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CENTRE FOR QUALITY ASSESSMENT IN HIGHER EDUCATION

EVALUATION REPORT

STUDY FIELD of GENETICS

at VILNIUS UNIVERSITY

Expert panel:

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2. **Assoc. prof. dr. Arjan de Brouwer,** *academic;*
3. **Mr. Julius Gagilas,** *representative of social partners;*
4. **Ms. Miglė Agnietė Bartels,** *students' representative.*

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Report language – English

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Vilnius
2022

Study Field Data

Title of the study programme	**Genetics**	**Genetics**
State code	6121DX005	6211DX006
Type of studies	University studies	University studies
Cycle of studies	First cycle	Second cycle
Mode of study and duration (in years)	4 years studies	2 years studies
Credit volume	240	120
Qualification degree and (or) professional qualification	Bachelor of Life Sciences	Master of Life sciences
Language of instruction	Lithuanian	Lithuanian, English
Minimum education required	Secondary education	Bachelor degree
Registration date of the study programme	20 July 2010, No 1-01-66	19 May 1997, No 565

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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 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 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 (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 site visit to the HEI was conducted by the panel on *20 September, 2022.*

Prof. dr. Halina Gabryś (panel chairperson), *professor emeritus, Department of Plant Biotechnology, Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Poland;*

Assoc. prof. dr. Arjan de Brouwer, *associate professor, Department of Human Genetics, Radboud University Nijmegen Medical Centre, The Netherlands;*

Mr. Julius Gagilas, *director of JSC „Diagnolita", Lithuania;*

Ms. Miglė Agnietė Bartels, *Master of Science: Biology (Specialization: molecular- and cell biology), Free University of Berlin, Germany.*

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.	Six examples of student surveys on the study subjects
2.	List of research publications (2017-2021) of permanent teaching staff of the Genetics study programmes
3.	Two examples of master theses in the English language

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

Vilnius University (hereinafter the University, VU) is the oldest and biggest state higher education institution (hereinafter HEI) in Lithuania. As of January 1st 2021, the University has 15 core academic units: 11 faculties, an institute, an academy, a centre and a business school, and 12 core non-academic units. VU offers 60 fields of study distributed across 12 study groups. The University offers more than 90 bachelor's and integrated study programmes, and 100 master's and pedagogical study programmes.

Genetics studies are carried out at the Life Sciences Centre (hereinafter the Centre, LSC), which was established in 2016. The Centre consists of three institutes which conduct research in areas related to the evaluated study field. These are: Institute of Biochemistry (research on gene structure and expression, cell signalling and regulatory systems, protein structures, functioning and practical applications, organic syntheses), Institute of Biosciences (systems important in the functioning of organisms, behaviour, biodiversity, genetics, epigenetics, populations and ecosystems), and Institute of Biotechnology (proteins and nucleic acids, bioinformatics, immunodiagnostics, epigenomics, drug development, microfluidics, and genome editing technologies). LSC conducts seven 1st cycle – and nine 2nd cycle study fields, and doctoral studies in the field of natural sciences, the latter together with the Nature Research Centre. LSC offers one 1st cycle programme and one 2nd cycle programme in the field of Genetics. Both programmes are broad and cover several areas: human, plant and microbial genetics, epigenetics, as well as developmental, population and ecological genetics. The Centre cooperates closely with social partners: universities, institutes, companies, associations, etc. Most important for the genetics study field are National Cancer Institute, Nature Research Centre, JSC Thermo Fisher Scientific Baltics. These collaborations help to improve the Genetics programmes according to needs of the society and to increase the students' chances at the labour market.

The Genetic study field was previously evaluated in 2013; both 1st cycle and 2nd cycle programmes were evaluated positively, and both received 21 per 24 points. As a result of evaluation the following changes have been made in the study programmes:

- the number of electives was increased to 40 credits in the 1st cycle and to 35 credits in the 2nd cycle;
- extended courses on bioinformatics and data analysis as well as courses dealing with rapidly growing fields of genetics were introduced into the study programmes; the latter include next generation sequencing, genomic data analysis and transcriptomics;
- other courses added in the 2nd cycle studies are: Virology, Epigenetics and Bioinformatics, and Management in a Modern Biotechnology Company;
- the offer of studies within the Erasmus programme was increased;
- aims and outcomes of the 1st and 2nd study cycles have been diversified;
- a multi-level system has been developed to provide feedback from lecturers to students and vice versa;
- the description of courses has been revised to clarify self-study tasks and their assessment;
- the library opening hours have been extended to 24 h;
- laboratories are equipped according to the highest safety standards;
- feedback from students and alumni has been improved;
- more stakeholders participate in the continuous improvement of the programme.

II. GENERAL ASSESSMENT

Genetics study field and **first cycle** at Vilnius University 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	3
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	4
	Total:	28

*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.

Genetics study field and **second cycle** at Vilnius University 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	3
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	4
	Total:	28

*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)

(1) Factual situation

The VU states clearly that it wants to create an international atmosphere. The programmes in Genetics are designed to train graduates for a successful international and national career, *e.g.* to work at medical and agricultural research institutions. In these cases, the working environment is international, which means that the use of proper English is imperative for the students. The final terms that the students will have to comply with, and the competencies, such as analytical thinking and communication, are in general tailored to the needs of the labour market and society at large. This is exemplified by the common practice to be employed at the enterprises or organisations of the social partners when the students graduate (SER pp 7-8).

Modern genetics is based on molecular, bioinformatics and statistical research methods. Therefore the first-cycle students get different broad courses, *e.g.* in chemistry, physics, mathematics, as well as courses in biostatistics and bioinformatics. The second-cycle students get a course on big data analysis amongst others. Research is well embedded as for instance in the second-cycle programme, approx. 40% of the total study volume is devoted to practical work (SER p. 13).

The VU organises various scientific events in which globally well-known scientists, including Nobel Prize winners, take part (SER p. 7). Student conferences are organised as well, and a VU team takes part in the International Genetically Engineered Machine (iGEM) competition giving the students ample opportunity to extend their competencies beyond the framework of the courses and the regular practical work.

(2) Expert judgement/indicator analysis

During the interviews with the students, it became clear that the 2nd cycle study programme contains a practical internship for a maximum of six months. However this limits the students in their primary goal: finding a research position in a company or as a PhD student. We suggest that there should be two MSc internships (both six months or one for three months and one of six months) to be fully prepared for the next step.

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

(1) Factual situation

The aims and outcomes conform to the VU mission "*to enhance the cognitive and creative potential of both Lithuania and the world; to nurture academic and other spiritual and social values and to educate active, responsible citizens and society's leaders in the State of Lithuania*" (SER p. 8). Especially the aim to train creative specialists and plan their professional career, with versatile knowledge and special abilities, will allow them to successfully join both national and international research teams.

The team of teachers is up to their task as shown by their individual contribution to scientific journals, membership of international scientific organisations, and research activities involving students of all study cycles. This is the basis to become a high ranking university in Europe. Lecturers also go abroad to improve their teaching abilities and update their scientific qualities. This international study environment is also stimulated by the possibility of international mobility for students. This encourages students to perform international research and follow certain study events. In addition, it attracts lecturers with international experience and academic qualifications.

(2) Expert judgement/indicator analysis

It is applaudable that the HEI wants to create an international environment for the 1st cycle and 2nd cycle students. That way the students are interesting for EU companies in- and outside Lithuania. The use of proper English is imperative for that. However, we noticed that less than 20% of all MSc theses are written in English. In addition, most of the courses are taught in Lithuanian, especially if no students from outside Lithuania are present. Therefore, we would suggest that more emphasis should be laid upon the use of scientific English in the 2nd cycle theses and during the courses. That way the students are getting used to using English on a regular basis and also lecturers will be more at ease with English. Also non-Lithuanian lecturers can accordingly give lectures.

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

(1) Factual situation

In brief, both study programmes comply with the Lithuanian legal requirements. It is based on the Lithuanian Qualifications Framework,[1] the Description of General Requirements for Study implementation,[2] the Descriptor of Study Cycles,[3] the Study Regulations of Vilnius

[1] Lithuanian Qualifications Framework approved by Resolution No 535 of 4 May 2010 of the Government of the Republic of Lithuania (Official Gazette, 2010-05-15, No. 56-2761), see https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.372306/asr
[2] Description of general requirements for study implementation" approved by Order No. V-1168 of 30 December 2016 of the Minister of Education and Science of the Republic of Lithuania (TAR, 2016-12-30, No. 30192), see https://eseimas.lrs.lt/portal/legalAct/lt/TAD/a4caf862ced511e6a476d5908abd2210/asr

University[4] and the Descriptor of the Groups of Study Fields in Life Sciences[5] (see SER p. 9). The 240 credits for the 1st cycle study programme and 120 credits for the 2nd cycle programme are well-accounted for.

(2) Expert judgement/indicator analysis

The expert panel deems that this is adequate. We do not see room for improvement at this moment.

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

(1) Factual situation

In practice, these requirements as stated in Annex 1, Annex 2, and Annex 3 of the SER are ensured by the structure of the study programmes, and by the academic staff who are scientists at the highest national and international level. For instance, the general competency, '*personal abilities*', complies with study outcome 1.1 '*Will be able to organize and plan their professional, research and educational activities and learning process independently and responsibly, and will have the learning skills for independent personal development*.' (SER annex 1). This study outcome 1.1 is gained during '*General and physical chemistry*' (amongst others; SER annex 2) and tested at least partially by problem solving tests and the evaluation of a final paper. The academic staff is well aware of these final aims and outcomes for the students and organise their courses according to those principles. In case specific topics are discussed, lecturers, including eight Nobel prize winners in the last five years, from abroad are invited to provide the opportunity to expand the range of trained competences for the students (SER Table 12).

(2) Expert judgement/indicator analysis

The expert panel deems that this is adequate. We do not see room for improvement at this moment.

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

(1) Factual situation

The aims and outcomes are achieved through the courses that are given (SER: annex 3). The credits that are given for each course are in multiples of five. A single study credit represents 25–30 work hours of a student, which is according to EU law. The subsequent tests, *i.e.*

[3] Descriptor of Study Cycles Order approved by Order No. V-1012 of 16 November 2016 of the Minister of Education and Science of the Republic of Lithuania (TAR, 2016-11-17, No. 26908), see https://eseimas.lrs.lt/portal/legalAct/lt/TAD/d32e4f70ad0811e68987e8320e9a5185?jfwid=-9dzqntza2
[4] Resolution No. SK-2012-12-4 of the Senate Commission of Vilnius University of 21 June 2012 approving the Study Regulation of Vilnius University. See https://www.vu.lt/site_files/SD/Studiju_programu_reglamentas_2014_01_27.pdf
[5] Order "On the approval of the Descriptor of Groups of Study Fields in Life Sciences of the Minister of Education and Science (except for the field of Ecology Studies) of the Republic of Lithuania (No. V-495 dated 30 March 2021). https://www.e-tar.lt/portal/lt/legalAct/112dbc30916011eb9fecb5ecd3bd711c

written test, defence of laboratory work and such like, are sufficient to evaluate the quality of the students and fit the teaching modules. The total volume of credits in a course is based upon the intended outcomes, *i.e.* courses that are mainly concerned with lab work or those that train specific research methods have more credits than other courses. The study programme is well-structured in that the credits fit the content of the courses. In case this is not the case, *i.e.* a course is deemed too light or too heavy, the students can voice their opinion on the credits that can be gained as well in the Study Programme Committee (hereinafter SPC) meetings. These are held each semester during which the results of the anonymous survey of the previous semester are discussed. In cases of valid feedback, *e.g.* the course in Bioinformatics Analysis of Big Data, the credit points are adjusted.

The division between more theoretical and practical work is well thought of for the 1st and the 2nd cycle (SER p. 12). The proportion of contact hours and self- study hours are at one third, which is what is also seen for other universities. The hours allocated to electives are also in line with the contents of the study. There are about two courses that the students can select from in these instances.

(2) Expert judgement/indicator analysis

In general, the semester structure is judged as adequate by the expert panel. During the interviews, the students also said that they considered the programme to meet their expectations, **although they would like to have more choice in elective**s.

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

(1) Factual situation

Students have ample opportunity to select their individual study plans. Each programme has specific time dedicated to courses of their own choice. Students in the 1st cycle of studies can choose courses worth 40 credits in their semesters. Students in the 2nd cycle of studies in the field of genetics can choose courses worth 35 credits in the first three semesters. They may opt for more additional skills or knowledge by choosing an individual study plan and courses from other 2nd cycle programmes. Obviously, they can also select an internship of their own choice.

(2) Expert judgement/indicator analysis

The students can fill a part of their programme with electives in their 1st and 2nd cycles. This allows them to make the programme tailor-made according to their own wishes. During the meeting with the students, however, it became clear that there is a limited choice in electives. In addition, **the balance between compulsory and elective needs to be revised and brought up-to-date**. Besides this some courses are recycled between the 1st and 2nd cycle. They even have identical slides according to the students. We feel that these courses can be added as electives rather than being compulsory.

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

(1) Factual situation

The defence of the final thesis is in accordance with the regulations of the VU (Table 16 & 17; SER). The students are supervised by both their primary supervisors and the chairman of the genetics SPC. The requirements for the theses and evaluation criteria are up-to-date. The aim of the final thesis is to show that the student is capable of performing independent research and to develop verbal and written research communication skills. Evaluations show that the students have a problem-solving ability, an ability to plan and conduct a research experiment, an ability to select the appropriate methods for work and processing of results, an ability to draw appropriate conclusions, and to write the thesis using the correct language.

The final thesis in the 1st cycle study programme must be written in the Lithuanian language and in the 2nd cycle study programme, in either Lithuanian or English language (SER p. 16). The defence of these theses is before the committee composed of the researchers of the VU and a representative of the social partners, who is appointed as chairman of the committee. The final thesis must also be evaluated by one reviewer, the conclusions of which are taken along in the defence. The decision regarding the final evaluation of the thesis shall be taken by the committee.

(2) Expert judgement/indicator analysis

The thesis procedure seems well organised with the appropriate measures to ensure a valid thesis defence. However, we noticed that less than 20% of the final 2nd cycle theses are written in English. We suggest that this could be changed and that **more of the 2nd cycle theses should be written in English.** Theses written in Lithuanian contain an abstract in English which often is too short to describe the essence of the research done in it.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The study aims, learning outcomes, study structures are well defined and fit both study programmes.

2. The final terms that the students will have to comply with, and the competencies, such as analytical thinking and communication, are in general tailored to the needs of the labour market and society at large.

3. The students' voice is heard directly in the study programme committee meetings and in cases of valid feedback their feedback is directly implemented.

4. The thesis procedure is well organised with the appropriate measures to ensure a valid thesis defence.

(2) Weaknesses:

1. For a study with an international component, the use of English is imperative. There is limited use of English in the courses and in theses. We suggest that this should be improved. The 2nd cycle thesis for instance could be written in English. **If a thesis is written in Lithuanian it should at least contain an extensive (1-2 pages long) abstract in English.**

2. There is a limited choice in electives. In addition, the balance between compulsory and elective courses needs to be revised and brought up-to-date.

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

(1) Factual situation

According to the results of the comparative R&D assessment performed in 2018 and 2019, VU was the leader among universities and research institutes in Lithuania in the field of natural sciences. In particular, the Biology study field, closely linked to the Genetics study field received the highest score in 2018 (SER, section 2.1, p.17). The number of scientific publications cited in Clarivate Web of Science tripled in the period of 2017-2020 (SER, table 4, p.18), with a peak in 2019. The total number of publications decreased between 2018-2020 due to the drop in papers not registered in the Web of Science system. This trend shows the increasing care for the research work quality. Annex 4 shows sufficient conformity between the teaching staff publications and the taught subjects. Only in a few cases, there are two or less publications presented instead of three most important papers published within the last five years.

Another indicator of research activity is the number and variety of research projects implemented by the academic staff of the study field in recent years. Of almost fifty nationally and internationally funded projects listed in the SER, in table 5, p.18, eleven are still running.

(2) Expert judgement/indicator analysis

Scientific activities of the academic staff assessed by quality and number of scientific publications as well as number of realised research projects are fully sufficient for successful training within both study cycles of Genetics field of study.

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

(1) Factual situation

Most courses in the 1st and 2nd study cycles are taught by researchers who directly work on the subject they teach; several teachers are acknowledged experts in their research fields. The teaching staff cooperate in research with Lithuanian and foreign institutions (8 and 19 institutions respectively named in the SER in that context) partners. This cooperation is an important factor to ensure constant contact with new, developing areas in science. This is also complemented by public lectures (details given in the report in section *3.5.3*), seminars and conferences organised by the VU LSC. Teachers include the latest developments in science in their lectures and seminar discussions. The examples available in SER (p. 23) were supplemented by information given by the teaching staff during a thorough discussion on this aspect of teaching with the expert panel.

(2) Expert judgement/indicator analysis

The latest developments in science and technology are present in both cycle programmes. However, there is still room for improvement. Genomics is all about big data analysis now. This is envisioned by a course in big data analysis for 2nd cycle students. To do this properly, **the information and communication technology (ICT) infrastructure supporting these analyses should be improved. A dedicated server for these purposes is vital.**

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

(1) Factual situation

100% of the students of the field study are involved in research in scientific laboratories: research work is mandatory for 1st cycle students from the 6th semester, and for 2nd cycle students - from the 2nd semester. Students are encouraged to join research also prior to these mandatory limits, practically from the beginning of studies.

The research cooperation of academic staff is reflected in students' final theses. Students may conduct research at both LSC and social partner scientific laboratories. These are typically Nature Research Centre, National Cancer Institute, Thermo Fisher Scientific Baltic. In 2019–2021, 25% and 37% of bachelor and master theses respectively were carried out at partner scientific laboratories.

Students participate directly in the implementation of numerous scientific projects funded by VU or from external sources. Their results are presented at Lithuanian and international scientific conferences, *e.g.* at the meetings of the Lithuanian Biochemical Society, FEBS, or COST. Between 2017 and 2020, 63 student works were presented at various conferences including the student organised COINS and Open Readings. Students are also co-authors of scientific articles. In the same period 20 students of the genetics study programme were co-

authors of 21 scientific articles (nine of the 1st cycle students, and twelve of the 2nd cycle students). Three students were first authors of the article.

It is also worth mentioning that the programme students participate in the iGEM Vilnius project: 12 students of the Genetics study field were members of iGEM student teams which attained spectacular achievements at international competitions, *e.g.* in the area of synthetic biology. Last but not least, in 2020, genetics student volunteers took part in the work of the molecular testing laboratory for the COVID-19 PCR tests established by LSC. The students were 1/3 of all volunteers.

(2) Expert judgement/indicator analysis

Analysis of the available data (section 6.1 of SER) confirmed during the site visit, shows that students of both Genetics study cycles have excellent conditions to get involved in scientific activities. Even though in the case of 1st cycle students the involvement in research work from the very beginning of the studies might seem somewhat premature, the experts' experience shows that it is very profitable for more dedicated individuals who attain their study outcomes earlier and may faster develop new skills and knowledge.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The quality of scientific publications of academic staff shows an increasing trend.

2. Teaching and research are closely linked in both study cycles in Genetics.

3. Students of both cycles are involved in research activity. Students often are co-authors of scientific articles.

(2) Weaknesses:

1. Big data generation and analysis, use of omics technologies is underrepresented in the 2nd study cycle programme including internship and final thesis preparation. This is mainly due to the information and communication technology (ICT) infrastructure, which should be improved. A dedicated server (or such like) for big data analysis, such as bioinformatics, genomics, and transcriptomics, is vital for this study programme.

2. Social partners' scientific laboratories could be more extensively used for student final theses preparation to acquire qualifications that are needed for the industry or social partners

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

(1) Factual situation

Information about the admission conditions is published by VU, Association of Lithuanian Higher Education Institutions for Centralised Admissions (LAMA BPO), other webpages, various publications ("Kur stoti", etc.), presentations during study fairs, and visits to general education schools. There are also other events, or initiatives like "Student for one day", "Students to pupils, pupils to students", and "Ask a student" where future students can get all the information they need regarding admission.

Admission to Vilnius University 1st cycle of Genetics is based on the admission score; on the website the methodology for its calculation can be found. Basically, the admission score is made from the score of the national examination in Chemistry, Biology and the Lithuanian Language (test) and the grades for the year in the following subjects: Mathematics, Biology, Chemistry and the Lithuanian Language. It is possible to get additional scores added, for example, for basic military training or participation in voluntary activities, the full list is published and accessible.

Admission to the VU 2nd cycle study programmes takes place according to the VU Admission Procedure to Second-Cycle Study Programmes. The following persons are admitted to the Genetics study programme: those who have completed the 1st cycle studies in genetics, microbiology, molecular biology, biophysics, biochemistry, biotechnology, and informatics studies at the university or have acquired the professional bachelor's degree in a college or have completed have graduated from the supplementary studies programme in Biology at VU. The score is an open contest, and it is made according to a formula that is also published and is easily accessible.

(2) Expert judgement/indicator analysis

The admission procedures and rules are straightforward and easily accessible from various sources. In recent years, the number of students admitted to the Genetics study programme 1st cycle with scores over 9 (out of 10) were seven in 2018, fourteen in 2019, nineteen in 2020, and eighteen in 2021. This indicates that good students are willing to study this programme. Admission to the 2nd cycle study programme has remained stable, the admission figures largely depend on the decisions of the Ministry of Education, Science and Sport. The expert panel thinks that this is adequate.

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

(1) Factual situation

VU conducts academic recognition of education and qualifications related to higher education and acquired under the education programmes of foreign states and international organisations in accordance with a right granted by the Minister of Education, Science and Sport.

The University adheres to the Lisbon Recognition Convention when making decisions about academic recognition. Qualifications are treated equivalently if there are no crucial differences. Each foreign qualification is evaluated and a decision about its academic recognition is taken individually. In addition, informal and non/formal qualifications can be recognized either based on previous agreements or without in accordance with the procedures up to 50% of the total programme credits. Partial previous studies can be recognized up to 75%.

Each foreign qualification is evaluated and a decision about its academic recognition is taken individually, based on available information and the practice of evaluating and recognizing similar or equivalent foreign qualifications, thereby ensuring the consistency of qualification recognition practice. For example, during the period analysed, three students who enrolled in second cycle studies had their qualification granted abroad (Spain, Norway and Turkey), recognized.

(2) Expert judgement/indicator analysis

Appropriate and reasonable procedures for the recognition of foreign, partial, and non-formal/informal qualifications are established. These procedures are in line with the Lisbon convention, and in the site visit the panel could confirm that there were no indications of problems arising from their application. Also, in the SER (p. 32) there are statistics confirming that several students could get their foreign qualifications etc., recognized.

3.3.3. Evaluation of conditions for ensuring academic mobility of students

(1) Factual situation

Studies abroad and international cooperation processes at VU are administered by the International Relations Department. Travel for students for Erasmus placements is organised and administered by the Student Services and Career Department. There are specific VU LSC representatives that students can conveniently contact.

Students in all cycles of the field of study are provided with opportunities to travel for a semester or for a year of partial studies, and also for compulsory work experience at the time specified in the study plan. Also available, is additional work experience in summer, and graduate work experience immediately after studies under Erasmus+, ISEP, the Nordplus programmes and bilateral cooperation agreements. Students of the study field also have

access to 38 universities of the Coimbra Group of universities which comprises the oldest classical universities in Europe. Students can leave not only to study in universities in Europe, but also Australia, Singapore, Japan, Korea, China, Canada, Taiwan, Thailand, Brazil, Russia and other universities with which VU has signed bilateral exchange agreements.

Students in the 1st cycle Genetics programme can travel abroad to study under 22 agreements, while those studying in the 2nd cycle Genetics programme can travel abroad to study under 23 agreements (data of 2021). In 2017–2018, one of the 1st cycle students in the Genetics programme and two students in the 2nd cycle Genetics programme travelled for partial studies. In the following academic year (2018-2019), one student in the 1st cycle Genetics programme and two students in the 2nd cycle Genetics programme travelled for partial studies. In the past years, due to the COVID-19 situation, the number of students leaving for studies abroad has decreased. In 2019–2020 and 2020–2021 only one student in each year travelled abroad for partial studies.

2nd cycle studies in Genetics in English were launched in 2019–2020. In 2019–2020, one student arrived for full-time studies from Turkey and in 2020–2021, two students - one from Spain and one from Norway. In 2021–2022 there were no international students, although there were students interested in the study programme and even some who received a scholarship covering their study costs at VU. However, due to the COVID-19 situation, they declined the scholarships and did not commence their studies.

(2) Expert judgement/indicator analysis

The possibility of going abroad is supported by the VU. The communication system is also well developed. However, as can be seen from the above-mentioned statistics, the mobility figures of students are still low. According to the University, many students in the Genetics programme have a job in the same field as their studies, especially the postgraduates. The university tries to bring internationalisation to home: students of the field are taught by foreign lecturers etc.

During the site visit, the panel members had the opportunity to talk to the students. After the interview, it turned out that students of the 1st cycle must find a lab placement, where they will write their thesis in the last semester, early on. For this reason, they are afraid to go abroad, because they might lose their lab placement, and when they come back from abroad, they will have difficulties finding a new lab. This could explain the low numbers of bachelor's students going abroad. **It would be reasonable, if the students could get a guarantee that leaving for Erasmus, or for another mobility programme, will not negatively impact their placement in the lab.**

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

(1) Factual situation

The students from the 1st and 2nd cycle can receive support: academic consulting, career services, cultural and leisure services, library services, financial and accommodation services, psychological support services, religious services and many more. The University has a mentorship programme that is dedicated to holistic developing the students' competences and ingenuity, improving their academic and personal achievements, increasing their motivation to study, and acquiring the valuable experience of the mentor while at the same time receiving valuable advice about planning their professional future. Volunteer University teaching staff and alumni share their personal experience, thereby contributing to the personal and professional development of the students and strengthening the University community. The VU mentorship programme has been a huge success. This can be seen from the numbers of how many students participated. In 2019, 78 volunteer mentors from various fields of science and 80 students participated in the programme. In 2020, 103 volunteer mentors and 123 students participated (SER, p. 35).

VU also provides career guidance services. Also, students are offered various professional development training, like effective learning, how to write a CV letter, simulations of job interviews etc. Financial support is the main form of social support provided to the students. Students can receive different scholarships and support. Also, students of the field of study have various opportunities to pursue their hobbies at the Culture Centre of VU.

(2) Expert judgement/indicator analysis

The expert panel thinks adequate. There are student mentors that help the students during their 2nd cycle internships. However also during the regular programme, a mentor could be useful. For instance, with regards to selecting an elective. We suggest that a mentor could also help the students in this respect.

3.3.5 Evaluation of the sufficiency of study information and student counselling

(1) Factual situation

Newly-admitted students participate at the VU integration week. The schedule for this week includes meetings with members of the SPC who introduce the aims, intended outcomes, methods, and individualised opportunities of study programmes. All information about the study process (the study calendar, lectures, examination schedule, choices regarding studies, evaluation, retakes), partial studies abroad, payment for studies, scholarships, and study financing is also provided to students at the LSC Study Division during meetings. The students have several opportunities to access the information they need during their studying time.

(2) Expert judgement/indicator analysis

In general, the support is very good. The students can get help from the career centre. They are very friendly, but hard to find. The coordinator of internships of Life Sciences is apparently not active. The professor helps in the end for the 1st cycle students. In the introduction week, however, the students thought that there could be more time dedicated to the career centre and to the information of practical work (where/who/what?). Maybe some students from the other years could help out in giving information about this?

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. VU provides the student a lot of support, in many areas including financial, psychological and academic.

2. There is a very strong connection between the students, and between the students and the teaching staff. Students from the 1st and 2nd cycle feel belonging to a community.

(2) Weaknesses:

1. Mobility of students, both from the 1st and 2nd cycle, could be encouraged more.

2. First cycle students feel anxious about their lab placements, since according to them, there are not many, and in the fear of losing their placement they tend not to use the mobility programmes.

3. During the regular programme, a mentor could be useful not only in the context of internships, but also during the rest of the studies, for instance by selecting electives and such like.

4. Students thought that there could be more time dedicated to the career centre and to the information about practical work (where/who/what?). Students from the other years could help out in giving information about this.

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

(1) Factual situation

Competences and learning outcomes are directed towards the specific knowledge and on the development of general competences for further studies or the needs of the labour market. Employees of social partner and biggest employer - Thermo Fisher Scientific Baltics are involved in teaching three courses in the 2nd cycle of studies, many students carry out research practice and work experience in the company (SER, p. 43). Social partners, employers and alumni are consistently giving feedback by surveys or informally (see SER, p. 61), so that these competences are adequately adjusted. This results in a culture where creativity, and critical thinking as well as the competence to solve problems in the world and society at large, is basic. This has been achieved by establishing direct communication between teachers and students, and by actively involving students in other staff activities, such as laboratory workshops and meetings, and coffee breaks.

The teaching components, *e.g.* lectures, seminars, workshops and laboratory work, are well executed by the teaching staff as judged by the students and the lecturers. Self-study tasks are performed using the E-learning platform, Moodle, or the Teams platform. The outcomes of the self-study assignments are discussed during contact sessions. Despite the Covid-19 pandemic, there was a relatively low impact on the progress of the students since remote training or mixed training was organised. The main methods for student assessment are closed questions tests, written answers to open questions, performance of specific tasks during the examination, evaluation of laboratory work, evaluation of experiments, evaluation of written essays/summaries, evaluation of individual work, and evaluation of individual or group reports/projects.

Since 2020 there has been a significant increase in the demand for various life sciences specialists in enterprises, which means that an increasing number of graduates from the 1st cycle of studies are immediately employed and enter the labour market according to their speciality without further studies. For 2nd cycle students, this is different as they go more readily to research and higher education institutions in Lithuania and abroad after they graduate to further improve their competencies. For example, out of 53 graduates who completed the second cycle in 2018–2021, 12 (23%) enrolled in the doctoral studies of biology, biochemistry or chemical technology at VU.

(2) Expert judgement/indicator analysis

The learning outcomes and competencies seem to fit well with the needs of the social partners, industry and Lithuanian biotechnology strategy roadmap. The incorporation of social partners' feedback with respect to the competencies is well thought of. Also the tight connection between the students and the teaching staff is to be applauded. This is an example to other universities. The evaluation methods for students are up-to-date, which shows in the willingness of the social partners to employ the 1st cycle students and the ease with which the 2nd cycle students can find a position.

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

(1) Factual situation

In 2020, VU approved its five-year strategy for promoting diversity and equality, which defines major guidelines of work till 2025. The university has an effective procedure for individualising the study process to suit the special needs of disabled students. Every year, the accessibility of the physical environment of the university is improved, and access to a variety of compensatory equipment for students with movement, vision or hearing disabilities is provided.

Students with disabilities can also benefit from more flexible study opportunities and, if necessary, get consultancy from specialists with expertise in the relevant area. The VU Community Development Division employs a coordinator and central contact for disabled individuals. Each semester the coordinator encourages future and current VU students with disabilities to contact her on the issues of admission, studies, practice, etc. Students receive financial support, and the study process is adapted according to particular needs. The coordinator identifies the student's special needs and provides recommendations to the CAU regarding the adaptation of the study process. The CAU prepares an individual study plan in accordance with the recommendations.

(2) Expert judgement/indicator analysis

The possibility to make an individual study programme is very convenient for students with special needs. During the site visit the panel had the opportunity to talk to the teaching staff about their experience with disabled students. All confirmed that disabled students have the same conveniences and chances for studying as other students. The laboratories and learning rooms are made accessible to students with various physical disabilities.

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

(1) Factual situation

Student study progress is monitored at all levels. Teachers evaluate students for every course or module and provide feedback both general and individual. Ethics and confidentiality

guidelines are followed when personal feedback is provided. The Study Administration Department monitors progress of students for separate years, ranks the students, and analyses trends. SPC evaluates student study progress at the study programme level. SPC monitors student progress during professional practice, results of final theses, failure rates on courses, etc. All the collected data is used for study programme improvement.

(2) Expert judgement/indicator analysis

The expert panel finds the monitoring of student study progress very well organised. Feedback to students is provided according to procedures approved by the Senate of VU. Students feel very well informed; they get additional information on the study programme, *e.g*. what changes are implemented, based on survey results.

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

(1) Factual situation

Information about the graduate career is tracked by analysis of governmental sources (SODRA, STRATA) and Vilnius University data. Graduates have confirmed that they get multiple questionnaires after graduation. As summarised in the SER (Table 13, page 42), a very high percentage of graduates: 70-100% of 1st or 2nd cycle studies are employed or continue studies. **Representatives of social partners rank the graduates of Genetics study programme very highly; they are in very high demand**. **All employers present in the study programme evaluation meeting agreed on the strengths of the graduates: critical thinking, good practical work skills and theoretical background.**

Information about the possible employment for graduates is provided on Life Science Centre (https://www.gmc.vu.lt/) and Vilnius University (https://www.vu.lt/studijos) websites. This information slightly differs. For the 1st study cycle graduates (https://www.vu.lt/studijos/

stojantiesiems/bakalauro-studiju-sarasas/genetika) Vilnius University Santaros clinics is named as a possible employer. Also in SER (p. 7) it is said that graduates can work in diagnostic laboratories. In the analysis of graduate careers in the SER (p. 43) there are no examples of employment in hospital diagnostic laboratories. The chairman of the study programme committee explained that graduates of the 1st study cycle programme must attend additional courses to get work in diagnostic laboratories.

(2) Expert judgement/indicator analysis

Different information sources that are used for graduate career tracking show a high employment rate. The expert panel suggests unifying and updating information about possible employment after graduation on LSC and VU websites. This would help avoid wrong expectations especially for 1st cycle students regarding the work in medical institutions.

As said above, the representatives from the companies were unanimously very positive about the MSc students that have graduated. They find, however, a **lack of certain academic skills such as scientific writing in English and presentational skills. The technical aspect**

could also be more up-to-date. For instance they would like to see more single cell sequencing. This can maybe be incorporated in the course on big data analysis. Besides this, the social partners would like to have more involvement during more formal sessions on all university programmes.

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

(1) Factual situation

Students and staff must adhere to the Academic Ethics Code of Vilnius University, which defines what constitutes cheating, plagiarism, forgery, bribery, and assisting another in dishonest academic activity. Students who have violated academic ethics may be sanctioned or expelled from the university. During the examination sessions, special appointed invigilators monitor the examination. The VU also has an electronic plagiarism checking system (ESAS) to compare the thesis submitted to any other papers stored in the database. Last but not least, the university has a dedicated hotline that can be used to report violations of academic ethics or the principles of tolerance and non-discrimination. These are treated confidentially and the caller receives assistance from a dedicated team of psychologists and lawyers.

Two cases of academic dishonesty were recorded the last three years, during a remote examination under lockdown conditions due to Covid-19. In one case, the examination had to be retaken under enhanced control conditions, because the student(s) who had committed fraud could not be identified. In the second case, the answers to test questions were published on a Facebook group before the end of the examination. The respective student was accordingly expelled from the VU.

(2) Expert judgement/indicator analysis

The expert panel feels that this is adequate. We do not see room for improvement at this moment.

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

(1) Factual situation

Appeals concerning the assessment of a test can be filed with the life science committee within five working days from the date of publication of the results. Appeals against the decision of the life science committee concerning examination procedure may be filed with the VU Dispute Resolution Committee. No complaints have been received from the students of the genetics study programme in the last five years.

(2) Expert judgement/indicator analysis

In general, the procedure looks good. However, could the life science committee be biased, because they have other tasks as well? One can imagine a different committee, a Board of Examiners, which is independent and does these tasks. It is in place in most Western countries (*e.g.* the UK and NL). The committee suggests taking this into consideration.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Graduates of the genetics study programmes are highly ranked by employers. Employers are satisfied about the good theoretical and practical skills background of graduates.

2. Graduates feel confident with the skills from the study programmes. Critical thinking skills let them quickly adopt new positions.

3. The tight connection between the students and the teaching staff is to be applauded.

(2) Weaknesses:

1. Graduates and employers somehow agree that there could be more practical knowledge in modern analysis methods, big data analysis skills.

2. More attention should be paid to management and grant proposal writing skills of 2nd cycle graduates.

3. Though, in general, the appeal is well-arranged, one could consider instating a Board of Examiners, which is independent and does these tasks.

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

(1) Factual situation

Over the previous three academic years the study field engaged academic staff of 47 to 52 teachers (SER, table 14, p.46). The ratio of teachers to students was very favourable for effective didactic activity and relatively constant, changing from 1:3,2 to 1:3,4 over the period. In the year 2020/21 professors and associate professors represented 50% of the teaching

staff. Teachers with at least 0.5 position and at least 3 years of teaching experience accounted for 86.5% of all teaching staff in the study field. Staff turnover was scarce. Apart from typical reasons like retirement of senior staff or promotion of assistants, a few changes were caused by the necessity of updating/developing new courses, which required lecturers with competences in more recently developed areas of bioinformatics, big data, molecular genetics or synthetic biology.

Most lecturers in the field of genetics are highly qualified. Annex 4 lists all teachers involved in both study programmes over the past 5 years. 79,3% of the listed staff have at least a doctoral degree. This is compatible with information provided in Tables 16 and 17 of SER (p.47), according to which formal requirements concerning academic staff qualifications are fulfilled with a surplus. In particular 69% of staff teaching in the 1st study cycle are researchers, 88% of teachers involved in the 2nd study cycle have a degree, and 50% of them are professors and/or associate professors. The scientific competence of the teaching staff has been commented on in section *3.2.1*. Last but not least 90% of the academic staff who teach in both study fields know English at the level above B1.

(2) Expert judgement/indicator analysis

Analysis of both formal indicators and publication lists shows that the academic staff has sufficient qualifications to ensure the assumed learning outcomes in the first and second study cycles. They are dedicated and very approachable for the students. However, there are no vice coordinators who can take over if something happens to the coordinator. We suggest that these will be appointed in case of an emergency.

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)

(1) Factual situation

According to the SER, mobility of academic teachers is supported both financially and organisationally. Funding for shorter (international conferences, seminars) or longer visits (e.g. internships) comes from external sources (Ministry of Education, Science and Sport, Education Exchange Support Fund) from the VU Erasmus funds as well as from numerous individual research projects. It is worth noticing that younger staff (assistants, junior assistants) took active part in learning visits abroad in the previous years. Academic staff have also lectured at foreign universities under the Erasmus programme; six lecturers undertook this activity over the past three years.

(2) Expert judgement/indicator analysis

The material presented in the SER does not provide information about lengths of particular visits, in particular about factual participation in internships and exchange programs, which are very important for improving research and educational competences on the one hand, but much more difficult to organise on the other hand.

Mobility of the Genetic study field teachers dropped abruptly starting from 2020 due to the pandemic situation, both within Lithuania and abroad, and should be reinstated. This is an important issue because during the site visit the experts heard opinions (mostly from students but also from staff) pointing to superiority of the offered teaching programmes and to self-sufficiency of the VU Genetics study field. Such signs of self-satisfaction are potentially dangerous because they may result in overestimating one's own capacities and, in consequence, in regress.

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

(1) Factual situation

The VU teaching staff may improve their pedagogical competencies via 16 different training programmes offered by VU central administration. The topics cover all important aspects of the teaching process and organisation of laboratory work, and offer 3 to 40 hours of training. They are recorded and available to the academic community. Additionally, five workshops about innovative teaching, learning, and assessment methods were led by guest lecturers from abroad.

Apart from learning visits to other scientific institutions (discussed in *3.5.2.*) invited lectures delivered by international specialists are an important addition to improving scientific competences of the academic staff and to broadening horizons of both staff and students. In 2017-2021, VU academic community could attend 60 lectures given by guest speakers from 18 countries (table 21, p.49), including eight Nobel Prize winners.

(2) Expert judgement/indicator analysis

Each five years the teaching staff is evaluated along the lines of their career going from postdoc to assistant professor to associate professor to full professor. Although the path is clear, it is mostly research based. There are no special tracks for staff that are interested in teaching rather than research. We would like to suggest such a track accompanied by a teaching qualification, the latter of which is usually offered by the university (https://www.universiteitenvannederland.nl/en_GB/utq).

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The team of teachers is up to their task as shown by their individual contribution to scientific journals, membership of international scientific organisations, and research activities.

2. The teaching staff has very good qualifications.

3. HEI creates good conditions to improve the competences of the teaching staff.

4. The content of the bioinformatics course is an example of good practice.

(2) Weaknesses:

1. A special track for teaching should be reconsidered.

2. There are no vice coordinators who can take over if something happens to the coordinator. We suggest that these will be appointed in case of an emergency.

3. Currently, the mobility of teaching staff has dropped to zero.

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

(1) Factual situation

The Genetics study field is implemented on the Saulėtekis Campus, at Saulėtekio str. 7. Since 2016 the new building of the LSC has been in use, which radically changed the conditions of studying. About ¼ of the building cost (which amounted to 41 million Euro), was used to purchase research and educational equipment. The Centre has 24 modern lecture rooms with capacity from 28 to 360 persons, outfitted with all necessary media and equipment used for lectures and seminars, 12 training laboratories which can accommodate up to 24 students each, three computer classrooms and about 30 research laboratories. Laboratories are equipped according to the highest safety standards. Computer classrooms are equipped with personal computers with Windows software while the bioinformatics classroom - with servers with Xeon processors and RAID, and Linux software. The LSC also contains well designed recreation spaces and work rooms for students. A detailed description of the facility including lists of equipment is given in pp 54-56 of SER.

The VU Library consists of two main buildings – the Central Library and the Scholarly Communication and Information Centre, which offer almost 1700 workstations to the users. The LSC reading room, located next to the research and didactics building, operates round the clock, seven days a week. It offers access to more than 8,000 publications in the fields relevant to the Genetics study field. On the contrary, top world textbooks, latest editions of some important textbooks and teaching aids in English are not available because of limited budgets. VU currently subscribes over 90 e-resource databases including 12 databases relevant to the field of genetics. Moreover, expanding subscription to e-books guarantees access to several collections of high quality ebooks from prestigious editing houses. All electronic resources can be accessed through the VU Library website also from home.

As described in the SER, departments and research groups submit applications to the administration for the resources required to conduct studies. The required resources are purchased depending on the available funds. The concrete sums spent on resources have not been quoted in the SER, however no concerns were raised by the involved groups during the site visit. In addition to the central supply of resources, individual funds are provided for students working on their graduation projects – 150 Euro in the 1st cycle and 200 Euro in the 2nd cycle programme.

Research funding (minus field trip costs and publication fees) attracted from various sources, amounted to 818,000 Euro in the years 2017 - 2019. In 2018 - 2019, over 62,000 Euros were obtained from EU Structural Funds for student practice and research.

(2) Expert judgement/indicator analysis

The expert panel feels that this is adequate. We do not see room for improvement at this moment.

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

(1) Factual situation

Resources needed for both study programmes are sufficient. Lecture rooms, laboratories are well equipped. Teachers during the evaluation visit ensured the expert panel that supply of reagents and materials for laboratory activities is sufficient for the study programmes students. Having a better infrastructure for bioinformatics, big data analysis would improve data analysis teaching.

(2) Expert judgement/indicator analysis

The main issues that need improvement have been optimally summarised in section 6.3 of the SER (p. 59) "*More funds should be allocated to updating educational literature in English, acquiring new editions and a larger number of books*."

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. The new Life Sciences Centre building with well-equipped lecture rooms and laboratories.

2. Modern research equipment is available to students during the laboratory work and preparation of final theses.

3. Students and teachers have easy access to scientific literature and to information technologies.

(2) Weaknesses:

1. Classical forms of literature – important contemporary textbooks and, in general, educational literature in English need more attention and financial support.

2. A high performance server would improve teaching of big data bioinformatics.

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

(1) Factual situation

VU has developed and implemented a study quality assurance system in accordance with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (SER, p. 59). University has a quality manual document, which describes quality assurance processes (https://www.vu.lt/site_files/SD/SK/Kokybes_vadovas_2013_10_30_1.pdf).

The SPC is responsible for the quality and constant improvement of the study programmes. It is a complex process where important roles play collection and analysis of feedback from different stakeholders. The fact that the Genetics study programme is one of the most popular in VU illustrates the result of the quality assurance.

Surveys taken are thoroughly analysed using statistical methods. Results are actively used by the SPC to improve the study quality. Many examples of student responses to surveys on the quality of the study programme are provided in the SER, pp. 62-64. Survey result analysis proved that the changes implemented in 2018 increased overall satisfaction of students with the study programme (SER p. 63), especially of the 1st cycle students. Majority of students are satisfied with competent lectures, nice infrastructure, modern instruments and the atmosphere in the Life Science Centre. A similar feedback was also received during the meetings with administration, staff, and graduates.

(2) Expert judgement/indicator analysis

The administration of the LSC and the SER group are concerned about the study programmes quality. Therefore, they do not intend to increase the number of students, which would inevitably sacrifice the quality of the study programme for the quantity of students. Continuous improvement efforts and professional study programme management makes the Genetics study programme very popular. The SPC should now focus on how to keep the study quality level high.

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

(1) Factual situation

The students of the 1st and 2nd study cycle have ample opportunity to hand over their feedback on the skills of the teachers, the content of the courses, and the structure of the curriculum. The lecturers will look at the feedback critically and seriously. For example, the contents of courses on Genotoxicology and Applied Plant Genetics and Genomics were revised during the evaluation period (SER, p. 63). There is an informal and formal communication with alumni and social partners to improve the quality of study programmes. Thermo Fisher Scientific Baltics is the largest social partner,a representative of this company is a member of the SPC who can suggest improvements according to the needs of social partners.

(2) Expert judgement/indicator analysis

The SPC involves students, graduates, and social partners to collect their feedback for improvements. In the expert panel meeting with alumni and social partners, they expressed some ideas on the areas of improvement. Involvement of more stakeholders, more social partners and frequent communication with them would better address changing needs of stakeholders for study program improvement.

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

(1) Factual situation

The VU Study Information System (VUSIS) is used for information management. It contains students' personal data, course evaluations, elective course registrations, final thesis topics, student and study statistics, assessment for courses etc. Surveys of the courses are also integrated in the VUSIS. Results of the surveys are used for the improvement of the study programme. The SPC decisions on study content changes should be publicly available according to study programme committee regulations (article 20; https://www.vu.lt/site_files/SD/Studentams/st._reglamentuojantys_dok/SPK_nuostatai_galutinis_2018.pdf).

(2) Expert judgement/indicator analysis

Survey results are used for the improvement of processes and outcomes. The expert panel was provided with examples of student surveys. Detailed examples of how the survey results helped to improve the study programme are given in the SER, p. 62-63. In the SER and/or publicly available website more information about the changes in study content could be provided.

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

(1) Factual situation

At the end of each semester, which is twice within an academic year VU conducts centralised surveys on specific courses and general satisfaction with study quality (SER, p.62). According to the SER, p. 63, 85% of students participate in these surveys. SPC uses feedback from students for study programme management in discussion with students. Examples of improvement based on the survey results are provided in SER, page 63. These are changes of lecturers for the 1st study cycle programme and improvement of scope and content of courses for the 2nd study cycle programme. The surveys of students showed that 81% of the students in the first cycle of studies and 77% in the second cycle of studies were satisfied with the course content quality.

(2) Expert judgement/indicator analysis

Overall student satisfaction about 80% can be considered as good. In the meeting with students there was a different opinion on study subjects between 1st and 2nd study cycles. The 1st cycle students felt stressed about getting an internship position. Graduates of the 2nd study cycle in general felt very positive about the quality of their studies.

Strengths and weaknesses of this evaluation area:

(1) Strengths:

1. Efficient involvement of students and other shareholders in the improvement of the study programme.

2. Attitude of the study programme management towards the quality of the study programme. There is a clear goal to focus on the study quality.

(2) Weaknesses:

1. The SPC could be described in SER to understand how many members and which stakeholders are involved in the study programme committee.

2. Quality guidelines, SPC decisions on study content changes could be communicated more clearly and publicly.

IV. EXAMPLES OF EXCELLENCE

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

Several examples of excellence can be found in the Genetics study programme. **The leading idea**, unifying these examples, is **to create exceptional conditions for studying**. They all can be seen in the activity of the team who invented, organised and currently execute the programme.

The key characteristic of the programme in that respect is the **exposure of all students to extensive laboratory work,** hand in hand, and at the same workbench with the mentor. No better method has been invented so far to train not only a skilled and knowledgeable professional, but also to develop his or her imagination, creativity and ability of working in a team. **The effects of broad inviting students to the real world of science making are clearly visible in the success achieved by Genetics students and graduates in many areas.** It has to be stressed, however, that the method implemented in both study cycles is very demanding to the teaching team, and requires special devotion, much investment of their talents and time, not to mention being a good scientist, which is a self-evident pre-requisite. The teaching staff active in genetics evidently fulfils all these conditions.

The second aspect is the **exceptional material basis for studying**. Here, the modern Life Sciences Centre has to be mentioned. Even though efforts of many more people and institutions were necessary to establish the centre, **the planning and implementation of such a project always requires a huge commitment of time and creativity of future users**. Finally, more time and creativity are necessary to fill the laboratory space with big and small equipment and materials indispensable for teaching. At least part of the resources used by the students is in place due to proficiency and hard work of their teachers devoted to generating funding via scientific projects.

V. RECOMMENDATIONS*

Evaluation Area	Recommendations for the Evaluation Area (study cycle)
Intended and achieved learning outcomes and curriculum	• There is limited use of English in the courses and theses. The 2nd cycle thesis for instance could be written in English. • To have one practical internship for a maximum of six months for 2nd cycle students limits the students in their primary goal of finding a research position. Therefore, we suggest that there should be two Msc internships to be fully prepared for the next step. • During the regular studies, a mentor could be useful not only in the context of internships, but also give advice during the rest of the studies. • There should be more choice in electives. • The balance between compulsory and elective needs to be revised and brought up-to-date.
Links between science (art) and studies	• More laboratories of social partners should be available for preparation of students' final theses. • Modern technologies (big data generation and analysis, omics technologies) should be better represented during internships and final thesis preparation in the 2nd study cycle programme.
Student admission and support	• In case a first cycle student wants to take part in a mobility programme, VU should give the student a guarantee that leaving abroad will not negatively impact their lab placement where they chose to do their bachelor thesis. • There should be more time dedicated to the career centre and to the information about practical work (where/who/what?).
Teaching and learning, student performance and graduate employment	• Unify and update information available on the possible employers after graduation provided on LSC and VU internet pages. • One could consider instating a Board of Examiners, which is independent. • The social partners would like to have more involvement during more formal sessions on all university programmes.
Teaching staff	• A special track for teaching should be reconsidered. • There are no vice coordinators who can take over if something happens to the coordinator. We suggest that

	these will be appointed in case of an emergency. • Academic mobility of teaching staff has to be restored.
Learning facilities and resources	• More attention and financial support are necessary to purchase important contemporary textbooks and, in general, educational literature in English. • A high performance server would be essential to improve teaching of big data bioinformatics.
Study quality management and public information	• Involve more social partners in constant communication to have up to date demands of industry needs. • Publish the study programme committee decisions on study content changes • Provide study programme committee composition in the SER.

VI. SUMMARY

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

The following is a summary of the findings of the expert panel based on the Self-Evaluation Report (SER) and the interviews with the administration (senior management and faculty administration staff), staff responsible for the preparation of the SER, teaching staff and stakeholders (students, alumni, employers, social partners). The expert panel gives a **positive** evaluation to the implementation of the study field of Genetics, 1st and 2nd cycle with 5 evaluation areas assessed as very good, area No3 (Student admission and support) as good, and area No6 (Learning facilities and resources) - as excellent.

The Genetics study field encompasses a 1st cycle and a 2nd cycle study programme. Both programmes are designed to train graduates able to develop successful national and international careers in a wide range of professional areas, at medical and agricultural research institutions, as well as in biotechnological and pharmaceutical companies. The evaluated study field has a very high reputation among students, alumni and employers.

The learning outcomes are clearly specified and they match the study field aims. They are achieved by starting from various broad courses for the 1st cycle students, followed by more specialised courses in both study cycles. The curricular structure ensures the appropriate sequencing of courses. However, more electives are required to complete the curriculum. The choice of electives has to be broader for both cycles, and the balance between compulsory and elective courses needs to be revised.

The procedure of preparing and defending the final theses, both Bachelor's and Master's is well organised. However, the use of English in the theses is limited, which does not comply with an international component of the genetics studies clearly expressed by the HEI. Thus the expert panel suggests that the 2nd cycle thesis could be written in English, and the 1st cycle thesis written in Lithuanian should contain an extensive summary in English. Besides, more professional courses taught in English would be advisable.

The teaching staff is deeply involved in research, in most cases directly related to the study programme. Professors and lecturers actively participate in numerous national and international scientific projects. This provides an opportunity to involve students in national and international research activities. The research work in scientific laboratories is mandatory for all students of the study field regarding the final thesis preparation, however, the interested individuals are invited to the labs even much earlier. This is reflected in a lively scientific activity of both cycle students, and an impressive number of co-authorships in conference communications and publications. The involvement of students in the genuine research, and the willingness of the staff to support it, which implies much work not necessarily included in teachers' evaluation, make together a particular strength of the Genetics study field.

Irrespective of numerous contracts signed by the university with foreign institutions within and beyond the Erasmus program, international mobility of students is low and recently it collapsed dramatically due to pandemic restrictions. As mobility is important for opening the students' horizons, it should be taken care of seriously. In particular, it would be good to rethink the system of lab placements for 1st cycle students, so that they are not afraid of going abroad. Also the number of international students in the 2nd cycle programme should be increased.

The teaching takes place in the 6-year-old Life Sciences Centre. The facilities for lectures, laboratory work and especially practices are sufficient in quantity, size and modern equipment. The laboratories meet highest international standards and highest safety standards. During internships students are also trained at modern equipped scientific laboratories that meet the highest international standards. The library operating 24/7 offers a variety of learning resources, including databases relevant to the field of genetics, numerous scientific journals and e-books.

The structure of genetics studies enables the students to develop important competencies, analytical thinking and communication, which are crucial to success in the labour market. This is another strength of the evaluated programmes. Nevertheless, from graduates and employers point of view, more practical knowledge of modern analysis methods, big data analysis skills, as well as project writing and management skills would be desirable for the 2nd cycle graduates.

The programmes are run and administered in a professional manner. The responsibilities for decisions and monitoring the implementation of the programme are clearly allocated. Also an enthusiastic and family-like atmosphere, as observed by teachers and students alike during the site visit speaks for good management and general satisfaction. Students and other stakeholders are involved in continuous improvement of the programmes, however quality guidelines and SPC decisions on study content changes could be communicated more clearly and publicly.

The members of the evaluation panel wish to thank the academic staff of Vilnius University for preparing the professional Self-evaluation Report. We are also thankful for organising the fruitful site visit, lively discussions and for the particularly open and friendly atmosphere.

Expert panel chairperson's signature:
Prof. dr. Halina Gabryś