CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of BIOTECHNOLOGY

at Vilnius Tech University (Vilnius Gediminas Technical University)

Expert panel:

1. **Prof. Dr. Vinod Kumar (panel chairperson),** *academic;*
2. **Prof. Dr. Ruth Shimmo,** *academic;*
3. **Prof. Dr. Gintaras Valinčius,** *academic;*
4. **Mr. Rimantas Tuskevičius,** *representative of social partners;*
5. **Mr. Daniel Šematovič,** *students' representative.*

Evaluation coordinator – *Mr. Gustas Straukas*

Report language – English

Vilnius
2022

Study Field Data

Title of the study programme	***Bioengineering***	***Bioengineering***	***Nanobiotechnology***
State code	6121FX011	6211FX017	6211FX018
Type of studies	University studies	University studies	University studies
Cycle of studies	First	Second	Second
Mode of study and duration (in years)	Fulltime (4 years)	Fulltime (2 years)	Fulltime (2 years)
Credit volume	240	120	120
Qualification degree and (or) professional qualification	Bachelor of Technology sciences	Master of Technology sciences	Master of Technology sciences
Language of instruction	Lithuanian and English	Lithuanian	Lithuanian and English
Minimum education required	Secondary education	Bachelor‘s degree	Bachelor‘s degree
Registration date of the study programme	1997-05-19	1999-04-23	2011-05-24

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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 (SER) prepared by Higher Education Institution (HEI); 2) site visit of the expert panel to the HEI; 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 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 is evaluated as satisfactory (2 points).

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

1.2. EXPERT PANEL

The expert panel was assigned according to the Experts Selection Procedure as approved by the Director of Centre for Quality Assessment in Higher Education on 31 December 2019 Order No. V-149. The site visit to the HEI was conducted by the panel on *19th of May, 2022.*

Prof. dr. Vinod Kumar (panel chairperson) Senior Lecturer in Microbial Technology and Biorefining, School of Water, Energy and Environment, Cranfield University, Cranfield MK43 0AL, United Kingdom'

Prof. dr. Ruth Shimmo, professor in Tallinn University, Tallinn University, School of Natural Sciences and Health, Professor*;*

Prof. dr. Gintas Valinčius, professor in Vilnius University, Life Sciences Centre (GMC);

Mr. Rimantas Tuskevičus, *social partners' representative, director at "SatiMed";*

Mr. Daniel Šematovič, *final year student of Molecular Biology at Vilnius University;*

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.	-

1.4. BACKGROUND OF PUBLIC ADMINISTRATION FIELD STUDIES AT VILNIUS TECH UNIVERSITY (VILNIUS GEDIMINAS TECHNICAL UNIVERSITY)

Vilnius Gediminas Technical University (formerly abbreviated as VILNIUS TECH) is a state higher education institution. It is a legal entity acting as a public body. The founder of the University is the Seimas of the Republic of Lithuania. It is one of Lithuania's largest higher education institutions, aiming to become a technical and engineering studies and research leader in the Baltic States. The goals of VILNIUS TECH are as follows: to educate qualified, creative and socially active professionals who would be able to work successfully in both the Lithuanian and foreign labour markets, conduct international research, concentrate research activities in the highest competence research units and implement a policy of attracting recognized researchers; to create research-based innovations for society and business, to become a leader of the Baltic universities in the fields of sustainable construction and environment, transport, information technology and communication science; to promote the sustainable development of the country and the region and to develop an innovative society. The University consists of faculties, departments, research and teaching laboratories, scientific and academic institutes and centres, a library, a publishing house, administrations and other departments. The regulations of the units determine the purpose and competence of the University units.

Vilnius Tech is a University with a technical profile; therefore, engineering studies predominate. The University conducts studies in 29 fields in the following study groups: Engineering, Informatics, Mathematics, Technology, Social Sciences, Humanities, Business and Public Management, Arts. Three study programs in the field of Biotechnology of Technological Sciences are running at the VILNIUS TECH. The first cycle studies in the field of Biotechnology have been carried out since 1994. Two-second cycle study programs are currently running. The study program Bioengineering has been running since 1998, and the study program of Nanobiotechnology started in 2011. Total graduates from the field of Biotechnology studies

are as follows: I cycle Bioengineering - 645, II cycle Bioengineering - 179, II cycle Nanobiotechnology - 65. The research field of Technology, Chemical Engineering (T005) and the research field of Natural Sciences Biochemistry (N004) are related to the Biotechnology study field, as evidenced by the publications of the lecturers of the Department of Chemistry and Bioengineering.

II. GENERAL ASSESSMENT

Biotechnology study field and **first cycle** at Vilnius Tech 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	3
3.	Student admission and support	3
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	3
6.	Learning facilities and resources	4
7.	Study quality management and public information	3
	Total:	**24**

*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.

Biotechnology study field and **second cycle** at Vilnius Tech 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	3
2.	Links between science (art) and studies	3
3.	Student admission and support	3
4.	Teaching and learning, student performance and graduate employment	4
5.	Teaching staff	3
6.	Learning facilities and resources	4
7.	Study quality management and public information	3
	Total:	**23**

*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.

III. 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)

The programme addresses the needs of the labour market and society; it is very much aligned with the strategic goals of Lithuania as they are outlined in a number of recent strategic documents, including Smart Specialisation programme as well as the plan for the development of the Life sciences industry.

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

In 2021 Vilnius Tech issued its 10 years Strategic plan outlining major virtues of activities at Vilnius Tech. Vilnius Tech emphasises that the major factor which can implement and realise those virtues is the academic community of the university. The major virtues which the university adhered to in implementing the university strategic goals (called in the Strategic plan as "heights" are: creativity, sustainability, innovation, involvement and openness. The 4 major strategic goals (heights) are – every student is constructing his/her educational experience, every partner is receiving knowledge based advanced solutions, every alumni creates value for the society, and university is an international point of destination for talents, business and society.

The SER does not directly address the question how those university virtues are being implemented in the study programmes at both first and second cycles of education, though there are issues mentioned below on the necessity to increase possibilities for wider involvement of students towards designing their curriculum, especially in the second cycle of education. From the material presented in SER it is obvious that the faculty and the department is contributing significantly towards achieving the strategic goals of the

University, specifically, implementing studies in such a way that students are capable of actively participating in constructing their experience in these studies.

In conclusion, the expert panel would consider the study programmes as being in accord with the strategic mission and objectives of Vilnius Tech University.

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

The tables below are reflecting the compliance of study programmes with legal requirements:

Table No. 1 Study Programme's *Bioengineering* compliance to general requirements for *first cycle study programmes*

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	180, 210 or 240 ECTS	240
ECTS for the study field	No less than 120 ECTS	168
ECTS for studies specified by University or optional studies	No more than 120 ECTS	54
ECTS for internship	No less than 15 ECTS	15
ECTS for final thesis (project)	No less than 15 ECTS	18
Contact hours	No less than 20 % of learning	39%
Individual learning	No less than 30 % of learning	>30%

Table No. 2 Study Programmes' ***Bioengineering*** compliance to general requirements for *second cycle study programmes*

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	90 or 120 ECTS	120

ECTS for the study field Information Services	No less than 60 ECTS	84
ECTS for studies specified by University or optional studies	No more than 30 ECTS	6
ECTS for final thesis (project)	No less than 30 ECTS	30
Contact hours	No less than 10 % of learning	18%
Individual learning	No less than 50 % of learning	82%

Table No. 3 Study Programmes' ***Nanobiotechnology*** compliance to general requirements for *second cycle study programmes*

Criteria	Legal requirements	In the Programme
Scope of the programme in ECTS	90 or 120 ECTS	120
ECTS for the study field Information Services	No less than 60 ECTS	84
ECTS for studies specified by University or optional studies	No more than 30 ECTS	6
ECTS for final thesis (project)	No less than 30 ECTS	30
Contact hours	No less than 10 % of learning	18%
Individual learning	No less than 50 % of learning	82%

The expert panel concludes that the legal requirements for all programs are met.

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

The first cycle programme "Bioengineering" aims to educate Bachelors of Bioengineering equipped with the fundamental knowledge in microbiology, biochemistry, cell biology, genetic engineering, biological systems modelling and biochemical engineering, who can apply the theoretical knowledge to solve practical problems. According to SER, the expected outcomes of the first study cycle are knowledge and understanding (ZS), technology analysis (TA), research (T), technology activities (TV) and personal skills (Annexes 3 and 4, from the SER). According to the "Description of the technology field study programmes" (Executive order of the Minister of Education and Science of Lithuania, 2015-08-27, No. V-922) the graduates of the first cycle study programmes should among others also have skills in technology design (part 12.4) of technological processes. We miss this point in both SER and Annexes provided to the expert group.

This aspect of the requirements for the Biotechnology field studies is better addressed in the second cycle programmes "Bioengineering" and "Nanotechnology". The technological design block of outcomes, which are absent in analogous description of expected study outcomes for the first cycle program, here is included and covered by a number of study subjects.

In general the declared aims of all 3 study programs and expected outcomes are similar to the ones in universities across Europe and worldwide. Aims of the studies and learning outcomes, as well as learning methodologies and assessment methods in general are consistent and logically interconnected as it is explained and justified in SER and Annexes. However, in our opinion, the undergraduate course should be updated so that the aims of the study and expected outcomes would match the requirements of the executive order No. V-922, chapter III, paragraph 13.

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 study programme of both the first cycle is developed based on the general requirements of the aims and expected outcomes of the biotechnology field programs. The structure and the ratio between mandatory and elective courses is well balanced and oriented towards providing a strong natural sciences oriented background for students. We note that the emphasis on acquisition of practical skill is clearly seen (Annex 4) and this is by all means a strength of the programme. Nevertheless, the nature of the Bioengineering programme

implies acquisition of basic knowledge of the bioprocess design, major principles of production, the scale-up, automation, material and heat transfer principles, as well as production in a controlled environment, including GMP standards.

The programmes of the 2nd cycle seem more consistent and well-balance towards the technology and engineering subjects, they have a wide pallet of subjects related to the design and modelling of bioprocesses, which is a strong advantage as one may expect for highly specialised programme such as Bioengineering. However, the presence of two similar (by content) technology programmes is redundant. Despite earlier expert group recommendations to increase nanotechnology oriented subjects in Nanobiotechnology, the programme still is heavily loaded with the same subjects as they are in the second cycle Bioengineering programme. Quite unexpected that the Stem cell biology module of both programmes is tied to the mandatory course work. One studying in the Nanobiotechnology programme would expect to have some coursework related to nanotechnologies. Modern nanotechnologies cannot be understood without basics in molecular and supramolecular forces and self-assembly principles. Also, there is a wide plethora of nanotechnology specific experimental and technological methodologies especially related to imaging techniques. None of these important subjects in our opinion is presented to students in detail, instead, clear duplication of biological subjects in those two second cycle programmes are evident.

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

The first cycle Bioengineering programme has a considerable amount of opportunities for students to personalise the structure of their studies. This primarily refers to elective courses related to general education modules such as language and social sciences/humanities (Annex 2). In total 27 credits out of 240 can be collected by students as either elective courses (15 credits) or free choice (12 credits). Given the fact that first cycle programmes are oriented towards a more general educational background in biotechnology (bioengineering) such levels of choices seem quite reasonable.

In the second cycle programmes the elective and free choice courses comprise 12 credits (annex 2). While such a low level of personalisation is not in conflict with the legal acts, however, it may be considered as being in contradiction to Vilnius Tech strategic plan, according to which students are regarded as active participants that are constructing their

own learning experiences. All this means that the masters' degree seeking students have limited possibilities to personalise their study programme.

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

With few exceptions most of the final projects can be classified as projects related to the field of Biotechnology (bioengineering) and/or Nanotechnologies. The variety of themes seem impressive. This probably can be explained by the fact that many supervisors have their primary job positions at other Lithuanian research institutes, such as Vilnius University (Life Sciences Center and the Faculty of Chemistry and Geosciences), National Cancer Institute, Center for Innovative Medicine. Obviously, these supervisors offer their expertise and thematic specifics to the programme. In this regard, the wide field of final projects is obviously a clear advantage to students, who may significantly expand their technological erudition as well as practical skills.

Taken together, we may consider the options for the final thesis at Vilnius Tech as fully compliant with the field requirements as well as the requirements related to the study cycles.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Good compliance with the strategic goals of the country as well as the Strategic plan of Vilnius Tech.
2. Very good options and a great variety of final projects which are compliant with the specifics of the field.

(2) Weaknesses:

1. Missing study subjects related to the requirements to provide skills in technology design;
2. Fragmentation of the second cycle study programmes, duplication of the study subjects with many aspects for Nanobiotechnology not covered by study modules (self-assembly, bioimaging, nanotechnology processes).
3. Few options for the second cycle students to personalise their curriculum according to their personal objectives and expected outcomes.

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

The academic staff who is teaching on both curricula are involved in research activities are involved in externally funded projects (e.g. Modern thermal insulating materials containing waste compounds with low susceptibility to microbial degradation), publish in international journals ((Angewandte Chemie International Edition, Foods, etc), belong to international committees. The research activities are mandatory for all teachers and researchers. Teachers holding a doctoral degree have to devote about 1/3 of their working hours to the research. A bonus system (reflected in salary) is created to support involvement in research.

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

The curriculum is linked to the latest scientific and technological achievements through the personal competence of the teacher (Self-evaluation report). It is clear that a competent teacher is able to convey his/her knowledge but it is not clear in what way and during what courses that knowledge is transferred. It is not evident how the quality of the scientific knowledge transfer is measured or secured.

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

Both 1st and 2nd cycle students can perform their internships in Vilnius Tech laboratories and in different companies. Some of the students are claimed to be co-authors of published papers. The student involvement in projects and teaching is clearly one way to get them involved in scientific activities. Yet it is not ensuring access to everyone. The mechanism of how students get involved is not described.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The academic staff is involved in externally funded projects and publish in high-rank academic journals
2. A bonus system is supporting involvement in research.
3. The students can have internships in companies and some of them are involved in research projects and co-author international publications

(2) Weaknesses:

1. It is not evident how the quality of the scientific knowledge transfer from staff to students is measured or secured
2. The mechanism of how students get involved in research projects is not described.

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

Admission to the first and second cycle studies are depicted by national and University regulations. Admission to the first cycle is carried out by Lithuanian higher education admission system LAMA BPO. The information about the study programmes and the admission process is available on the website of Vilnius Tech. Number of Masters' study programmes admission numbers are stable for the past few years but the expert panel has the opinion that the number of second cycle students should be increased and needs to be higher. Both study programmes should find a strategy on how to reach potential applicants. Not taking into account the dropping number of admission number, the panel can conclude that the admission criterion are clear and understandable for applicants.

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

Foreign, formal, non-formal, and informal competencies can be recognized in Vilnius Tech, however any regulations of recognition procedure cannot be found in the website of

Vilnius Tech. The panel finds the recognition a standard procedure and cannot make any recommendations to the Vilnius Tech.

3.3.3. Evaluation of conditions for ensuring academic mobility of students

Students of Vilnius Tech have an opportunity for academic mobility according to the Erasmus + programme and other partnerships. They can study abroad and participate in various internships. Students participating in academic mobility can receive scholarships that help students to take these opportunities. However, according to the self-evaluation report the gap between I and II cycle study programmes could be seen as a percentage of II cycle is pretty low comparing to I cycle study programme, therefore, the II cycle study programme committee should work on a strategy how to make Master's studies more international (including mobility, attracting more international students, or international lecturers).

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

Vilnius Tech provides a tutorship opportunity for the groups of students, helping them with academic problems; they also receive financial, psychological and other support. The University provides opportunities for career development of students, however, during the evaluation meeting with students it was noticeable that students lack knowledge about their further career perspective. Therefore, it is advisable to focus more on consulting students about career queries. On the bright side, first year students are met with the Freshman's Guide publication, which provides all the necessary information for first year students in both languages: Lithuanian as well as English. Vilnius Tech should discuss the possibilities of how to promote their students' support services, so they can reach more students; and how to encourage students to use these services.

3.3.5 Evaluation of the sufficiency of study information and student counselling

Students are informed about support opportunities through various platforms. All the most important information about student affairs is available on the website of Vilnius Tech. Another way students can receive all the necessary information is through social media (information is shared not only by the University, but by the Students Representative as well).

First year students have "Introduction to Studies" subject studies, which helps to get acknowledged with the structure and academic processes of the University. Students can also receive academic information through events that are organised by Vilnius Tech. What is more, the most important study documents are presented in Lithuanian and English languages, making them more accessible to foreign students. However, as mentioned above, the information about student's support possibilities do not reach students or students are not encouraged to take them, that is the biggest drawback, since the support services are just as equally important for student's study and career path development as studies themselves. Therefore, we recommend to have a focus on the informing students about these possibilities making them more appealing, so that students are more willing to take them.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Financial support for mobility opportunities;
2. Most of the information on the website is presented in two languages: Lithuanian and English.

(2) Weaknesses:

1. Lack of career counselling;
2. Numbers of applications to II cycle study programme needs to be higher;
3. Weak promotion of student services.

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

During the assessment, a universal paradigm was confirmed in practice when the University of Technical Sciences, following the main principle of the study system - the compatibility of scientific research and studies and the development of study skills, based on

the systematic, independent work of students. Successfully relying on appropriate tools - regulating the organisation of studies with regulations, a calendar schedule, and in individual cases - the rector's orders and by the decrees of the vice-rector or dean of studies, able to develop new but promising studies in the field of Biotechnology for the university and the State with limited human resources. The study process of programs in Biotechnology is dominated by lectures, practical work, laboratory work, independent work, and internships/research work. Contact studies take three primary forms: lectures, tutorials (seminars), and laboratory work.

Criteria for the assessment of study achievements are specified and defined in the VILNIUS TECH Senate Resolution No. 107-2.2 of December 11, 2018, "On the Approval of the Description of the Procedure for Assessing the Achievements of Vilnius Gediminas Technical University Students and Organising the Reports", which is published on the website (https://www.vgtu.lt/files/2931/146/7/17_0/107-2.pdf). Furthermore, the knowledge and skills of students acquired during studies are assessed on a ten-point scale and regulated by Order No. ISAK-2194 of the Minister of Education and Science of 2008 "On the approval of the student assessment system " is based on the cumulative assessment criteria defined in the Student Achievement Assessment Procedure that is directly related to learning outcomes.

Student engagement throughout the study period is ensured through cumulative assessment of achievements. The studies of each course are concluded with a final assessment, which is assessed by a grade or pass/fail. The final estimate of the course (module) is calculated according to the proportions given in the study card, adding the percentages of intermediate and final settlements. Intermediate assessments are mandatory. They vary in forms such as a report, term paper, laboratory work, homework, colloquium, test, and review of student results. During the student's semester, the grade accumulated for the mid-term assignments presented in the course can be from 30% to 70% (inclusive) of the final stage. Intermediate and final settlements are considered if they meet at least the threshold level. The teacher can increase the final grade by 10% for the student's active involvement and the excellent quality of the assignments.

During their studies, Master's students in Bioengineering and Nanobiotechnology work individually, preparing for mid-term assessments. They design and maintain the laboratory and perform follow-up, interim and final evaluations. Students also work in scientific research laboratories for 1-3 semesters (160 hours per semester). In the last semester of Master's studies, students work full-time (800 hours) on the final project. In both study programs, 81.7% are allocated to independent studies.

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

During the evaluation, we identified the efforts of VILNIUS TECH faculties to take into account the needs and conditions of students with disabilities by adopting a flexible payment schedule, partially or wholly exempting them from tuition fees.

A student with a disability is allowed to use financial support (152 EUR monthly allowance) to increase the accessibility of studies (can hire translators/consultants, use transportation services to the University, purchase equipment necessary for studies, etc.). The university infrastructure is fully adapted to the mobility of students with disabilities. Special conditions are provided for students with mobility disabilities, and sanitary units (toilets), an elevator for the disabled, etc., are installed. The University has psychological support staff who, if necessary, give lectures to lecturers about mental disabilities (how to recognize psychological difficulties and learning disabilities, communicate with them or help if necessary or refer them to people who can help). The University advises students with disabilities, provides emotional support, and, if necessary, refers them to the appropriate treatment facility. Disabled students, like all other students, can apply for emotional support or short-term psychological help.

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

During the evaluation, we determined the University's long-term systemic provisions to consistently create and implement an effective feedback system for monitoring the quality of the study process goals. It is aimed at the involvement of students to contribute equally to the educational process, and the University is guided by the principles of collegiality, listening to as many members of the community as possible, thus aiming to improve the organisation of the study process. Student feedback is obtained through systematic student surveys. It is used to enhance study programs, improve the organisation of the study process, and strengthen the composition and skills of the academic staff. Suppose negative trends emerge according to the survey results. In that case, additional actions may be initiated: interviews with the teacher by the psychologist and the Center for Educational Competencies, different follow-up lectures, personal feedback to the teacher on their work with students, and advice on improving

teaching and contacts with students. Also, thematic training may be offered. Study progress is monitored at the level of the University, Faculty, and the study program committees. According to the procedures approved by the University, formal control of learning outcomes is performed by the Faculty administration. Its staff checks the assessment results of each academic group and contacts the student if they cannot continue studies without changing their study status. In this case, the student has several options, depending on their academic assessments - to repeat the course, continue studies with an academic debt, take the academic leave, interrupt their studies, etc. The weighted average of the Bachelors' Bioengineering study program is between 7.55 and 7.79, increasing each year slightly. Meanwhile, the weighted average of the Masters' Bioengineering and Nanobiotechnology programs (the results of Master students are presented together without distinction between the study programs) is higher than that of the Bachelors' students and ranges between 8.41 and 8.65. SER data also show for both cycle another critical indicator of the students' achievements – the ratio of graduated/admitted. The values of this vary between 63 and 86 %. For Bachelors' and Masters' students who graduated between 2019 and 2020, this ratio is the same, 75 %. The proportion of graduated/admitted students stands out for Bachelor students who graduated in 2021 and is only 63 %. The decrease in the ratio could have occurred due to part of the students admitted in 2017 not graduating in 2021 and currently being on academic leave (10 students). The students, however, are expected to complete their studies in 2022. It is worth noting that the ratio of Master students that graduated in 2021 is higher (86 %) than in the previous years (2019 - 2020 it was 75 %).

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

We found SER information based on STRATA (Government Strategic Analysis Center, https://rodikliai.strata.gov.lt/?lang=lt&kpi_type=olevel&kpi_group=1) data on graduate employment was available only for 2018 and 2019 (for the period 2018-2021). Presented the employment situation for the first cycle graduates 12 months after graduation in 2019. This figure shows that the average monthly insured income of VILNIUS TECH students is the highest in comparison with the graduates of other universities (KTU and VDU) in the same field of study and amounts to 1227 euros. Compared to the graduates of 2018 (income of 954 euros) increased by 29 % in 2019. Also, a large part of graduates, as many as 60 %, work in positions that require high qualification, and only a small part, 12 %, work in positions that do not require high skills, whereas 29 % of graduates are not employed. Some of those may have

moved to another country, have their own business or continue studies for a Master's degree. Also, in 2019, the number of people in positions that require high skills increased by 50 %, and the number of people in low-skilled work positions decreased 2.75-fold compared to 2018. It is worth noting that the STRATA data represent 73 % of the first cycle graduates who graduated in 2019 (40 graduates, 29 records in the STRATA analysis) and 71 % of those who graduated in 2018 (52 graduates, 37 records in the analysis). It can be assumed that some students successfully continue their studies for a Master's degree. The University strives for graduates of the first cycle studies to successfully continue their studies or work in positions that require high skills. Therefore the trend of 2019 can be considered very successful.

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

In the evaluation process, we made sure of the systematic tools used, which help to maintain academic honesty, tolerance and non-discrimination at the University. University lecturers, students and visitors are guided by the principles of academic integrity defined in the code of academic ethics of Vilnius Gediminas Technical University. The teacher must react and report to the administration of the University or its department (Faculty, Institute, Department) or the Committee for Low and Ethics the cases of student dishonesty, such as plagiarism, copying, fabrication, falsification of data during the examinations or credit tests, submission of someone else's written work as their own, earning money by preparing of written works for other students, purchasing the written works and submitting it to a member of the academic community for evaluation, submitting the same evaluated written work during studies of another course, etc. In case of fraud, the student's work is not evaluated. The Dean imposes a penalty on the student such as:

- reprimand. Once this penalty is imposed, the student is given only one opportunity to retake the exam or assessment;
- harsh reprimand. After imposing this penalty, the student must retake the course (module). Upon identification of a repetitive case of fraud, the Dean requests the Rector to expel the student from the University. The University has implemented a specialised text comparison system that checks the amount of coincidence in uploaded written works by comparing them with active and archived websites and international scientific databases and with previously uploaded written works and other sources of information. Tolerance and non-discrimination principles of members of the academic community written in "The procedure for the

assessment and reporting of student achievements at Vilnius Gediminas Technical University" (Senate Resolution No. 107-2.3 of 11 December 2018) and "The code for academic ethics at Vilnius Gediminas Technical University" (Senate Resolution No. 116-3 of 18 February 2020). SER and interviews did not reveal any negative cases that occurred in practice.

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

Evaluation team found that Appeals of Vilnius Gediminas Technical University students regarding the assessment of knowledge are regulated by the Description of the procedure for submitting and investigating appeals (Order No. 10.8-1009 by the Rector of Vilnius Gediminas Technical University of 2 December 2020). Upon receiving the appeal submitted to the Head of the department, the Dean of the Faculty, the Vice-Dean, the Commission of Appeal that consists of 3 teachers, is concluded. If the reason is the score of evaluation, the chairman of the Commission is always the Head of Department. A member of the Commission may not be a teacher who has previously assessed the examination.

The student who disagrees with the examiner's explanations and arguments may submit a written appeal addressed to the Head of the Department that teaches a particular subject regarding the knowledge assessment and/or knowledge assessment procedures within ten calendar days from the date of assessment. No written complaints or appeals were lodged during the analysed period.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Well-established, well-regulated and structured study process;
2. Employers are pleased with University Graduates. We admit that they are recruiting them to work in high skills requiring jobs.

(2) Weaknesses:

1. We have not found a more systematic study of why in 2021, only 63 percent of students in 2017 completed their bachelor's studies.

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

The number of teaching staff for first and second cycle of program have been almost same for the last four academic years. Among them 80% holds a PhD degree which helps the teachers to bring their research experience and knowledge into their teaching. About 50-60% teaching staff is at Associate Professor/Professor level with long teaching and research experience. The teaching staff is involved in active research as reflected by high quality and good number (50-70) of publications in the last three years.

As per SER, 78-80% of teaching staff have an English proficiency at B2 level. The market of Biotechnology is growing in Lithuania as well as internationally. To capture the international market and create global leaders and Scientists, it is important that teaching and scientific training of students must be in English. For this it is necessary that staff should be proficient in the language which any way will also benefit staff immensely as they have to communicate all their findings in English.

The numbers of students for second cycle (Bioengineering and Nanobiotechnology) are constant (47-51) since 2017 while the strength is continuously declining (241 to 133) for students from first cycle which is a matter of concern. The reasons for this have not been cited in SER, but whatever be the reasons it ned to be taken care. Therefore, the improvement in teacher to student ratio in case of first cycle of program does not reflect any good.

A degree in Bioengineering/Biotechnology should include a good balance of Engineering and Biology subjects. The panel feels that the curriculum involves a large of Biology-based course but significantly lacks in Engineering topics from Chemical/Biochemical Engineering such as Stoichiometry, Unit operations, Material balance, Energy balance, Fluid flow and Mixing, Mass Transfer, Heat transfer, Homogeneous/Heterogenous reactions, Reactor engineering, Downstream processing etc. This is also supported by lack of research staff doing active research in such topics. One of the reasons for this could be shortage of faculty member having first degree in Engineering who could teach these subjects.

3.5.2. Evaluation of conditions for ensuring teaching staffs' academic mobility

Academic mobility is important for exchange and exposure of knowledge which cause enhancement in learning and eventually lead in high quality teaching and research. The section 6.2 of SER cites some examples of visit of long- and short-term visit of staff members. However, SER does not throw any light on policies and funding schemes of University to promote such activities and how majority of faculty members can take advantages of such policies and schemes. The faculty members should be strongly encouraged for short/long term visit and PhD/Post-Doc programs such as Humboldt/Marie Curie Research/Erasmus Fellowship to stay and time in internationally prestigious institutes with top researchers.

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

Vilnius Gediminas Technical University offer opportunities to teaching staff to ameliorate their teaching skills in various forms systematically: by consulting, participating in seminars, analysing methodological material in the created e-platform, etc. The University also strongly encourage their staff with less than ten years of experience to take training of 40 h in an year to improve didactic qualification while those with teaching experience of more than 10 years, 20 academic h/year are required.

As per the SER "The didactic competencies of teachers can be improved in other institutions of the Republic of Lithuania and (or) foreign countries". The panel strongly feel any kind of training/qualification for improving pedagogical skills rather than asking their staff to go to other institutes in Lithuania or foreign countries. In fact, a teaching qualification should be made mandatory for all the teaching staff irrespective of their position. The panel also suggest starting other courses for career development of staff members such as Leadership, Research Management, Writing Research proposals & Manuscripts etc. The section 6.3 mentions about participation of teaching staff in national/international conferences/seminars, but it does not make much contribution towards competencies of teaching staff. The panel appreciates that University pays half of the fee for improving English language skills. This is very important if program want to be recognized at international levels and achieve top global rankings. It will be really good if more efforts could be put in this direction.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Both first and second cycle of program are interesting with potential to make significant contribution to national economy.
2. The teaching and research experience of academic staff is long and strong.
3. The staff to student ratio is good for second cycle of program.

(2) Weaknesses:

1. Engineering topics are lacking in syllabus of both first and second cycle of programs.
2. No concrete schemes for mobility of academic staff.
3. Lack of courses for career development of teaching staff.

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 Department has very good facilities for theory lectures and practical classes. There are fifteen lecture halls (>1000 m^2) for lectures and practical classes for first and second cycle of programs. Further, courses such as Information Technology, Models in Biology, Basics of Bioinformatics, Mathematical Modelling of Biological Systems, Bioinformatics, Biochemical Engineering are taught in several computer classes equipped with MS Office suite and specialized programs such as MATLAB, Mathcad, SIMULINK, Magic Draw, Solid works, Autodesk, and other specialized open access programs. All classrooms, reading rooms and computer labs are covered by wireless Wi-Fi communication.

Specialised laboratories are used to perform experimental laboratory work in: General Chemistry, Analytical Chemistry, Organic Chemistry, Chemistry of Natural Compounds, Chemical Kinetics, Fundamentals of Microbiology, Molecular and Cell Biology, Microbiological Technology, Pharmaceutical Biotechnology, Gene Engineering, Fundamentals of Biochemistry, Biochemistry, Biochemical Methods, Technology of Pure Proteins, Bioengineering (Processes and Apparatus of Biotechnology), Fundamentals of Chromatography, Basics of Pharmaceutical Manufacturing, Enzymology, Methods of Isolation and Purification of Proteins, Cell Biology, Stem Cell Biology and Technology, Molecular and Cell Biology and Pharmaceutical Biotechnology.

The infrastructure is fully adapted for students with special needs which is really good. For example, Faculty of Fundamental Sciences has ramps, lifts and toilets adapted for people

with reduced mobility. Further, four workplaces for students with special needs have been created in the library using the tools and software. Students are offered a Braille printer, three image magnifiers, four special keyboards and the alternative computer mice. JAWS 14 software has been installed on four computers which analyses the information on the screen, transmits it to a speech synthesiser and converts the text into sound. Win Taker Voice 1.6 program transmits the information on the computer screen to the user in Lithuanian, whereas SuperNova Magnifier 13.03 enlarges all the information on the computer screen or parts of it.

In addition to the Vilnius Tech campus, premises of other institutions are used for teaching and research activities. For example, lectures are organised, and laboratory work is performed in subject areas of immunology and Nanobiotechnology using the infrastructure of the Open Access Centre of National Cancer Institute and Biomedical Physical Laboratory.

Vilnius Tech spends 167,000 Euro annually for acquiring publications. The Central Library publications consist of >95,000 titles of printed publications, >398,000 e-books and >26,000 titles in electronic journals. All the electronic resources are accessible to students using the remote access VPN service and can use material prepared by the teacher in the VILNIUSTECH learning environment Moodle. Library is always open and has 13 study spaces with 385 workplaces for visitors, of which 47 are computerised.

Learning facilities and resources to execute teaching and research activities for first and second cycle of programs are in a very good shape. The expert panel appreciates it, but there are some areas where infrastructure and facilities need to be developed. Upstream (Bench level fermentation and scale up) and downstream are at the core of Biotechnology/Bioengineering, the facilities in this area need to be strengthened. Further, the facilities and resources lack for Metabolic Engineering and Synthetic/System Biology work. The software facilities for performing techno-economic analysis and life cycle assessment need to be purchased. The section does not say anything about lab safety trainings which should be prioritised to avoid any mis-happenings.

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

According to SER, majority of equipment were renovated during 2010- 2013 and since then, no specific national programs have been announced to renew the resources required for the study programs. Therefore, renovation work is dependent on the internal budget of Vilnius Tech which is 120,000 Euro per year (15,000-20,000 EUR for the renewal of server resources; 30,000 EUR to improve the wireless network; >10,000 EUR annually to purchase Textbooks for Biotechnology).

The equipment for Biotechnology is purchased using the University internal funds. The equipment has also been acquired using the LMT-funded Research Group projects and competitive doctoral or postdoctoral programs. Although this equipment is primarily intended for researchers and doctoral students, it can also be used by students to prepare their final theses.

It is good that Vilnius Tech has allocated some funds for renovation (120,000 Euro per year) of lecture halls, laboratories, computer classrooms and renewal of software licenses, projectors and computers but the amount is not enough for the entire University. Surprisingly, there are no funds or concrete schemes for purchase of instruments which are the key for research and teaching. Further, there is no information on funding sources for hiring of Technicians. The Post-Doctoral staff and PhD students should have first priority for instrument/equipment purchased from funded projects. This leaves less scope and opportunity for Bachelor and Master students.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Strong infrastructure and resources for learning.
2. Well-equipped infrastructure for students with special needs.
3. Good quality Library with powerful resources amended with modern technology.

(2) Weaknesses:

1. Weak strategy for renovation and upgrading of resources.
2. No concrete funding for purchase of equipment.

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

University's operates the internal study quality assurance system which is based on standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). It is implemented through a quality management system for all processes at the University. In our opinion, it is of great value that Vilnius Tech adheres to international standards through

implementation of measures accepted and being developed by European Universities. Both SER and communication with social partners during the virtual visit attest for a wide involvement of all stakeholders at all levels into the process ensuring quality of studies. Teachers are constantly in contact with program committee members, they have ample opportunities to maintain and improve their professional competences, students participate in program committees, as well as in management bodies both at University, Faculty and program committee levels.

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

External partners indicated in their communication to the expert group that they constantly are addressed with various questions regarding improvement of the quality of both first and second cycle programs. Many alumni from Vilnius Tech are currently occupying high level management position in biotech or medtech industry, so they are both willing and capable of providing quality advices to the program committee. During our meeting we were surprised by level of representation from the partners, the alumni of Vilnius Tech. For example, one international company of medical diagnostics were represented in the meeting with the expert group by the general manager. We believe the department can greatly benefit from such situation, in which close contacts with high level industrial partners are actively maintained and undoubtedly this must be regarded as strength of the program.

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

While there is a wide range on information on studies in general, and the expected outcomes of Bioengineering and Nanobiotechnology program in particular, we did not find the collection specific information on quality improvement process. From SER it follows that neither university nor the Department does systematic collection and publishing information on quality assurance process. So, that there is no possibility for both academic community members and outsiders to track the transformation and improvement process leading to quality increase. We believe such process if introduced and properly maintained would greatly increase competitiveness of the programs, and lead towards consolidation of the community and social partners.

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

Students have considerable impact on the process of studies at Vilnius Tech, including the Department of Chemistry and Bioengineering. As it follows from SER, over several last year's student initiated changes in the structure of program modules. One of the most important improvements was the start of "Introduction to Bioengineering" course (SER, p.50).

Surveys and questionnaires on specific issues related to the programs is another way how students may impact and improve study process. Student surveys are mainly oriented towards a specific subject and the teacher. The teacher and Department chief have access to this information, so at the Department level the feedback systems seems operates quite well. However, we did not find if any systematic discussion, which can be translated in a specific set of measures to improve quality of studies, are being periodically organised at the department level, and how the decisions and conclusions of such exercised are being followed up.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Adherence to international quality assurance guidelines;
2. Strong and very active industrial social partners.

(2) Weaknesses:

1. Lack of periodic quality assurance exercises at the Department level which can provide a more systematic view by collecting information from all internal and external sources;
2. The lack of systematic collection of information of quality assurance processes in one single place.

IV. RECOMMENDATIONS

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	To reconsider the content of study modules in a way to comply with the legal requirements to provide Technological Design skills to students as well as to increase possibilities to personalise study curriculum (especially, in the second study cycle) in accordance to personal professional objectives of students.
Links between science (art) and studies	The study programs should involve elements which ensure that the latest developments of the research of the field are communicated to all students via seminars or practical works.
Student admission and support	Improve the information distribution to students and also increase the possibilities of student counselling.
Teaching and learning, student performance and graduate employment	We advise conducting a systematic evaluation of the students admitted in 2017 who did not complete their studies in 2021 due to the decrease in the ratio of students who completed the course and preparing an action plan for the future to avoid losses.
Teaching staff	More faculty members should be recruited who could teach Engineering and advanced topics (Circular Bioeconomy, Sustainability, Waste valorisation, Biorefining, Sustainability assessment, System/Synthetic Biology, Metabolic Engineering) and do active research in these areas. The meritorious students from second cycle of program should be offered PhD program with attractive scholarship scheme to ultimately absorb as faculty members. The Department/University should put serious efforts directed towards mobility schemes, teaching qualifications, English language skills and other career development courses.
Learning facilities and resources	There is a need to develop strong lab facility in area of Fermentation, Technology, Downstream Processing, Synthetic and System Biology. Vilnius Tech should develop some mechanism to arrange regular funds for renovation, upgrading/renewal of resources, hiring of technicians and purchase of equipment which currently relies mostly on funded projects.

Study quality management and public information	To initiate at the Department level a periodic (e.g. once a year) quality assurance exercises in which the Chairman of the Department along with the members of the program committee, student representatives and social partners can discuss issues important for quality of studies.

*If the study field is going to be given negative evaluation (non-accreditation) instead of RECOMMENDATIONS main **arguments for negative evaluation** (non-accreditation) must be provided together with a **list of "must do" actions** in order to assure that students admitted before study field's non-accreditation will gain knowledge and skills at least on minimum level.

V. SUMMARY

Main positive and negative quality aspects of each evaluation area of the study field *biotechnology* at Vilnius Tech University:

Vilnius Gediminas Technical University (Vilnius Tech) is largest higher education institute in Lithuania. The rapid development of Biotechnology in the country is dictated by several companies in the area such as Thermo Fisher Scientific Baltics, UAB Teva Baltics, UAB Biotechpharma, AB Roquette Alimina etc. The growth was further enhanced during pandemic for manufacturing components of Covid-19 vaccine in Lithuania.

Vilnius Tech runs in total three programs in the field of Biotechnology: one in first cycle of study (Bioengineering) and two in second cycle of study (Bioengineering and Nanobiotechnology). Out of the three, the two programs are offered in Lithuanian as well as English. The aim of these programs is to prepare young professional Biotechnologists through theoretical knowledge in the subject and experimental skills for academic institutes and Biotech companies in Lithuania and global market.

The panel found through SER and interaction with staff members that research is mandatory for all the teaching staff. Among teaching staff, 80% holds a PhD degree which helps the teachers to bring their research experience and knowledge into their teaching and about 50-60% teaching staff is at Associate Professor/Professor level with long teaching and research experience. A good number of them having ongoing national/international projects and publish in peer reviewed journals. The publication culture is facilitated through incentives in salaries. This really helps as teachers are able to use the gained knowledge during research into classroom teaching but it is not clear in what way and during what courses that knowledge is transferred. The students are also involved in these research projects and eventually become part of publications as co-authors. Besides, they get opportunities to do internship in Biotech based companies where they understand requirements of industries. Yet it is not ensuring access to every student to be part of a research project or industrial exposure. Another thing to mention is that student employability in high skill jobs is increasing.

The market of Biotechnology is growing in Lithuania as well as internationally. To capture the international market and create global leaders and Scientists, it is important that teaching and scientific training of students must be in English. For this it is necessary that staff should be proficient in the language which any way will also benefit staff immensely as they

have to communicate all their findings in English. SER cites some examples of visit of long- and short-term visit of staff members, however, it does not throw any light on policies and funding schemes of Vilnius Tech to promote such activities and how majority of faculty members can take advantages of such policies and schemes. The faculty members should be strongly encouraged for short/long term international visits.

Vilnius Tech offer opportunities to teaching staff to ameliorate their teaching skills in various forms systematically: by consulting, participating in seminars, analysing methodological material in the created e-platform, etc. The panel strongly feel any kind of training/qualification for improving pedagogical skills rather than asking their staff to go to other institutes in Lithuania or foreign countries. In fact, a teaching qualification should be made mandatory for all the teaching staff irrespective of their position. The panel also suggest starting other courses for career development of staff members.

The drop in number of Bachelor students over the years in concerning and the Department should make some strategy to overcome this issue. One solution could be enhancing the visibility of program at global levels to attract international students. The University provides opportunities for career development of students and they also receive financial, psychological and other support. The students participate in several mobility schemes to gain international exposure and are supported through scholarships which is really good. The faculty members take into account the needs and conditions of students with disabilities. Further, Vilnius Tech infrastructure is fully adapted to the mobility of students with disabilities.

A degree in Bioengineering/Biotechnology should include a good balance of Engineering and Biology subjects. The panel feels that the curriculum involves a large of Biology-based course but significantly lacks in engineering topics from Chemical/Biochemical Engineering.

The Department has very good facilities for theory lectures and practical classes and specialised laboratories are used to perform experimental laboratory work. In addition to the Vilnius Tech campus, premises of other institutions are used for teaching and research activities. Learning facilities and resources to execute teaching and research activities for first and second cycle of programs are in a very good shape. The expert panel appreciates it, but there are some areas where infrastructure and facilities need to be developed.

It is good that Vilnius Gediminas Technical University has allocated some funds for renovation of lecture halls, laboratories, computer classrooms and renewal of software licenses, projectors and computers but the amount is not enough for the entire University.

Surprisingly, there are no funds or concrete schemes for purchase of instruments which are the key for research and teaching. Further, there is no information on funding sources for hiring of Technicians.

Expert panel chairperson signature:

Dr. Vinod Kumar **(signature)**