates a very good rate of employment. According to VU data, around 90–100% of second-cycle graduates of 2018–2020 of Materials Technology field studies are working on a contractual basis/or are self-employed or working and continuing studies one year after graduation. About 30% of graduates continue their studies as well.

The general in-person feedback from the graduates is very positive; the comment from the social partners confirms the need for Material technology graduates.

The employment of graduates of SP Pharmaceutical Chemistry is high, however, it seems to be not directly in the pharmaceutical market.

#### *3.4.5. Evaluation of the implementation of policies to ensure academic integrity, tolerance and non-discrimination*

Students and staff must adhere to the Academic Ethics Code of Vilnius University which defines general academic, teaching, study, and scientific research ethical norms. The Code defines cases of cheating, plagiarism, fabrication, bribery, and illegal assisting of another in dishonest academic activity. VU Study Regulations stipulate those students who have violated academic ethics may receive a notice or be expelled from the University.

There are internal policy papers that are targeted toward adhering to academic integrity during the study process. Although there haven't been many cases that were analysed in the study field it is hard to say whether the measures taken if such misconduct happens is difficult to evaluate.

The University also has an equality coordinator which works towards a tolerant and non-discriminatory academic community which seems to be the case.

#### *3.4.6. Evaluation of the effectiveness of the application of procedures for the submission and examination of appeals and complaints regarding the study process within the field studies*

The appeal lodging procedure is determined by the Regulations of the Dispute Resolution Commission of Core Academic Units. People who disagree with the examination procedure or evaluation can file a complaint with the Appeals Commission of a Faculty within 5 days after the publication of examination results. A decision of an Appeals Commission regarding evaluation is final, while a decision regarding the examination procedure can be contested by the Vilnius University Dispute Resolution Committee.

During the study visit, we haven't encountered any situations regarding the appeal system.

##### ***(1) Strengths:***

The University is implementing initiatives towards including vulnerable groups in the community.

##### ***(2) Weaknesses:***

The Pharmaceutical Chemistry SP comprises a CU Technological Practice in a Pharmaceutical Company, but the settings to perform these internships are not clear and furthermore, the link with Pharmaceutical Industry is very poor.

### **3.5. TEACHING STAFF**

#### ***Study field teaching staff shall be evaluated in accordance with the following indicators***

##### ***3.5.1. Evaluation of the adequacy of the number, qualification and competence (scientific, didactic, professional) of teaching staff within a field study programme(s) at the HEI in order to achieve the learning outcomes***

High percentage of very qualified academic staff is involved in teaching. All teaching staff have a doctoral degree. From the Faculty of Physics, 54% of full Professors (total number 50), 30% of Assoc. professors/researchers (77) and 6% of Assistant professors/researchers (53) are active in this study field. From the Faculty of Chemistry and Geosciences those numbers are slightly lower, accordingly 32% (28), 28% (33), and 8% (27) (Tables 5.2 and 5.3, SER page 65).

The average ratios of lecturers to students in the study field are 0.23 and 0.47 for the first cycle and second-cycles SPs, respectively (Table 5.1, SER, page 64).

There is a special attention to include in the teaching staff professionals with industrial background.

According to the results of the survey of the academic staff of both Faculties, 100% of the teaching staff of the programmes under evaluation declare that they know English language at least at the B2 level (SER, page 66).

Table No. 3. Materials Technology field lecturers' compliance with the requirements for the first cycle studies

<b>Requirement stated in Description of General Requirements for the Provision of Studies</b>	<b>In the <i>Light Engineering</i> study program of the first cycle</b>
No less than 50% of the first-cycle university level subjects of study must be taught by scientists/researchers or renowned artists (art subjects).	Yes

Table No. 4. Teachers meet the general requirements for the second cycle studies

<b>Requirement stated in Description of General Requirements for the Provision of Studies</b>	<b>In <i>Laser Technology, Photonics and Nanotechnology and Pharmaceutical Chemistry</i> study programs of the second cycle</b>
No less than 80% of all study subjects teachers must have a scientific degree (or be renowned artists)	yes
The remaining share (20%) of teachers may be practitioners who, in the period of recent 7 years, have gained at least 3 years of experience in professional activities which correspond to the taught applied subjects.	Yes
No less than 20% of major study field subjects' volume has to be taught by teachers occupying the position of a Professors	yes

It seems that a rather small fraction of academic staff (Table 5.3) is involved in teaching (Table 5.2, SER, page 65). Apparently, the active staff members frequently change the fractions of their positions of teaching/research duties specified in their current contracts (Appendix 11 of SER). The qualification of teachers is generally higher for programs from the Faculty of Physics than from the Faculty of Chemistry and Geosciences.



The teaching staff allocated to Pharmaceutical Chemistry SP are mainly from the Chemistry field.

### *3.5.2. Evaluation of conditions for ensuring teaching staffs' academic mobility (not applicable to studies carried out by HEIs operating under the conditions of exile)*

The teaching staff have different possibilities to perform international mobility (e.g. Erasmus + grants), where 70% have participated at least once (SER, page 68). Besides that, all teaching staff participated in scientific conferences or other events in Lithuania and abroad. In addition, there were some teachers from abroad that participated in ERASMUS teaching visits.

Most of the staff members frequently visit local and international conferences and take part in the international mobility system (Appendix 11 of SER). There are also regular lectures and seminars given by international visitors (Appendix 12 of SER).

In general, the teaching staff understands the importance of taking part in international mobility experiences and they are motivated to improve the numbers as they recognized it as positive drivers of pedagogical and scientific parts.

There seems to be no functional or routine sabbatical leave system at place (suggested already by the previous evaluation team).

### *3.5.3. Evaluation of the conditions to improve the competences of the teaching staff*

There is a Centre of Education Competences (established in 2017) with the aim to develop and improve teaching and educational competences of the academic staff (SER page 68). The Centre offers training courses aimed for different groups of teachers. Since the Centre is funded by VU, the participation of academic staff is free of charge. The adherence to the courses promoted by the Center of Education Competences is not the expected. It is mentioned in SER (page 69) that the teachers of the Faculty of Physics are not very active to participate in the courses for raising their qualification. The same impression the experts got during the meeting with the academic staff - recently, only one younger teacher was participating in such courses. The situation was worsened due to the need to switch to distant learning in 2020 when nearly all members of academic staff, involved in teaching, participated in online courses organized by the University's Information Technology Service Centre and Centre of Educational Competences to be able to provide online classes.

#### ***(1) Strengths:***

1. The academic staff is with a high research experience.

#### ***(2) Weaknesses/Aspects for improvement of the evaluated area:***

1. There is insufficient integration of business/industry representatives into the study process (e.g. Pharmaceutical Chemistry SP).
2. The sabbatical leave system is almost absent and very weak.



3. There is not enough motivation of academic staff to take part in further training courses to improve educational competencies.

### 3.6. LEARNING FACILITIES AND RESOURCES

*Study field learning facilities and resources should be evaluated according to the following criteria:*

*3.6.1. Evaluation of the suitability and adequacy of the physical, informational and financial resources of the field studies to ensure an effective learning process*

The study programmes under evaluation are separated between the two faculties of Vilnius University. The Light Engineering, Laser Technology, and Photonics and Nanotechnology programmes are primarily based in the Faculty of Physics, while the Pharmaceutical Chemistry programme is based in the Faculty of Chemistry and Geosciences. Accordingly, the following paragraphs will first consider each separate, then also the facilities that are accessible to the studies of both.

Currently, the Faculty of Physics occupies three separate buildings. It contains over 15 lecture rooms at the main location, Saulėtekis Ave., and several lecture rooms in the Laser Research Center and the National Center for Physical Sciences and Technology. More so, the teaching process involves modern and fully equipped 20 teaching laboratories and 14 research laboratories, which are freely accessible to the students. In addition to the lecture rooms and teaching laboratories, Material technology students gain access to state-of-the-art scientific laboratories to gain practical experience and conduct research for their final thesis. They are also supported by access to some of the typical software used in research and studies, such as MS office 365, MATLAB, OriginLAB, etc. Furthermore, they can use computer classes and VU HPC supercomputer, if necessary, for their studies and research.

The Faculty of Chemistry and Geosciences is located on a separate campus, Naugarduko str. 24. The Faculty provides 10 well-equipped lecture rooms and 9 teaching laboratories. These lecture rooms are used by all the teaching programs in the Faculty. All classrooms are equipped with modern multimedia equipment. In addition, there are several research laboratories at the National Center for Physical Sciences and Technology, Saulėtekis Ave., that are also freely accessible to the Pharmaceutical Chemistry students to conduct their thesis work or research outside of the curricula.

Students of both Faculties can access Vilnius University Scientific Communication and Information Center (SCIC) which provide state-of-the-art library functionality for study material such as books and periodicals that are stored and operated 24/7. The SCIC involves students and teachers in updating their resources (though students could be better informed of this opportunity).

Students can also access databases and other electronic materials subscribed by the university. The list of electronic databases subscribed by Vilnius University for the Material Technology study field includes but is not limited to American Physical Society (APS), Science, and Nature journals. Furthermore, Vilnius University is subscribed to a list of electronic book collections, and they have an ongoing activity of digitization of books. The overall list of the subscribed electronic material seems to be sufficient for the first- and second-cycle studies.

In response to COVID-19 both Faculties quickly adjusted to the remote/hybrid environment for teaching and consulting students. The Faculty of Physics even developed lab kits for some first-cycle lab work to be performed at home. All teachers are using Moodle-based virtual learning environments and/or Microsoft Teams for education, both being essential during the pandemic.

The resource infrastructure accessible to the students of the Material technology field is of the highest standards. The total capacity of the rooms exceeds the number of students in the first- and second-cycle studies. The library maintains the highest standards, and state-of-the-art research laboratories are open for both first- and second-cycle students.

There is a concern that the laboratories are focused on general or analytical chemistry rather than pharmaceutical; see further comments on the programme in “3.1 Intended and achieved learning outcomes and curriculum”, but the laboratories themselves are well-equipped for teaching and research purposes. In addition, the overall list of the subscribed electronic material seems to be sufficient for the first- and second-cycle studies.

Despite that all teachers are using the aforementioned Moodle-based virtual learning environment, there could be a more systematic approach to what documents and how are uploaded. Also, the websites in the native language endure more information than in English; thus, this could be reviewed considering the need for international students.

### *3.6.2. Evaluation of the planning and upgrading of resources needed to carry out the field studies*

Each teaching laboratory in the Faculty of Physics has a supervisor and is supported by a particular department. The Faculty repairs the rooms annually to keep the teaching facilities fully serviceable and allocates 250 EUR/year/lab for restocking consumables. Also, some equipment uninstalled from the scientific laboratories is reused in the teaching laboratories. In addition, the Faculty has an 8000 EUR/year fund that is used for some additional expenses beyond usual and is administered by the dean's office.

The supervisors of the laboratories discuss their proposal for the upgrade/renovation of some set-ups with the vice-dean for studies. Their plan for further improvement of the facilities is relatively modest, thus showcasing the very good conditions that are already established; see the detailed discussion on the planning and upgrading of resources in Section 3.6.2. In the last 4 years (2018 – 2022), the Faculty of Physics had spent ca. 39100 EUR for the refurbishment of the facilities.

Similarly, to the Faculty of Physics, the Faculty of Chemistry and Geosciences was consistent with developing and refurbishing its facilities and teaching material. In the last 4 years (2018 – 2022), the Faculty of Chemistry and Geosciences has spent over ca. 63000 EUR for the refurbishment of the facilities, incl. the establishment of a completely new classroom.

The University has remained consistent with the development and refurbishment of its facilities and teaching material over the years. The investments planned are focused on the refurbishment of the facilities, while minor changes are implemented as well, with students and teachers involved in the process. While not all of the students are aware of the opportunity to contribute to the planning of the resources, this does not seem to negatively impact the student-oriented plans.

***(1) Strengths:***

1. State-of-the-art laboratories are freely accessible to both BSc and MSc students.
2. Facilities are larger than currently needed; thus, there is a potential for a higher number of students.

### **3.7. STUDY QUALITY MANAGEMENT AND PUBLIC INFORMATION**

***Study quality management and publicity shall be evaluated according to the following indicators:***

#### ***3.7.1. Evaluation of the effectiveness of the internal quality assurance system of the studies***

The internal quality assurance system of VU has been developed in the frame of the project “The Development and Implementation of an Internal Study Quality Assurance System at Vilnius University”, as stated in SER (p. 79). The system is based on the ESG (Standards and Guidelines for Quality Assurance in the European Higher Education Area). According to the additional information, currently VU is updating the Study Quality Manual. The Working Group established by the vice-dean is created for the update of the Study Quality Manual. According to this decree, the Quality Manual must be completed by 31 August 2023. Additionally, the description of the Procedure for Organising Feedback from Social Stakeholders on Improving Study Quality at Vilnius University (2 documents LT and EN) has been provided.

For the quality of SPs, special Study programme committees (SPC) are responsible, and regulated by “the Regulations of the Study Programme Committee of Vilnius University”. According to this, SPC should report to faculty councils about the implementation of the programme at least once a year; the report should include problems, changes, future plans, etc. Changes, after discussion in SPC, are approved by the Faculty Council.

In addition to the SER, some yearly report summaries of the 3 SP were provided for the Photonics and Nanotechnology, Light Engineering, and Pharmaceutical Chemistry, as well as a

more detailed protocol of the meeting of the study committee of the master's program "Laser technology" from February 25, 2021, Protocol LT PSK no. 1/2021.

The structure and decision-making procedures are described, and additional documents have been submitted. However, the official document describing the entire internal quality assurance system "Study Quality Manual" is still under review and will be ready only by 31 August 2023. The preparation of such an important document should be hastened.

One of the main bodies responsible for SPs is SCPs. Some of the provided SPC yearly reports seemed to be very short and formal and did not contain all the above-mentioned required information.

It is interesting to mention that in the self-evaluation team nobody from the central departments of the university was present, giving the impression that the evaluation of the field of study is only a Faculty level business.

### *3.7.2. Evaluation of the effectiveness of the involvement of stakeholders (students and other stakeholders) in internal quality assurance*

As stated in SER (p.80) all major stakeholders are involved in the decision-making regarding the Materials Technology field. Each SPC has at least one representative from social partners. Social partners are also working closely with the Faculties as every SPC has at least one social partner. Most often, the contact between the social partners and the faculties is kept through its researchers who have personal contacts with industry representatives. Also, sometimes social partners deliver particular subjects or offer teachers that could teach those subjects.

Although each SPC contains a representative of the industry, it is not clear by what criteria it is selected. For example, in the case of the SP Pharmaceutical Chemistry in discussions with the SER team and social partners, the Thermo Fischer company was mentioned as one of the largest companies where graduates of this program work, but the representative of this company is not involved in the work of SPC.

Thus, the relations and involvement of the respective industries and employers in SP improvement should be more systematic and formalised not only based on personal contacts but also using formalised and systematic ways like regular formal industry surveys about different aspects of study programmes.

There are different student surveys organised by the central Study department of VU but it seems that these surveys are not always helpful for taking real decisions at the level of Faculty and SPC. The SPC is taking decisions mainly based on direct student claims and discussions, and proposals rather than on the results of the surveys. In this way, the possibilities of this mechanism are not fully exploited. This point was raised also in the previous evaluation.

### *3.7.3. Evaluation of the collection, use and publication of information on studies, their evaluation and improvement processes and outcomes*

The administration and teaching staff of the Faculty use the VU Study Information System (VUSIS), which serves as the base of information about the management of the field study programmes. The part “Study programme administration” can be accessed by any person with access rights (vice-dean for studies, study administrator, etc.) and can be used to compose, review, and edit study programme plans. Student-relevant documents are prepared using this system.

Some room for improvement was identified in the work (for example, proper documentation) of the study programme committees. Some of the provided SPC yearly reports seemed to be very short and formal.

### *3.7.4. Evaluation of the opinion of the field students (collected in the ways and by the means chosen by the SKVC or the HEI) about the quality of the studies at the HEI*

Twice per study year (at the end of each semester), VU conducts a centralised survey of first- and second-cycle students (surveys are done using the VU online survey system, which is integrated into VUSIS). Subject surveys are conducted during the semester. Detailed survey results about particular faculties and study programmes are published in the “Feedback” section of the VU internal website (intranet). SER says that the results of the surveys can be divided into two periods – before and after the COVID-19 break out. It was mentioned in the SER, that during the pandemic, especially at its beginning, concerns regarding various aspects of remote teaching were raised. Due to the lack of opportunities for in-person communication and disturbances in the schedule, some of the students felt disconnected during remote teaching.

In addition, the results of student surveys were provided in Lithuanian. Some of the survey examples provided showed quite critical views on some SP (for example, Light engineering). Many respondents would not recommend this study programme to others. Since the SP was realised in English, there were comments that the English knowledge of the teaching staff is not good enough to provide a qualitative teaching process. In discussions with the SER team, it was voiced that the leadership of the Faculty knows this problem, and actions were taken. But in general, it is not clear who is doing the summarising and analysis of the survey results and what actions are being taken to correct the situation. In the SER (p. 84) it is stated that results from the recent surveys tend to be either positive or staying at a high level but this statement is not based on documents. The student survey system, especially what concerns the summarising of the results and taking actions should be improved, and made more efficient. Student survey system also should be provided in English, taking into account the internationalisation of the SPs.

Also, the previous evaluation team recommended improving the student survey protocol, feedback, and influence on future modifications (Laser Technology). Maybe there is some progress, but it still needs improvement.

***(1) Strengths:***

The good personal connection of staff of the Faculty of Physics with the laser related industry.

***(2) Aspects for improvement of the evaluated area:***

1. The Study Quality Manual is still under the development.
2. The potential of student and employers' involvement in the improvement of study quality not fully used.

## IV. EXAMPLES OF EXCELLENCE

**Core definition:** Excellence means exhibiting exceptional characteristics that are, implicitly, not achievable by all.

- Excellent infrastructure for research and studies.
- Modern library.
- Deeply in the research involved highly qualified academic staff.

## V. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	1) The title, the study aims, and the intended learning outcomes of Pharmaceutical Chemistry study programme should be rethought/reformulated, as the focus of this programme is more related with (Bio)Analytical Chemistry. This recommendation should be implemented before submitting Progress report 2) At the same time SP Pharmaceutical Chemistry needs to be rethought fitness of the study programme within the Study field of Materials Technology since the focus of the programme belongs more to Chemistry (or after reformulating - Pharmacy) but in both cases not to Materials Technology. This recommendation should be implemented before submitting Progress report 3) The link/cooperation between the central departments and the Faculty level in the internal quality should be enhanced or made visible (for example, including responsible persons about quality, data collection, etc. from the central University level departments in the self-evaluation process and team).
Links between science (art) and studies	4) Data collection and monitoring of student's research activities needs to be further enhanced. 5) The number of students employed in the grant-funded research projects/research internships should be improved. 6) An intellectual property system should be improved at the University, creating a motivation, and ensuring the support for the academic staff to increase the number of patent applications.
Student admission and support	7) The outgoing student mobility should be improved. 8) More efforts should be devoted for students' attraction both local and international. 9) Information for students regarding different scholarships should be promoted more intense.
Teaching and learning, student performance and graduate employment	10) It is necessary to involve pharmaceutical chemical and pharmaceutical companies in the development of the Pharmaceutical Chemistry programme (in case of further development of SP).



Teaching staff	<p>11) In case of further development of the Pharmaceutical Chemistry SP, the teaching staff allocated to SP needs to involve professors from the field of Pharmacy.</p> <p>12) Create the motivation and increase the number of staff participating in the acquisition of educational competences (through the Centre of Education Competences and Erasmus+ programmes).</p> <p>13) Consider the possibility to expand the sabbatical leave system.</p>
Learning facilities and resources	<p>14) Continue to improve the information of online/electronic material for English-spoken international students, including the University/ Faculty websites.</p>
Study quality management and public information	<p>15) The Internal Quality Assurance system must be approved as soon as possible, including a clear system of taking into account students and employers' feedback.</p> <p>16) The student survey system needs to be improved in order to exploit its full potential, for example allowing teachers to add their own questions in questionnaires and organising the centralised summarising of results to facilitate the work of SPCs, etc. Repetitive concerns from the students on certain lecturers should be considered of key importance.</p> <p>17) The involvement of the respective industries and employers in SP improvement should be more systematic and formalised.</p> <p>18) The content and actions beyond the study programme committee reports need to be improved.</p>

## VI. SUMMARY

### **Main positive and negative quality aspects of each evaluation area of the Materials Technology study field at Vilnius University:**

During the visit, the experts got a very positive impression about the Faculty of Physics of Vilnius University. It was first justified by the new premises and impressive scientific infrastructure, as well as with a state-of-art library. Meetings and discussions with representatives of the laser-related and photonics industry completely excavated the rationale for opening and maintaining the direction of materials technology at a classical University. The involvement of the academic staff in high-level research should also be praised. In discussions with motivated and smart students, experts were convinced of the high quality of the work of the Faculty.

From the outside looking in, experts did not get confidence that the decision to include Pharmaceutical Chemistry in the study field of Materials Technology was justified because of the reasons - firstly, pharmacy in Vilnius University and other Universities is included in another study field, and secondly, programme itself contains a problem with the inconsistency of title, aims and content.

As a field for improvement, international outgoing mobility still can be mentioned, creation of the motivation for the academic staff to participate in the acquisition of educational competences, and finally attracting more students, both national and international, since more specialists are urgently needed for the development of the relevant industry sector.

Finally, we express our gratitude to Vilnius University, all involved administration, especially the vice-dean for studies, members of the self-evaluation team, academic staff, and students for all the efforts in organising the process of the self-assessment, quick reactions to the expert's request for additional information, and smooth and excellent organising of the evaluation visit.

**Expert panel leader**

**Prof. Dr. Gita Rēvalde**