

APPLICATION

Study field "Agriculture, Forestry, Fishery, and Food Hygiene" for assessment

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
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Self-evaluation report

Study field "Agriculture, Forestry, Fishery, and Food
Hygiene"

Latvijas Lauksaimniecības universitāte

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I - Information on the Higher Education Institution/College

1.1. Basic information on the higher education institution/ college and its strategic development directions, including the following information:

Latvia University of Life Sciences and Technologies (LLU) is the fourth largest university in Latvia (established in 1936 as an independent higher education institution) which implements studies and research for various industries of the national economy and which has developed relevant educational and research competence and expertise in:

- the following unique fields: agriculture, forestry, veterinary medicine, food technology and landscape architecture;
- the following universal fields: information technology, economics and social sciences, agricultural engineering, environmental sciences, civil engineering and pedagogy.

LLU:

Vision - Latvia University of Life Sciences and Technologies is one of the leading science and technology universities of the Baltic Sea region, with a specialisation in the sustainable use of natural resources to improve the life quality of society.

Mission - to build internationally competitive intellectual potential based on excellence in research, application of research results in the national economy, high quality of studies and effective university management.

LLU long-term goals:

1. Excellence in research that promotes technology and innovation and is integrated into the study process.
2. High-quality studies that provide the development of internationally competitive specialists.
3. Effective university management that ensures the targeted and efficient use of resources for high-quality studies and excellence-focused research.

LLU medium-term objectives are subordinated to the vision, the mission and the long-term goals and are as follows:

1. Excellence in research.
2. Application of research results in the national economy (research results are understood to mean the university's knowledge, technology and innovation accumulated and generated).
3. Integration of studies and research.
4. Internationalisation of studies and lifelong education.
5. High quality and competitive studies that meet the current demand.
6. Diversified supply of lifelong education that meets the current demand.
7. Effective university management at all the levels.

The LLU Development Strategy for 2015-2022 (<https://www.llu.lv/index.php/en/mission-and-vision>) prescribes three action programmes with relevant targets to achieve the long-term goals:

1. Research Programme;
2. Education Programme;
3. Management Programme.

LLU is comprised of the following eight faculties:

1. **LF** - the Faculty of Agriculture (established in 1863);
2. **VMF** - the Faculty of Veterinary Medicine (established in 1919);
3. **MF** - the Forest Faculty (established in 1920);
4. **TF** - the Faculty of Engineering (established in 1944);
5. **VBF** - the Faculty of Environment and Civil Engineering (established in 1947);
6. **PTF** - the Faculty of Food Technology (established in 1948);
7. **ESAF** - the Faculty of Economics and Social Development (established in 1968 as the Faculty of Agricultural Economics; in 2013, the Faculty of Economics merged with the Faculty of Social Sciences);
8. **ITF** - the Faculty of Information Technologies (established in 2001).

Totally, the Faculties of LLU implement 61 study programmes within **14** study directions (as of October 1, 2020).

Number of students and programmes in LLU study directions

B - bachelor programmes; M - master programmes; D - doctoral programmes

No	Study direction	Number of programmes				Number of students (01/10/2020)	Faculties
		Total	B	M	D		
1	Agriculture, Forestry, Fishery, and Food Hygiene	12	6	3	3	1,140	LF, MF, VMF
2	Architecture and civil engineering	9	5	2	2	434	VBF
3	Production and processing	8	4	2	2	443	PTF, MF, TF
4	Information technology, computer engineering, electronics, telecommunications, computer management and computer science	4	2	1	1	286	ITF
5	Environmental protection	3	1	1	1	98	VBF
6	Health care - a joint programme with LU and RSU	1		1		22	PTF
7	Mechanics and metal working, heat power engineering, heat engineering and mechanical engineering	6	4	1	1	272	TF
8	Power industry, electrical engineering and electrical technologies	1	1			85	TF

No	Study direction	Number of programmes				Number of students (01/10/2020)	Faculties
		Total	B	M	D		
9	Sociology, Political Science, and Anthropology	2	1	1		68	ESAF
10	Economics	3	1	1	1	389	ESAF
11	Management, administration and real estate management	5	2	3		342	ESAF
12	Hotel and restaurant service, tourism and recreation organisation	1	1			141	PTF
13	Internal security and civil defence	1		1		53	MF
14	Education, pedagogy and sports - the direction to be closed in 2023	5	2	2	1	118	TF
Total		61	3 0	1 7	1 2	3,891	

LLU personnel, job positions and age group statistics information are in the table.

LLU personnel, job position and age group statistics (as of October 1, 2020)

	Total	incl. women
University personnel	957	652
incl. academic staff members who have been elected at LLU	305	190
professors	57	33
associate professors	53	36
assistant professors	64	47
lecturers	40	30
assistants	0	0
leading researchers and researchers	91	44

Academic staff members – professors, associate professors, assistant professors, lecturers or assistants – who are also elected as leading researchers and researchers	156	105
Other personnel	652	462
Academic staff who have not been elected at LLU (visiting professors, visiting assistant professors, visiting lecturers)	253	153
of which foreign visiting professors, visiting assistant professors, visiting lecturers	21	4
Distribution of <i>academic staff members</i> by age:		
under 25 years	0	0
25-29 years	4	3
30-34 years	21	12
35-39 years	49	24
40-44 years	39	28
45-49 years	46	32
50-54 years	30	24
55-59 years	31	23
60-64 years	41	26
65 years and over	44	18

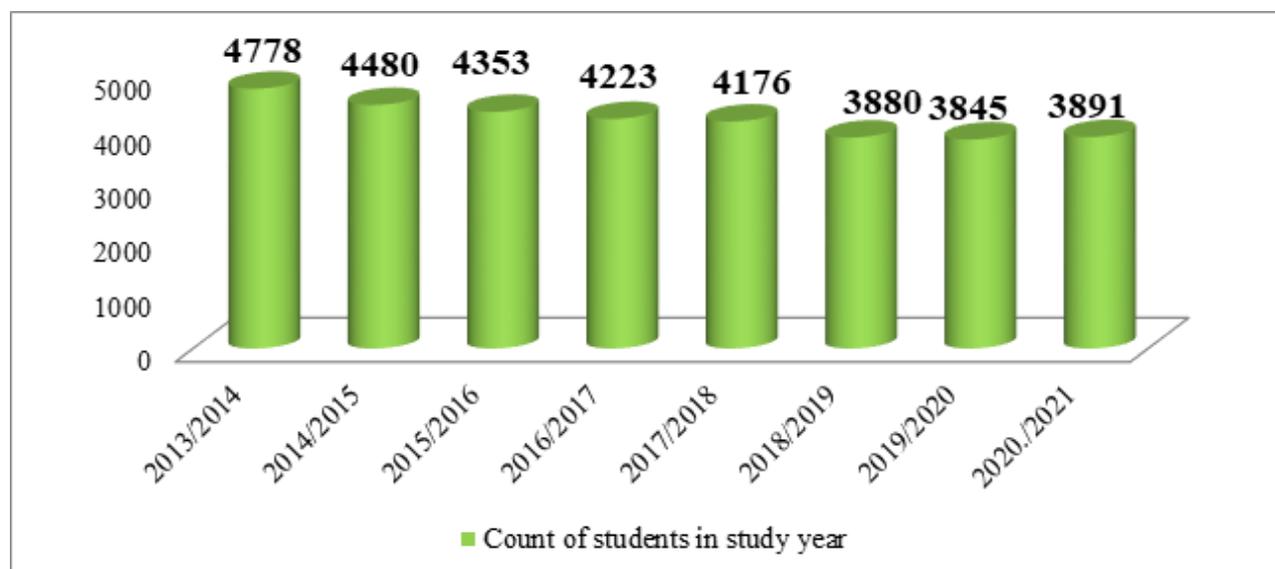
227 members of the total academic staff have a scientific degree (74.43%).

LLU promotes and supports the engagement of young teaching staff in academic work. Of the current academic staff, 52% are less than 50 years old, 33% are from 50 to 65 years old and only 14% are over 65 years old.

Changes in the number of students at LLU in the period 2013-2020 (October 1 of each year)

In the period from the academic year 2013/2014 to the academic year 2020/2021, the total number of students accounted for more than 4,000. The decrease in the number of students over the six-year period reflects overall negative demographic trends concerning natural increase of population and migration. The total number of students at LLU decreased by 18% over the six-year period, yet a positive fact is that the number of students tends to remain stable in last years. Overall, the total number of students was affected by the processes occurring in the country: 1) the number of individuals who finished the secondary school decreased by 20% in the reference period; 2) the

number of individuals who finished their secondary school and continued their education at university was very volatile from year to year: a 5% decrease in 2015 and 2017 and a 1-2% increase in 2014 and 2018. Currently (in 2020), the number of students has levelled off, and there has even been a slight increase in the total number of students studying at LLU compared with the previous year.



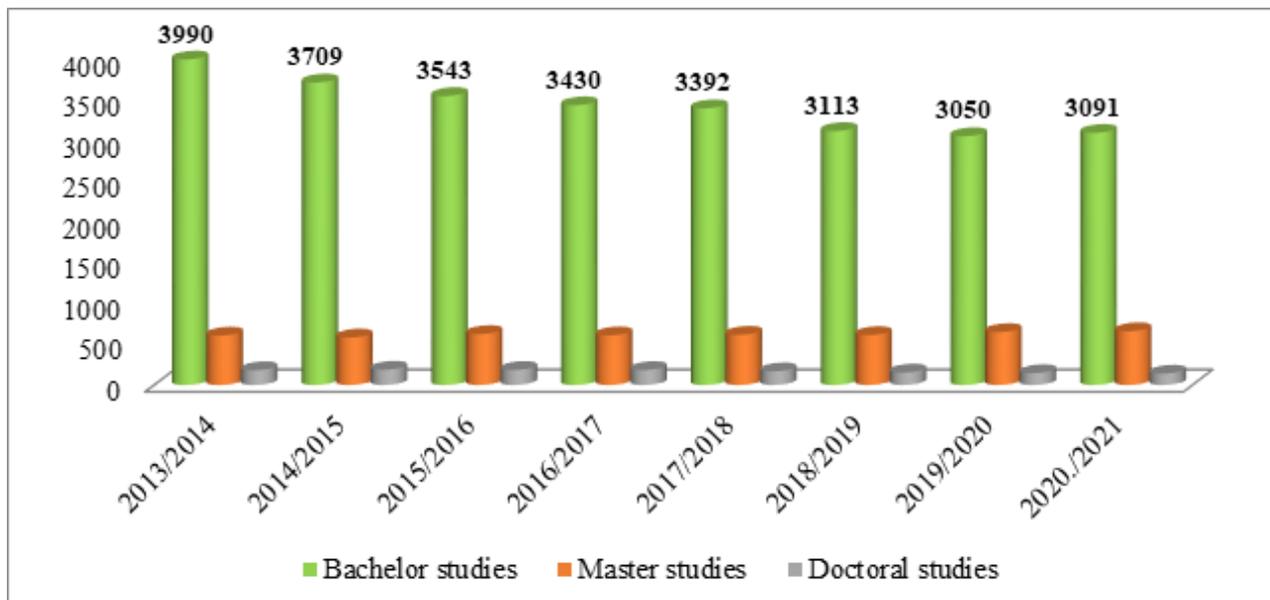
After the university had succeeded in tackling with the external factors affecting the number of students, a number of reasons for the decrease in the number of students were established; the reasons were identified from the analysis of the matriculation of students.

The major reasons are as follows:

1. There was a considerable increase in the amount of students who discontinued their studies during the first semesters owing to the wrong study programme or study direction chosen, their jobs or private life problems;
2. Some students could not continue their studies because of financial problems or due to the schedule requirements (especially working part-time students), since they could not combine studies with their working hours;
3. Master's degree students were unable to combine studies with their jobs;
4. Interest in doctoral studies tended to decrease because financial support for doctoral students was insufficient (a monthly scholarship determined by the state was EUR 113.83), and the availability of funding for research was limited.

The distribution of the number of students by level of studies at LLU in the reference period was as follows:

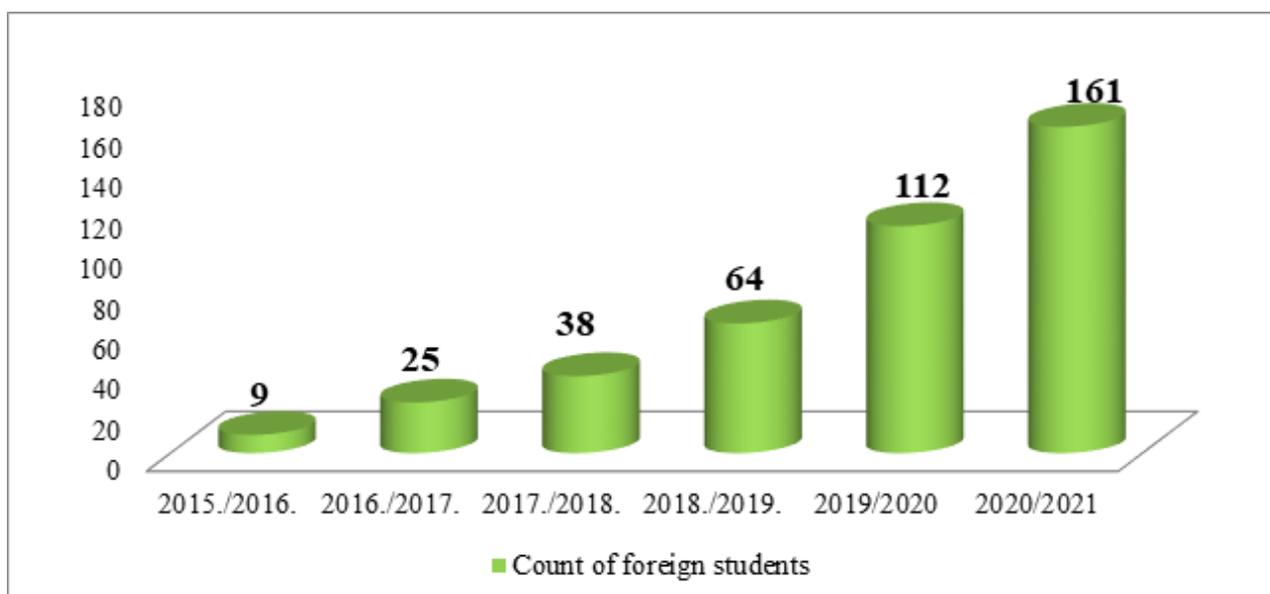
1. Bachelor's degree studies - 79-84%;
2. Master's degree studies - 13-17%;
3. Doctoral studies - 4%.



The analysis of changes in the number of students distributed by level of studies allows concluding that the numbers of undergraduate and doctoral students were the most volatile (a negative trend). The decrease in the number of undergraduate students could be rationally explained as follows: over the six-year period, several study programmes were consolidated; the regional affiliates of LLU were closed; the decrease in numbers of part-time students was observed in particular. The decrease in the number of doctoral students could be explained by the insufficient amount of funding allocated to science and research as well as the fragmented nature of that funding.

Main activities implemented by LLU to increase its number of students:

1. In the academic year 2015/2016, LLU began admitting international students for studying in English. Thus 161 international students studied at LLU in 11 study programmes (at all the levels of studies) in the academic year 2020/2021.



2. Students are given an opportunity to acquire a bachelor's degree of social sciences in sociology in the form of e-studies.
3. As regards the conventional study process, teaching staff members use the Moodle online system intensively as a support tool for e-studies (learning materials, multiple choice tests, tests, homework etc.);
4. Infrastructure for studies and research has been improved and modernised.

5. Opportunities to receive scholarships funded by patrons tend to increase.
6. LLU provides doctoral students with internal research grants.

Research activities and motivation measures for the academic staff are defined in the LLU Development Strategy, the relevant targets set have to be achieved by the Faculties, administrative centres and scientific institutes and laboratories. Each organisational unit of LLU approves these plans for an annual period. The decision-making bodies of the organisational units have to approve the targets set and the procedure to achieve the targets. Each organisational unit collegially reports on the progress to the LLU Rectorate, and the details of the implementation of the plans are published on the LLU intranet: <https://mans.llu.lv/lv>, they and are available to the academic staff and students.

1.2. Description of the management of the higher education institution/ college, the main institutions involved in the decision-making process, their composition (percentage depending on the position, for instance, the academic staff, administrative staff members, students), and the powers of these institutions.

The following key (collegial) institutions are involved in making **strategic decisions** at LLU:

The **Council** is a supreme collegial representation, management and decision-making body for academic and scientific matters authorised by the personnel of LLU.

The **Council**:

- approves and amends the Constitution of LLU;
- elects and dismisses the members of the Senate of LLU;
- elects and dismisses the rector of LLU;
- elects the Academic Arbitration Court of LLU and dismisses its members;
- hears reports by the Senate, the Rector and the Academic Arbitration Court;
- approves and amends regulations on electing the Council, electing and dismissing the Rector and the statutes of the Senate and the Academic Arbitration Court;
- discusses and makes decisions on conceptual matters on the performance and development of LLU.

The Council is composed of 240 members who are elected by the organisational units of LLU by secret ballot for three-year terms in the following composition:

- 160 academic staff (67%);
- 50 students (21%);
- 30 other personnel (13%).

The Council functions in accordance with its Statute <https://www.llu.lv/lv/konvents> (only on Latvian)

The **Senate** is a collegial management and decision-making body of the personnel of LLU, which approves the rules and regulations that govern all the spheres of LLU activity, with the exception of those that fall within the remit of the Council in accordance with the Constitution of LLU.

The Senate is approved by the Council for a period of three years. The Senate consists of 60 senators, of which:

- 41 are representatives of academic staff who represent all the Faculties (68%);

- one representative of other personnel (2%);
- the Rector of LLU, the Vice-Rectors for studies and science and the chair of the Council as representatives of academic personnel, the director and the Chancellor of LLU as representatives of other personnel (10%);
- 12 representatives of students who have been nominated by the Student Self-government (20%).

The Senate functions in accordance with its Statute <https://www.llu.lv/lv/senats> (only on Latvian)

Regulations, decisions and procedures in relation to the matters pertaining to the basic activity of LLU are also passed, within the scope of competence, by:

1. Rector;
2. Vice-Rectors for studies and science;
3. Chancellor;
4. Director;
5. Deans of the Faculties.

Annex 1 - List of main internal documents of LLU.

Annex 2 - LLU Management Structure.

1.3. Description of the mechanism for the implementation of the quality policy and the procedures for the assurance of the quality of higher education, as well as the stakeholders involved in the development and improvement of the quality assurance system and their role in these processes.

Quality management system at the University.

The quality management of study processes is part of the overall quality management system of LLU. Since 2016, the quality management system of LLU has been based on the international standards for excellence (see Investors in Excellence Standard, www.investorsinexcellence.com).

The quality management system of LLU is externally audited every two years (audits may be done by the organisations recognised by the Investors in Excellence organisation, which either grant or do not grant an Investors in Excellence certificate to the organisation audited). Such a certificate was granted to LLU both in 2016 (the first audit) and in 2018 (the repeated audit).

The quality management system of LLU is part of the overall LLU Development Strategy and covers a broad spectrum of matters. A short general description of the LLU Quality Management System and the Quality Assurance Plan is available at <https://www.llu.lv/index.php/en/mission-and-vision>

Quality management system in the context of studies

LLU has developed a detailed joint scheme of study processes that includes 90 major study processes, their sequence and interaction. Each of the 90 processes is described and arranged sequentially. The description contains the following parts: activities; responsible organisational units and employees; reference to the legislative or regulatory framework governing the activities. The detailed joint scheme of study processes provides a common approach to study processes across all the organisational units.

The descriptions of quality of studies at LLU are restricted access documents and are intended for

internal use at LLU as well as are part of the management and strategic documents of LLU. The detailed information on the internal quality management system and its effectiveness is contained in Section 2.2 of the self-assessment report where the quality management system is described, assessed and defined in the context of a particular study direction.

The characteristics of stakeholders and their role in the development and improvement of quality assurance system.

The quality management system of LLU covers all the spheres of LLU activity. The academic staff and other personnel of LLU are involved in the quality management system. The coordinating body of the quality management system is the Administrative Centre of LLU, which is subordinate to the Rector.

1.4. Fill in the table on the compliance of the internal quality assurance system of the higher education institution/ college with the provisions of Section 5, Paragraph 21 of the Law on Institutions of Higher Education by providing a justification for the given statement. In addition, it is also possible to refer to the respective chapter of the Self-Assessment Report, where the provided information serves as evidence for the full compliance, partial compliance or non-compliance.

1.	The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.	Complies Investor in Excellence certificate issued in 2016 Detailed information is provided in Section 1.3 of the report
2	A mechanism for the creation and internal approval of the study programmes of the higher education institution/ college, as well as the supervision of their performance and periodic inspection thereof has been developed.	Complies New study programmes are developed in accordance with the Regulation on Study programme Development, Approval and Amendment at LLU (No. 10-5 as of 13 March 2019) approved by the Senate. The Regulation stipulates that: 1. A programme shall be developed by a Faculty, discussed by the Methodological Commission of the Faculty and approved by the Board of the Faculty; 2. The programme developed shall be discussed by the Board of Studies and recommended for approval by the Senate; 3. The Senate shall approve the programme and a director for the programme; 4. Relevant documents shall be submitted to the Academic Information Centre for being licensed; 5. New students shall be admitted to LLU and enrolled in the programme after the licence has been granted. Every year, annual reports are drawn up for all study programmes; the reports are approved by the Senate and published on the LLU website https://www.llu.lv/lv/studiju-virzienu-parskati-un-pasnovertejuma-zinojumi (only in Latvian)

3.	The criteria, conditions, and procedures for the evaluation of students' results, which enable reassurance of the achievement of the intended learning outcomes, have been developed and made public.	<p>Complies</p> <p>The students' learning outcome assessment system is described in:</p> <ul style="list-style-type: none"> • Regulation of Studies (bachelor's and master's degree studies). • Regulation of Doctoral Studies. <p>The requirements for assessing students' learning outcomes for each particular course are given in the descriptions of course study programmes available in Latvian and English in the LLU IS course register at https://lais.llu.lv/pls/pub/kursi.startup?l=1</p>
4.	Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.	<p>Complies</p> <p>LLU has developed procedures and regulations (approved by the Senate) to guarantee the qualifications and work quality of academic staff:</p> <ol style="list-style-type: none"> 1. The LLU Regulations on Academic Positions (File in the attachments section in the folder "LLU Documents in English"). 2. The Regulation regarding the Calculation of Academic Workload (File in the attachments section in the folder "LLU Documents in English"). 3. The Motivation System for LLU Academic Staff (File in the attachments section in the folder "LLU Documents in English"). 4. Classes for students are scheduled in accordance with the procedures approved by the Rector: classes are scheduled in a centralised way for full-time studies, while for part-time studies it is done by each Faculty. The schedules are publicly available two weeks before the beginning of a semester (for part-time studies - before the beginning of the examination period).

5.	The higher education institution/ college ensures the collection and analysis of the information on the study achievements of the students, employment of the graduates, satisfaction of the students with the study programme, efficiency of the work of the academic staff, the study funds available, and the disbursements thereof, as well as the key performance indicators of the higher education institution/ college.	<p>Complies</p> <p>LLU uses an information system that aggregates information about the entire study process of each student (decisions regarding the student, grades earned, payments made). Every semester, a survey of students is conducted to find out students' opinion regarding the courses taken, satisfaction with the way the courses are organised, the content of the courses, the teaching staff delivering the courses (an electronic questionnaire). The survey results are available to each teaching staff member, directors of study programmes, department/institute directors, deans of the Faculties and the Vice-Rector for studies.</p> <p>For financial planning and accounting, LLU employs the accounting system Horizont that is a single system connected with the Ministry of Agriculture. The achievement of the goals and targets set by the LLU Development Strategy is reported each year at different levels:</p> <p>Faculties - during the dean's office meetings; Administrative units - at the Board of Studies; The Vice-Rectors, the Chancellor and the LLU Director - during the Rectorate meetings; The Rector - during the Council meetings.</p>
6	The higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their quality assurance systems.	<p>Complies</p> <p>Reports of the study directions are produced every year, reviewed by the Board of Studies and approved by the Senate. Once approved, the reports are made public on the LLU website - https://www.llu.lv/lv/studiju-virzienu-parskati-un-pasnovertejumazinojumi (Only in Latvian)</p>

II - Description of the Study Direction (1. Management of the Study Direction)

1.1. Economic and/or social grounds for the creation of the study direction and the relevant study programmes, the assessment of the interrelation among the study programmes, as well as the analysis of the significance (singularity) of the study programmes in comparison with other similar study programmes in Latvia and abroad.

The economic and social substantiation of programmes included in the study direction "Agriculture, Forestry, Fishery, Veterinary Medicine and Food Hygiene" is determined by the strategic documents of Latvia and the European Union.

In terms of hierarchy, the highest level of national document in mid-term planning is "National

Development Plan 2014 - 2020" (NAP2020) (<https://www.pkc.gov.lv/lv/attistibas-planosana-latvija/nacionalais-attistibas-plans/nap2020>, in Latvian) with one of priorities being "Development of national economy" with activity direction "High-yield and Exportable Production and Internationally Competitive Services" and the priorities in the National Development Plan 2021 - 2027 (NAP2027) (https://www.pkc.gov.lv/sites/default/files/inline-files/NAP2027_ENG.pdf) Knowledge and skills for personal and national growth with two action lines "Science for the development of society, the economy and security" and Quality, accessible and inclusive education and Quality Living Environment and Regional Development with the action direction "Green Deal" is unimaginable without educated, highly qualified specialists who determine development of study direction and further progress.

One of priorities of the sustainable and integrative development strategy of the European Union "Europe 2020" is development of knowledge- and innovation-based economy (https://ec.europa.eu/info/strategy_lv); General Agriculture Development Policy (KLP) supports market-centred agriculture industry, which provides available, safe and good quality food, which has been produced with sustainable methods according to standards and requirements (animal well-being, environmental protection, food safety etc.); the goal of elaborated EU Forest Strategy and Latvian Forest Policy is to ensure a balanced development of multifunctional forest and efficient use of resources, sustainable (non-depleting) management of forest and its resources; there are several activity directions defined in the master document of Latvian forest industry Basic Guidelines for Development of Forest and Related Industries 2015-2020 (1) sustainable forest management, (2) development of forest competition, (3) development of forest industry science and education. These documents define the relevance, development and further progress of programmes included in the study direction.

A need for knowledge acquired in the study direction is defined also by a document elaborated by the Ministry of Agriculture Latvian Rural Development Plan 2014 - 2020 (<https://www.zm.gov.lv/zemkopibas-ministrija/statiskas-lapas/latvijas-lauku-attistibas-programma-2014-2020-gadam?id=20631#jump>, in Latvian) where lack of qualified specialists in agriculture and forestry fields, a need for advisers, improvement of primary producers' competition etc. are specified.

The order of the Cabinet of Ministers No. 746 "On Priority Directions in Science 2018-2021" (<https://likumi.lv/ta/id/295821-par-prioritarajiem-virzieniem-zinatne-2018-2021-gada>, in Latvian) determines priority directions (1) research and sustainable use of local natural resources for development of knowledge-based bioeconomy, (2) climate changes, nature protection and environment play a decisive role in study direction and research.

LLU, together with scientific institutes, has created a strategic union of Bioeconomy Research, with the main goal - to elaborate and implement development strategy for science in Latvia in area of bioeconomy to improve the performance of innovations in bioeconomy industries and competitiveness at regional and international scale and Latvia's contribution to attainment of common EU goals. Latvian Bioeconomy Strategy 2030 (https://www.llu.lv/sites/default/files/2018-07/Bioeconomy_Strategy_Latvia_LV.pdf, in Latvian) was elaborated by a work group with participation of study direction's academic staff members and scientists. In order to attain the strategy's goals, engagement of all industries is required, and this principle is integrated in study direction's process and scientific activity.

Previously mentioned strategic documents define a need for interdisciplinary knowledge, which is the basis of the study direction.

The study direction includes ten study programmes which provide succession. Study programmes

have been elaborated to give a choice – to focus on professional or academic study programmes, at the same time following one cycle – Professional Bachelor’s study programme “Agriculture”, academic Master’s study programme “Agriculture” and doctoral study programme “Agriculture”; academic Bachelor’s study programme “Forestry” and professional Bachelor’s study programme “Forest Engineer”, academic Master’s study programme “Forestry” and doctoral study programme “Forestry”; professional Master’s study programme “Food Hygiene”, as well as academic Bachelor’s study programmes “Sustainable Agriculture” (Sustainable Agriculture) and “Sustainable Forestry” (Sustainable Forestry).

Higher education in this study direction can be obtained only in Latvia, in LLU faculties of Agriculture, Forestry and Veterinary Medicine. Thus, existence and development of study programmes serves interests of the State.

Professional Bachelor’s study programme “Agriculture” was created on the basis of experts’ recommendations in previous accreditation, preparing top level and widely educated agriculture specialists for the industry with skills and competences necessary for professional activities and capable of using insights of the modern science in developing production technologies, to comprehend the role of sustainable agricultural production and unity with environment, to independently acquire the necessary practical skills in a particular specialisation direction and to continue studies in the graduate programme.

The study programme was compared to two other undergraduate programmes in Finland – Helsinki University (HU, *University of Helsinki*, study programme Bachelor of Agricultural Sciences and Seinäjoki University of Applied Sciences (SeAMK, *Seinäjoki University of Applied Sciences*, study programme *Bachelor of Natural Resources*). **In common:** all compared study programmes – study programme includes generally educative and specialisation courses, traineeships and Bachelor thesis, and a possibility to continue studies in the graduate programme (LLU LF and SeAMK). **Differences:** both Finnish Universities deliver academic Bachelor’s study programmes, study duration and form (LLU LF 4 years in full-time and 5 years in part-time studies, HU 3 years of full-time studies, SeAMK 4 years of full-time studies and 6 years of part-time studies), one of specialisation directions, Manager of Agricultural Enterprise, is offered by LF but not by HU universities, while Bachelor thesis in HU is elaborated on the basis of scientific literature.

The academic Bachelor’s study programme Forest Science is elaborated to ensure acquisition of fundamental and theoretical knowledge of the industry and prepare for the graduate studies.

The academic Bachelor’s study programme is compared to programmes in Forestry Department of the University of Freiburg and Forest Faculty of Vytautas Magnus University Agriculture Academy. The volume of courses, study direction in the mentioned programmes is similar and mutually comparable. **In common:** A list of study courses and their volumes, connection among lectures, applied and laboratory works in University of Freiburg are very similar. **Differences:** organisation of study process in the University of Freiburg (courses are acquired in cycles lasting for 1-3 weeks according to a subject system, followed by tests). Study volume (it is larger in Lithuania, 181.5 credits); Lithuania has larger study volume and production traineeships, as well as larger volume of electives, the programme has several courses which are not offered by LLU.

The content of professional Bachelor Study Programme Forest Engineer was created taking into account profession standard and recommendations provided by the Councillor Convent, as well as referring to the experts’ recommendations from previous years. The goal of the programme is to prepare comprehensively educated specialists with independent mind-set for forest management, who are able to use modern information services and apply the latest scientific findings to improve the industrial manufacturing technologies, understand production process and

its unity with environment, ensuring sustainable and rational forest management, preserving and increasing of their values and developing unconventional ways to use the forest resources in wide range. The programme can be partially compared to higher educational institutions of EU. An offer from foreign universities can be mainly associated with forestry where technical and technological issues, which are integral part of the programme, are not discerned individually. The study programme is compared to the Swedish University of Agricultural Sciences and Czech Mendel University. **In common:** The volume of study programme in Sweden is 180 credits (4 years), whereas 3 years in Czech Republic, the courses are mainly related to forestry (without discerning elaboration, work methods and technologies individually), elaboration of Bachelor thesis. **Differences:** The programme in Sweden is delivered in English, generally educative courses are integrated according to the description available. The programme in the Czech Republic is delivered in Czech language. Studies in English are offered in the Czech Republic only starting with the graduate programme.

The content of academic Bachelor's study programme Sustainable Agriculture was created, taking into account the content of the science of agriculture and needs and specifics of agriculture as production industry not only in Latvia, but also the European Union, and also on the basis of the strategic goals proposed in LLU. Comparison of the programme to those delivered by universities/colleges of other European Union countries can be carried out only partially, because in the universities in question both plant and animal production directions are rarely offered in one study programme. The new programme is rooted in historically developed agricultural education in Latvia, which could spark additional interest among potential students. It is unique also because it will be offered in English. For example, in Estonia, Lithuania and Finland, the academic Bachelor's study programmes (3 years) are delivered in local languages. LLU cooperation universities were chosen for comparison – the University of Helsinki (study programme – Bachelor of Agricultural Sciences and Estonian University of Life Sciences in Tartu (programme Production and Marketing of Agricultural Products). **In common:** The study process is organised as lectures, seminars, practical works and laboratory works. Both oral and written tests are intended. There are final or cumulative examinations. The University of Helsinki offers specialisation in field crops, horticulture or animal husbandry. The academic staff members, besides their work in studies, conduct also scientific research which is a basis for the industry's theoretical and specialised courses offered. Confers Bachelor's degree in Agriculture. **Differences:** Undergraduate studies in the selected countries are compared only if delivered in national language. The Estonian University of Life Sciences does not provide specialisation or there is a limited choice when elaborating the Bachelor thesis. Courses with less volume of credits can be merged in modules. Traineeships are planned at less volume in credits, or there are no traineeships at all. Different conditions to receive Bachelor's diploma – the Estonian University of Life Sciences can choose to take the final Bachelor exam or elaborate Bachelor thesis. Bachelor thesis in the University of Helsinki is based on a review of scientific literature.

Academic Bachelor's study programme Sustainable Forestry was created on the basis of global development trends in strategic goals proposed by LLU. The goal of the programme is to prepare qualified, theoretically and practically educated forest discipline specialists for work in different public administration institutions and also companies and institutions operating in field of the forestry. Comparison of the main aspects with programmes corresponding the university industry in Italy and the Czech Republic, **in common:** study duration of programmes delivered in Italy and Czech Republic is 3 years, which corresponds to the newly created programme. The content of programmes in all three countries is similar even though the volumes of courses differ. **Differences:** Volume of programmes for the newly elaborated and Italian programme is equal (180 credits) whereas the volume in the Czech programme is slightly larger (191 ECTS). Unlike in Latvian study programme where approximately one half of courses, except for the Bachelor thesis,

are mandatory, in Italy the volume of mandatory courses is by one-third less of total volume of the programme, while more than a half of courses are from electives' section or specialisation courses. The course volume in Italian programme is twice as large as the newly created programme, while the volume of programme in the Czech Republic is 10 credits; remaining volume of the studies consists of mandatory and restricted elective courses.

Academic Master's study programme Agriculture was created with a goal to prepare the leading agricultural production specialists, public administration specialists and/or science specialists; the attainable results include knowledge on the latest trends in production and science. Large attention is paid to skills and competences related to information analysis as well as presentation and discussion skills.

The programme was compared to two programmes in the Helsinki University in Finland (HU, programme Agriculture Sciences) and Lappeenranta-Lahti University of Technology, programme Circular Economy) **In common:** volume of programme 120 credits, with a Master thesis in the end. **Differences:** both programmes in Finland are delivered in English, LUT programme focuses on sustainable economy and production, confers Master's Degree in Technologies rather than in Agriculture.

The goal of the **academic Master's study programme Forest Science** is to prepare highly qualified specialists for a scientific, pedagogic as well as professional and leading work who know well the scientific research and are competent to solve scientific and practical problems related to forest ecology and forest silviculture, forest work and machinery, forest economy and politics. The programme was compared to two programmes in Estonian University of Life Sciences, programme Forest Management, and programme Forest Sciences in the University of Helsinki. **In common:** programme's volume is 120 credits, study duration is 2 years, programmes are delivered in English, with Master thesis elaborated at the end. **Differences:** LLU has more courses even though the mandatory section contains rather similar courses; alumni in Estonia are conferred a Master Degree in Agriculture rather than Forestry.

Professional Master's study programme Food Hygiene. None of Latvian universities offer professional programme similar to "Food Hygiene" delivered by LLU. The programme prepares internationally competitive specialists, because the training is based on learning the laws and regulations governing food chains in EU, uniform and directly applicable to EU member states. The obtained Master's Degree provides long-lasting knowledge, useful when working in public food safety services, food industry and also as advisers in initial plants. Academic Master's programme Food Science offered by the Faculty of Food Technologies is close to the programme in question, however this one is academic study programme, and it offers different courses. Programme "Food Hygiene", in terms of its content and goals, is similar to the graduate programme "Food Safety" delivered by the Norwegian University of Veterinary Sciences. The necessary knowledge ensures undergraduate studies and additional studies in mandatory courses: Food Microbiology, Toxicology, Food and Environment Safety, Epidemiology and Risk Assessment, Methodology of Research, Food Technologies. Our programme contains courses Education and Psychology, Biostatistics in Food Hygiene, Genetically Modified Food, Quality Systems in Food Chain, Food Chain Control, Analysis of Food Shelf Life, Food Hygiene and Inspection, Foodborne Infections, Food Safety, Food Additives, Food Technologies, Food Toxicology and traineeship.

The doctoral programme Agriculture is unique, and it is aimed at giving doctoral students the highest level of theoretical knowledge and research work methods, principles of organisation of the scientific work, elaboration of the doctoral thesis and to obtain doctoral degree in line with the international requirements (Ph. D) in agriculture, forestry and fisheries or animal and dairy science. To prepare the new generation of scientists for solving scientific problems in agriculture. In order to

evaluate the content and competitiveness of the doctoral study programme, a comparison was made to two other post-graduate programmes: The University of Helsinki, post-graduate programme Sustainable Use of Renewable Natural Resources (AGROFREE) and Swedish University of Agricultural Sciences, programme Research School in Ecology. A degree to be conferred in LLU programme in the reporting period was Dr. agr., while after 2020 it was Ph.D, in comparable programmes in HU one can obtain different degrees depending on the specialisation (Doctor of Food Sciences, Doctor of Science (Agriculture or Forestry) or Doctor of Philosophy), while in students in SLU can obtain one of two degrees – Doctor of Agricultural Sciences or Doctor of Philosophy. Study duration in LLU differs from that in the compared programmes: It takes 3 years in LLU, whereas in both comparable universities: 4 years. Volume of theoretical courses in LLU post-graduate programme Agriculture is similar with the compared programmes: 42 ECTS (HU – 40 ECTS; SLU – 45 ECTS). Doctoral thesis is different: Doctoral thesis in LLU is written in Latvian, and main results have to be previously published; meanwhile in HU and SLU programmes the Doctoral thesis is based on ~4 publications in English. A doctoral student in both comparable universities has two supervisors, while in LLU it can also be the case, yet it is not mandatory. LLU also has different process of elaboration of the doctoral thesis.

Doctoral study programme Forestry was elaborated to be dynamic, and to give doctoral students knowledge on how to reflect and research changes in a forest ecosystem and forest industry, it embraces the most topical issues according to national and international socioeconomic situation and also international policies related to use of forest ecosystem services. In order to evaluate the content and competitiveness of the doctoral study programme, a comparison was made to two other post-graduate programmes: Doctoral study programme Environmental Technology offered by the University of Tartu, and programme Forestry delivered by the Estonian University of Life Sciences. A degree to be conferred in LLU programme in the reporting period was Dr.silv, but after 2020 it was Ph.D, in the comparable programmes in UT and EMU the degree to be conferred in entire period was Ph.D. Study duration in LLU is 3 years, whereas in both comparable universities: 4 years. Accordingly, total volume differs: it is 180 ECTS in LLU, and 240 ECTS in UT, EMU; volume of theoretical studies and number of courses (5, 6 and 7 respectively) is similar. Part of the programme under assessment has also different approach to Doctoral thesis; Doctoral thesis in LLU is written in Latvian, and the main results must be published in advance, whereas Doctoral thesis in UT and EMU programmes is based in at least 3 publications in the leading international scientific journals of the industry and must be created as a summary of thematically united scientific publications in English (with the outline in Estonian). Since 2019, a similar approach (possibility) and criteria was created (at least 3 publications in scientific journals where the author of doctoral thesis is the first or the main author) also in LLU, according to 25.09.2019. Scientific Council's resolution 19-20 and doctoral students of the Forest Science have taken this opportunity – theses in such format were defended both in 2019 and 2020. UT and EMU also have different process of doctoral thesis' elaboration with two or even more supervisors assigned, which is not, however, a regular practice in LLU MF.

1.2. Aims of the study direction and their compliance with the scope of activities of the higher education institution/ college, the strategic development directions, as well as the needs and the development trends of the society and the national economy.

According to LLU Development Strategy 2015 – 2022 (specified 14.10.2020, Senate decision No. 10-107), one of LLU **long-term goal** is excellence in research, which is integrated in the studies,

promoting technologies and innovations, as well as high quality studies when preparing internationally competitive specialists (<https://www.llu.lv/en/mission-and-vision> and https://www.llu.lv/sites/default/files/2020-12/StrategijaENG_8_12_2020.pdf).

The common goal of the study direction and programmes included in it, is to ensure acquisition of knowledge in successive good quality higher education in agriculture, forestry and fishery, and to learn knowledge and necessary skills in food hygiene, and this goal is closely related to LLU vision, and is aimed at achieving it – to become one of the leading universities of science and technologies in the Baltic Sea region specialising in sustainable use of natural resources and improvement of social life quality.

Suitability of programmes included in the study direction to the development needs of society and economy is determined by:

- Uniqueness of study programmes, which give knowledge, skills and competences relevant for the labour market.
- Succession of study process (undergraduate, graduate, postgraduate), which allows not only acquiring the necessary competences, but also mastering deeper knowledge, elaborating new technologies or innovations in a particular area.
- Widely offered possibilities for students (studies, research, materially technical provision, databases, international cooperation both in studies and traineeships, and in research etc.), because LLU has defined a direction of studies and science in context of areas included in the Latvian Smart Specialisation Strategy.
- Agriculture, Forestry, Fishery and Food Production is knowledge-intensive bioeconomy, which includes the use of natural resources and development of production with research-based technological and social innovations, aimed at improving the efficiency of these industries, more efficient use of resources and promoting competitiveness at regional and international scale.

The goal of study direction is related also to predicted labour market trends in the European Union. A report by the Ministry of Economics (EM) “Informative report on the mid-term and long-term labour market forecasts” (<https://www.em.gov.lv/lv/media/598/download>, Latvian only) states that in agriculture, forestry and fishery industries, just like on average in the EU, the number of employers is falling. In future a huge emphasis in these industries will be put on intensifying the efficiency, which correlated to the predicted constant demand for skills in science, technologies and engineering sciences (STEM). As a result of globalisation and technology development knowledge-centred economy will be an ongoing trend leading to an increased demand for highly qualified specialists, which are prepared in the programmes of all levels included in the study direction. Taking into account the high demand for substitution, there will be employment possibilities in all industries and professions. Development of bioeconomy will potentially create new workplaces particularly in the regions. Labour market development trends are especially linked to introduction of technologies, research, ecosystems management, sustainable management of resources.

1.3. SWOT analysis of the study direction with regard to the set aims by providing explanations on how the higher education institution/ college expects to eliminate/improve weaknesses, prevent threats, and avail themselves of the given opportunities, etc. The assessment of the plan for the development of the study direction for the next six years and the procedure of the elaboration thereof. In case there is no development plan elaborated or the aims/ objectives are set for a shorter period of time, information on the elaboration of the plan for the development of the study direction for the next assessment

period shall be provided.

Strengths and weaknesses, possibilities and risks of the study direction and programmes in it are evaluated based on the total economic, social and political situation in Latvia. Perspectives of study direction development is defined by labour market forecasts, nationally elaborated action policies in agriculture, forestry and related industries, and also development trends of socioeconomic processes, and assessment of study programmes included in the study direction (see Annex 5, SWOT analysis).

Once the internal and external factors have been assessed, study programme development will be driven in the context of strengths and possibilities. In order to maintain the strengths, one must continue research-and practice-based study process, which meets the demand for qualified, knowledgeable specialists (unique goal of undergraduate and graduate study programmes); demand for research in bioeconomy industries must be promoted, since it drives demand for the scientists (goal of postgraduate programme); current study programmes must be developed further, based on technologies and labour market trends; foreign student attraction to studies must be promoted in the new programmes. During the undergraduate studies there must be an opportunity to acquire deeper knowledge, competences or skills in issues concerning a particular area at the graduate programme's level thus improving the competitiveness. In order to involve the students in the research activities and promote cooperation with other institutions, one must continue managing and participating in national and international projects which would promote also attraction of foreign university lecturers and involving them in delivery of programmes of all levels. Participation in projects and student involvement in them would ensure wider publicity.

The weaknesses of the study direction are mainly related to the study direction, uneven preparedness of applicants, which holds them back from fully engaging in study process, irregular financial support for materially technical base, relatively low salary for the academic staff, insufficient funding for attracting foreign university lecturers; risks are related to decreasing number of students, which can be solved by attracting foreign students in the study programmes Agriculture and Forestry, by attracting also qualified academic staff, including foreign university lecturers. A closer cooperation with the employers from the industry and scholarships from different industry's companies would compensate for student's need to work which compromises the quality of studies.

Study direction development plan is closely linked to LLU development strategy and industry's action policy documents, and also development plants of programmes included in the direction. The main priorities of study direction development are related to (1) improvement of study content, environment and infrastructure, (2) promotion of elaborated and licensed two new academic Bachelor's study programmes in agriculture and forestry industries which will be delivered in English thus attracting foreign students, (3) more involvement of current study and research enterprises and other structural units in study process, (4) closer cooperation with partnering universities by involving foreign university lecturers in the study process.

The development plan of the study direction for each study program is attached in Annex 3.

1.4. The structure of the management of the study direction and the relevant study programmes, and the analysis and assessment of the efficiency thereof, including the assessment of the role of the director of the study direction and the heads of the study programmes, their responsibilities, and the cooperation with other heads of the study

programmes, as well as the assessment of the support by the administrative and technical staff of the higher education institution/ college provided within the study direction.

The study direction is included in the common structure of LLU; and Agriculture, Forest and Veterinary Medicine Faculties are responsible for the study programmes included in it (Annex 4, Management of study direction), whereas other LLU faculties (Faculty of Information and Technologies, Technical Faculty, Faculty of Environment and Construction Sciences, Faculty of Food Technology, Faculty of Economics and Public Development) are involved in delivery of study direction, LLU structural units, centres (Language Centre, Lifelong Education Centre, Sports Centre), research trial bases (Forest research station, Latvian plant protection centre, MPS "Vecauce", MPS "Pēterlauki"), scientific laboratories (Scientific Laboratory of Forest and Water Resources, Scientific Laboratory of Biotechnologies, Laboratory for Evaluating the Economic Features of Plant varieties) and scientific institutes (LLU Scientific Institute of Agriculture, Scientific Institute of Plant Protection Agrihorts, Institute of Agroresources and Economics, Institute of Horticulture).

The academic staff from the faculties of Agriculture, Forest and Veterinary Medicine are involved in delivery of study direction: deans, vice-deans, programme directors, institute directors and heads of departments. File-keeping officers of all faculties are involved as auxiliary staff and they supervise student files, manage office work, inform students and academic staff, manage document circulation and recording, and prepare diploma supplements.

Programme director is responsible for delivery of study programme according to LLU Senate Resolution No. 9-81 of 12.04.2017 "Regulation on programme directors" where rights and obligations of programme directors are laid down. A programme director is approved by LLU Senate on the basis of LLU Study Council's resolution. A candidate study programme is presented to the Faculty Council by the department/institute in charge of the programme. The programme director must organise elaboration of study programme; prepare information for annual report on self-assessment of study programme's direction and report on accreditation self-assessment; cooperate with faculty's dean, heads/directors of institutes / departments / centres, academic staff members and students in order to improve study programme; follow-up the assessment of academic staff involved in the study programme in LLU IS and evaluate it; analyse results of conducted surveys and initiate elimination of detected shortcomings; academically recognise courses, traineeships or their parts; inform students about the topicalities, activities and requirements in studies, cooperate with LLU Study and Communication and marketing centres about promoting the programme.

As mentioned before, directors of programmes prepare information for annual self-assessment reports of the study direction, which are confirmed in all the faculty councils included in the direction.

Programme directors, deans, vice-deans, heads of sub-directions, responsible representatives of departments and/or institutes are involved in a work of methodological commissions of the faculties (LLU Senate Resolution No. 6-17 of 09.04.2008 "Regulation of Methodological Commissions") thus creating a cooperation in evaluating and harmonising study programmes.

The study programmes were built, taking into account the needs of students in the study process and regularly evaluating and analysing the quality of study programme. Study work is organised by the faculties, departments/institutes included in the direction with a support from the administrative centres, and supervised by faculties' Councils, Study Centre, LLU Council and the Senate.

The study direction comprises 10 study programmes from three faculties, however they do not

have one Head of direction. The internal documents of LLU regulate preparation of study direction's reports and, if several faculties are included in a study direction, one of them is responsible for preparation of study direction's annual report (entities responsible for preparation of study direction are determined in Study Vice-rector's order No. 2.4-8/66 of 06.10.2020 "On the procedure of preparation of annual report on study directions and self-assessment reports").

Management efficiency is promoted by uniform organisation of studies in all study directions and programmes, uniform document samples and availability of information about the processes taking place and topicalities, regular meetings where the management, deans, supporting administrative structural units participate.

For chart of management structure refer and structural charts of faculties to the Annex 4.

1.5. Description and assessment of the requirements and the system for the admission of students by specifying, inter alia, the regulatory framework of the admission procedures and requirements. The assessment of the study period, professional experience, and the options for the students to have their previously acquired formal and non-formal education recognised within the study direction by providing specific examples of the application of these procedures.

LLU admission requirements have been elaborated and students are admitted according to external regulations – Law On Higher Education Institutions, Cabinet Regulation No. 846 of 10.10/2006 "Regulation on requirements, criteria and procedure for admission to the study programmes" and other legislation, and according to LLU Constitution, LLU Senate's resolutions "On admission requirements" (are adopted each year), resolutions of study Vice-rectors "On the procedure admission procedure in LLU" and "On mutual rights and obligations of applicant and LLU in admission process".

Admission regulations for all LLU programmes are approved in the Senate every October and then published on LLU website. For those interested, regulations in Latvian are available here <https://www.llu.lv/lv/uznemsana>, for studies in English: <https://www.llu.lv/en/degree-programmes>. The new students, graduate students and postgraduate students are admitted through a competition and in line with the competition criteria stated in the procedure for enrolment. Admission process is ensured by LLU Admission Commission and admission commissions of the faculties.

Admission regulation for students in Latvian as instruction language are available in annex to the main legislation documents (14_Admission_regulation_2021_2022.pdf)

In academic and professional Bachelor's study programmes admission requirements are – **general secondary education or vocational secondary education**. The new students are admitted via competition looking at their results in centralised examinations (CE) in Latvian, foreign language, (English, German, French or Russian) and mathematics; LF professional Bachelor's study programme "Agriculture" has another mandatory admission requirement – CE or final assessment in biology or natural sciences. CE assessment of foreign language can be substituted with international test assessment, in accordance with the Cabinet of Ministers Regulation No. 543 of 29.09.2015. If the secondary education was obtained between 2004 and 2008 inclusive, and CE in mathematics was not taken, this assessment can be substituted with the final assessment in mathematics. The following persons are admitted beyond competition and in part-time studies:

applicants who qualify for the mandatory requirements and rank in TOP 3 of international and LR Olympiads accepted by LR Ministry of Education and scientific research papers of LR pupils in the subjects and scientific disciplines/sections stated by the faculties.

The applicants can apply for a programme electronically (in portal latvija.lv) and uniform admission system where applicants' submissions from 12 Latvian universities (Latvia University of Life Sciences and Technologies, University of Latvia, Riga Technical University, Daugavpils University, Liepaja University, Vidzeme University of Applied Sciences, Rezekne Academy of Technologies, Ventspils University College, Bank College, BA School of Business and Finance, University of Applied Sciences, RISEBA University of Applied Sciences, ISMA) are processed. The single system has several advantages: (1) for universities – predict potential number of students who will sign the study agreement; (2) for applicants – apply for studies closer to their place of residence, follow-up their possibilities to study in the chosen programme, to operatively receive competition results. However, this single admission system has its shortcomings: (1) an applicant chooses several study programmes, therefore their applications often do not show the actual number of applicants; (2) some applicants do not clearly understand the principles of admission priorities.

Foreign student admission process in programmes “Sustainable Agriculture” and “Sustainable Forestry” complies with the regulation approved by LLU Senate “Admission requirements for studies in English” and are described on <https://www.llu.lv/en/how-to-apply>. According to the regulation the foreigners are admitted to LLU in compliance with Article 83 of the Law On Higher Educational Institutions and in LLU it is organised by the International Cooperation Centre (SSC) in collaboration with the Study Centre (SC) and Language Centre. Any foreigner is entitled to study in LLU in English and all of them have equal rights. In order to start studies, one needs a prior education supported by proper certified documents and recognised in Latvia, compliant with the programme's requirements and students must pass an entry examination – a test in biology and their English skills must be at least at B2 level.

Mandatory admission requirements in the **graduate programmes – Bachelor's degree or higher professional education giving access to the graduate programme**. The new graduate students are admitted subject to a competition, judging from the average weighted assessment in prior education. LLU alumni can apply for graduate studies electronically via LLU Information System, and alumni of other universities – by arriving at LLU.

Admission requirements for graduate studies included in the study direction:

Agriculture: Bachelor's degree, second level professional higher education or completed higher education until 1995. Persons with higher education in agriculture, forestry, a vet qualification or Bachelor Degree of Natural Sciences in Biology are admitted without entry examinations. If the higher education was obtained in other scientific disciplines, they must take an exam “Plant and Animal Biology”, information <https://www.llu.lv/lv/magistra-studijas/lauksaimnieciba>, Latvian only.

Forestry: Bachelor's Degree or second level professional higher education in forestry, material science, agriculture science, biology, environmental science, geography, computer sciences, management sciences, economy, transport and traffic industry's specialities (or similar higher education), information <https://www.llu.lv/en/master-study-programmes>.

Food Hygiene: Bachelor's degree or second level higher professional education in Veterinary Medicine, Food Science and Food Products Technology, Agriculture, Biology or Chemistry obtained in study programs lasting at least four years of full-time studies (160 CP), information <https://www.llu.lv/en/master-study-programmes>.

Doctoral programmes receive students on the basis of a regulation approved in the LLU Senate “LLU admission regulation for doctoral studies”. Information about admission process and

documents to be submitted can be found at <https://www.llu.lv/en/doctoral-study-programmes>.

Admission requirements for postgraduate studies included in the study direction:

Agriculture: Master's Degree in Agriculture or similar qualification as well as Master's Degree in similar fields. If the Master's Degree was obtained in other scientific discipline, the entrance examination must be taken once more. The entrance examination is organised by the programme director, the examination is accepted by the examination commission created by LLU Doctoral Study Regulation.

Forestry: Master's Degree in relevant or related scientific sub-discipline. If the Master's Degree was obtained in other industry, one must take entrance examination in forest ecology and forestry. The entrance examination is organised by programme director, the examination is accepted by the examination commission created according to LLU Doctoral Study Regulation.

In the programmes of study direction potential students can start studying also at later study phases if knowledge, skills and competences have been built in formal or informal education. **Starting studies at later phases** is defined by the Law On Higher Education Institutions and Cabinet Regulations No. 932 of 16.11.2004 "Procedure for starting the studies at later phases", LLU has approved regulations and procedures for starting studies at later phases and recognition of knowledge, skills and competences acquired outside formal education or obtained in professional experience. Information in LLU is available on <https://www.llu.lv/lv/pariesana-no-citas-augstskolas> and <https://www.llu.lv/lv/atjaunosanas-studijam> (Latvian only).

Starting studies at later phases in the programmes under study direction once a student has graduated from other universities or if the programme cannot be acquired partially due to uniqueness of study programmes. It is possible when re-registering for studies, and it is possible to align / recognise previously acquired study courses. During the reporting period, studies at later phases in the programmes were resumed by 221 students, and the largest number of them were in the professional Bachelor's study programme Agriculture and Forest Engineer.

There were several reasons for starting studies at later phases: (1) when re-registering for studies after academic leave of absence (exmatriculation); (2) when changing LLU study programmes (certain courses are aligned) or (3) when starting the studies after graduation from other universities or partial acquisition of programme in other university (certain courses are aligned).

For example, in professional Bachelor's study programme "Agriculture", in the reporting period, studies at later phases were started by 56 full-time students and part-time students, 2 students had their courses from other universities aligned/recognised, 39 students started studies and their courses from other university graduated were aligned/recognised, 15 students came to study from other LLU faculties and their courses were accordingly aligned/recognised.

Regulation on **recognition of learning outcomes** acquired in prior learning takes place according to:

- external regulations:
- Law On Higher Education Institution:
- 01.2012. Cabinet Regulation No. 36 "Recognition of learning outcomes achieved in prior learning or in professional experience" (inapplicable since 17.08.2018),
- 08.2018. Cabinet Regulation No. 505 "Regulation on recognition of competences acquired outside the formal learning or obtained in professional experience and learning outcomes achieved in prior learning";
- internal regulations:
- LLU Senate resolution No. 7-183 of 09.05.2012 "Regulation on recognition of learning

outcomes acquired in prior learning or prior learning or professional experience”;

- LLU Senate resolution No. 9-188 of 13.02.2019 “Regulation on recognition of knowledge, skills and competences acquired outside the formal learning or obtained in professional experience”). Information is available on <https://www.mc.llu.lv/pakalpojumi/pieredzes-atzisana> (Latvian only).

This opportunity in the study direction was used by 3 students (1 from LF in professional Bachelor’s study programme Agriculture in academic year of 2014/2015, and 3 from MF professional Bachelor’s study programme Forest Engineer in academic year of 2019/2020) by recognising the professional practice.

LLU provides a possibility to acquire courses in a capacity of a listener (<https://www.mc.llu.lv/pakalpojumi/atverta-universitate-klausitaji>, Latvian only). A listener’s status allows participating in the study process, taking tests and exams, using resources (for example, library, e-studies platform etc.) to improve qualification. A listener may supplement their knowledge and master certain courses both in an industry related to their speciality, to study gradually (at a pace and volume chosen by the student) and accumulate credits, which are recognised at later study phases in future studies at LLU or other university. A listener receives a certificate on acquired courses. This opportunity can be taken also by former students who have discontinued studies. If discontinuation of studies has resulted in the change of a programme, it is necessary to acquire the course as a listener. More than 700 listeners have acquired courses in this study direction in the reporting period.

1.6. Assessment of the methods and procedures for the evaluation of students’ achievements, as well as the principles of their selection and the analysis of the compliance of the evaluation methods and procedures with the aims of the study programmes and the needs of the students.

The basic principles of assessment of student knowledge are defined by the Cabinet Regulation No. 240 of 16.05.2016 “Regulation on national academic education standard” and LLU internal normative documents (Study Regulation).

The basic principles of assessment are determined in LLU Study Regulation where assessment criteria, conditions and binding procedures are described and available in Latvian here <https://www.llu.lv/lv/studiju-un-reglamentejosie-dokumenti>, in English https://www.llu.lv/en/study-guide-documents_

They are based on the expected learning outcomes in each study programme and are equal regardless of study type and form.

Referring to external and internal regulating documents, student progress is assessed according to the following basic principles:

- openness: there is a defined set of requirements according to the goals of each study programme and proposed goals. The quality of knowledge is assessed both qualitatively (with a grade in 10-point system, some courses – as “pass/fail”) and quantitatively (credits which point at the number of work in lessons in a study course);
- compulsory assessment principle: a student must pass all tests/exams of the programme;
- assessment reviewing possibility: LLU defines a procedure for reviewing the obtained assessment;

- diversity of tests: different types of tests, which are reflected in course description, are used to evaluate programme acquisition.

Course programmes define knowledge, skills and competences and their assessment, requirements for obtaining credits and criteria for obtaining credits; they also contain organisation of independent works and tasks. University lecturers introduce the students to goals, tasks, tests, independent work tasks and procedure of performance and assessment criteria at the beginning of study course. Information is placed also in e-studies platform of LLU.

Types of assessment methods determined in the course are chosen based on the goals of particular study programme, proposed tasks and expected results, as well as knowledge defined in the profession standard at the level of understanding and application (for undergraduate studies). An academic staff member can choose test method taking into account the specifics of study course, student preparedness, previously acquired courses. Types of tests are discussed with colleagues, basing also on internal regulatory documents of LLU (academic staff of institute/department, programme directors, methodological commissions are involved).

Analysis of undergraduate and graduate students' progress is evaluated twice during the academic year once the semester is over. If a student encounters difficulty with executing course requirements (including due to illness and other justifying reasons), he or she can attend consultations at university lecturers and customise studies according to an individual plan as agreed with the academic staff member. The individual plan is harmonised with programme director and dean. Study Regulation contains information on what a student should do in case of academic debts.

LLU has elaborated assessment principles for **student theses**, following LLU Senate resolution "Regulation on final examinations of studies" and subordinated orders of the Rector and study Vice-rector as well as methodological instructions elaborated by the faculty for elaboration and defense of theses. Assessment procedure for evaluation of theses is described in course descriptions of theses (undergraduate or graduate programmes). The theses are elaborated in several phases and presented publicly (bibliography review and thesis) in a sitting of relevant academic staff of institution/department where a decision is made on the readiness of thesis, scheduling a repeated defense if needed. Evaluation of theses comprises the assessment given by thesis' reviewer or reviewers (for Master theses) and the National Examination Commission or Master Examination Commission.

Methodological instructions elaborated by LF "Elaboration and execution of thesis", which are reviewed on a regular basis in faculty's Methodological Commission and approved in the Council, available at <http://www.lf.llu.lv/lv/studiju-un-reglamentejosie-dokumenti>, in Latvian. Methodological instructions elaborated by MF for theses "Structure and execution of thesis" are approved in the Council, methodological instructions for elaboration of course papers and project elaboration have been elaborated and approved in department sittings, are available at <http://mf.llu.lv/lv/studiju-dokumenti-un-veidlapas>, in Latvian. Methodological Instructions elaborated and approved in VMF Food and Environment Hygiene (PVHI) define requirements laid down of the Master thesis and procedure of execution.

Traineeship evaluation is based on "LLU Traineeship Regulation" and subordinated orders approved in LLU Senate and regulations elaborated by the faculty where student performance is evaluated according to the traineeship goal and tasks. Traineeship assessment is formed in several phases (depending on traineeship type (study, professional, research) and volume) - traineeship summary, traineeship supervisor's feedback, public presentation of the summary. Assessment of professional traineeship is determined by the traineeship defense commission (created with a dean's order), in line with the requirements described in the traineeship programme to obtain

credits and assessment criteria.

Procedure for **assessing the doctoral thesis** and criteria and procedure for granting a scientific degree (doctoral) are defined by LR Cabinet of Ministers Regulation No. 1001 "Procedure and criteria for granting a scientific doctoral degree". A student has completed good quality doctoral studies with successful examinations and tests stated in the doctoral study plan, submission of doctoral thesis for defense of the doctoral degree in the Doctoral Council of the relevant industry, public defense of the doctoral thesis and acquisition of doctor's degree. Procedure and binding documents for obtaining a doctoral degree <https://www.llu.lv/lv/promocijas-kartiba>, in Latvian.

Principles, criteria and procedure for evaluation of different levels of students' achievements allow attaining programmes' goals and put in place student-centred assessment.

1.7. Description and assessment of the academic integrity principles, the mechanisms for the compliance with these principles, and the way in which the stakeholders are informed. Specify the plagiarism detection tools used by providing examples of the use of these tools and mechanisms.

Academic integrity, which involves various parties, implies performing academic work at the highest standards of professionalism and accuracy, objectivity and truthfulness, moral and ethical principles, integrity, including the prevention of plagiarism, sincere reporting and accuracy in academic research papers, communications and publicity events, which form the image of the academic environment.

The academic integrity of LLU **is aimed** at:

- practising a high academic and scientific culture;
- promoting public confidence in the quality of education and the results of scientific research;
- preventing and avoiding violations of the principles of academic integrity;
- imposing liability for unfair and unauthorized behaviour.

Students and the academic, general, scientific and administrative personnel of LLU are equally responsible for complying with the principles of academic integrity and for the consequences of violating academic integrity. Students are informed about academic integrity principles when starting their studies and during various courses. Students are regularly informed about academic integrity principles in programme, vice-dean, dean and student sittings and meetings. The academic staff is informed about these principles in joint meetings of institutes/departments/councils.

LLU has developed and introduced certain procedures for the examination of plagiarism in graduate theses and actions if it is found:

- LLU rector regulation "Procedure for Submitting Electronic Copies of Graduate Theses and their Examination in the Plagiarism Control System";
- LLU rector regulation Violations of Academic Integrity in Graduate Theses and Doctoral Dissertations.

LLU entered into agreement on a single inter-university computerised plagiarism control system (henceforth the System) in 2014 and started cross-checking all theses for plagiarism both in undergraduate and graduate studies, starting with the academic year of 2017/2018, LLU determined that also doctoral theses must be cross-checked for plagiarism. The procedure states

that if the System detects 10% of overlapping of the final paper's text with other paper, LLU reviews the thesis in the faculty's Methodological Commission / Doctoral Council of the industry and decides if it is a plagiarism, and before doing that, it receives personal explanation from the author and supervisor of the thesis.

1,101 theses (478 LF + 42 VMF + 581 MF) have been cross-checked in the study direction Agriculture, Forestry, Fishery, Veterinary Medicine and Food Hygiene between 2014 and 2019. Of them 4 theses were found to be plagiarism (1 LF in academic year of 2017/2018, by part-time student, MF 1 Master thesis in academic year of 2016/2017 and 1 Master thesis and 1 Bachelor thesis of part-time student in academic year of 2018/2019) leading to exmatriculated of students due to unfair studies.

1.8. Specify the websites (e.g. the homepage) on which the information on the study direction and the relevant study programmes is published (in all languages in which the study programmes are implemented) by indicating the persons responsible for the compliance of the information available on the website with the information published in the official registers.

Information on the fields of study and the programmes contained therein is published on the website of LLU at: **www.llu.lv**, including on current developments in the relevant programmes, as well as basic information about each programme. *Detailed information (descriptions of the programmes) is available in the section Studijas / Studiju programmas -> <https://www.llu.lv/lv/studiju-programmas> and in the section Nāc studēt / Ko studēt? Palīgs studiju programmu izvēlē -> <https://www.llu.lv/lv/studiju-programmas> (in Latvian).*

Information **in English** on the programmes is available on the LLU website: Studies / Degree Studies / Degree Programmes -> <https://www.llu.lv/en/degree-programmes>.

The descriptions of all the programmes are available on the website of faculty:

- Faculty of Agriculture: <http://www.lf.llu.lv/lv/studijas> selection *Studijas / Studiju iespējas* - > <http://www.lf.llu.lv/lv/studiju-iespejas>, in Latvian;
- Forest faculty: <http://www.mf.llu.lv/lv/studijas> (in Latvian) selection *Studijas / Studiju iespējas* - > <http://www.mf.llu.lv/lv/studiju-iespejas>, in Latvian;
- Faculty of Veterinary Medicine: <http://www.vmf.llu.lv/lv/studijas> (in Latvian) selection *Studijas / Studiju iespējas* - > <http://www.vmf.llu.lv/lv/studiju-iespejas>, in Latvian.

Information about the programmes is also available in electronic informative materials (booklets), incl. information on each particular programme and graduate feedback:

- booklet for bachelor programmes at: <https://www.llu.lv/sites/default/files/2019-02/LLU-pamatstudiju-buklets-2019-WEB.pdf>;
- booklet for master programmes at: https://www.llu.lv/sites/default/files/2019-03/LLU-Magistra-studijas-2019-web_0.pdf;
- information on doctoral programmes at: <https://www.llu.lv/en/doctoral-study-programmes> and the topics of dissertations defended and success stories at: <https://www.llu.lv/lv/zinatnu-doktoru-godinasana> (in Latvian). Regulation of doctoral study is available here: https://www.llu.lv/sites/default/files/2018-03/Regulation%20of%20doctoral%20studies_0.pdf

The **organisational units responsible** for the consistency of the information available on the LLU website with the information available in the official registers are as follows:

- Centre for Studies – 1st level professional higher education programmes, bachelor and master programmes,
- Centre for Studies – doctoral programmes,
- International Cooperation Centre on programmes delivered in English.

Information on the LLU website is prepared in cooperation with the director of each programme.

Information on LLU programmes is also available on the portal **www.prakse.lv**: <https://www.prakse.lv/edu/profile/84/latvijas-lauksaimniecibas-universitate> (in Latvian) the responsible person is a project manager of the Lifelong Education Centre.

Information on LLU programmes is also available in the **Database for National Education Opportunities** at: www.niid.lv detail in the: http://niid.lv/niid_search?qy=Latvijas%20Lauksaimniec%C4%ABbas%20universite&level_1=7

The LLU website provides information on academic mobility eligibility criteria and procedures in accordance with the Erasmus+ University Harta and the programme guidelines:

- <https://www.llu.lv/lv/starptautiska-mobilitate> - in Latvian
- <https://www.llu.lv/en/exchange-studies> - in English

LLU subscribes the following e-marketing websites: <https://www.masterstudies.com/universities/Latvia/LLU/> and <https://www.educations.com/search/jelgava>

Foreign students

The LLU website provides comprehensive and detailed information for potential and current full-time students from abroad on:

- LLU programmes delivered in English at: <http://www.llu.lv/en/degree-programmes>, and a description of each programme gives details even about the study plan, e.g. at: https://www.llu.lv/sites/default/files/2016-10/MBA_LLU%281%29.pdf ;
- admission requirements at: <http://www.llu.lv/en/how-to-apply> ;
- immigration procedures at: <http://www.llu.lv/index.php/en/immigration> ;
- conditions for studies and living at: <http://www.llu.lv/sites/default/files/2018-11/LLU-Celvedis-EN-2018-17.10.pdf>; <http://www.llu.lv/index.php/en/before-arrival>; <http://www.llu.lv/index.php/en/about-university-0> ;
- foreign student testimonials at: <http://www.llu.lv/en/student-testimonials-7> .

Responsibility for the consistency of the content available on the websites or changes therein with official information lies with the programme director or the external relations coordinator of the Faculty, while the external communication coordinators of the LLU International Cooperation Centre (ICC) are responsible for placing the information on the websites.

The LLU International Cooperation Centre has produced and published informative booklets: the Erasmus+ Mobility Information Handbook and Degree Studies, leaflets and other materials that are used for advertising the programmes and international student exchange at marketing event.

II - Description of the Study Direction (2. Efficiency of the Internal Quality Assurance System)

2.1. Assessment of the efficiency of the internal quality assurance system within the study direction by specifying the measures undertaken to achieve the aims and outcomes of the study programmes and to ensure continuous improvement, development, and efficient performance of the study direction and the relevant study programmes.

Internal quality assurance system is an ongoing process, goal of which is constant improvement and development of study direction and programmes included in it. It is evidenced by internationally recognised certificate “Investor in Excellence” obtained by LLU which has been obtained for the second time and now activities of LLU according to this certificate have been accredited until 2022 (<https://www.llu.lv/lv/sertifikats-investors-in-excellence>, Latvian only).

Internal quality assurance system is based on several phases:

- planning – determines goals, plan staff, financial, temporal and other resources – desirable results of the activity are determined in LLU Development strategy, LF, VMF, MF work plan to implement LLU Development Strategy 2015-2022 (specified 14.10.2020, LLU Senate decision No. 10-107), LLU admission limits and forecasts;
- doing – delivers study and research process, faculty’s activities;
- checking – controls and implements supervision measures (for example, analysis of strategy delivery results);
- acting – improves processes and activities, initiates changes in internal regulatory documents.

In general, LLU organises and guides study work according to standards and guidelines to ensure quality in the European Higher Education Area. Taking into account these guidelines, the necessary internal normative documents for organising the studies have been created. Activities of LLU and faculties are supervised through steps integrated in daily work and activities, such as harmonisation, approval, work quality assessment, division of obligations and responsibility etc., at the same time targeted control measures are in place and implemented occasionally throughout the year.

Indicators **characterising study quality**:

- number of students admitted – Study Centre sends information to the dean and programme directors once a year to evaluate data and collect statistics.
- number of students in the programme – Study Centre sends information to the dean and programme directors once a month to evaluate and analyse data, take steps where necessary;
- filling in budgetary places – Study Centre sends data to LLU management, deans, vice-deans once a month.

Indicators **characterising qualification and work quality of academic staff** are:

- student assessment at the end of each semester. The survey is electronic and available on LLU IS. The survey results are available to the programme directors, vice-dean, heads of structural units and each academic staff member individually (assessment of a course delivered in relevant semester). Survey results and commentaries provided in it allow a university lecturer to improve their work, show to the programme director the whole picture

and recommendations for improvement of courses and general quality of the programme. Heads of the structural units and management use information obtained from the surveys for improving the study quality at university's scale. Survey results is one of criteria in LLU academic staff motivation system.

- academic staff qualification is ensured by LLU regulation on academic positions, which indicates at compliance of person's academic and professional qualification with study and research work (<https://www.llu.lv/lv/nolikumi>, Latvian only);
- In order to promote constant professional development of academic staff in the university didactics, the professional development programme for higher education teachers "Innovations in university teaching" was created.

As of academic year of 2018/2019, LLU has introduced class visitation (LLU Study Council resolution "Procedure for class visiting in LLU") to exchange experience or control the quality of lectures. Programme director, head of structural unit or other LLU academic staff members can visit the classes. Academic staff member is informed about visiting results and if there are particular proposals for improvement of classes, the academic staff member informs about the scheduled steps already taken or planned.

In order to **supervise study environment quality**, self-assessment reports of the study programme are prepared on a yearly basis and it contains information about changes in study plans and courses, creation of new courses, study materials and information resources, cooperation with stakeholders and changes in infrastructure etc.

Important aspect of study quality is availability of study materials, text-books and aids, therefore collection of LLU Fundamental Library is constantly replenished with literature in national language and foreign languages (mainly in English) at the recommendation of academic staff members. University lecturers also prepare study materials, write text-books and monographs which are used for the studies.

Faculty's management and other structural units of LLU constantly follow-up compliance of classrooms and materially technical provision with the needs of good quality study process.

According to results of quality supervision measures taken, study quality is reviewed and improvement measures are taken.

2.2. Analysis and assessment of the system and the procedures for the development and review of the study programmes by providing specific examples of the procedures for the development of new study programmes within the study direction (including the approval of study programmes), the review of the study programmes, the aims, and regularity, as well as the stakeholders and their responsibilities. Description of the mechanism for obtaining and providing a feedback, including with regard to the work with the students, graduates, and employers.

Elaboration of new programmes in LLU takes place according to a regulation "Regulation for elaboration, approval of and amendments to the study programmes in LLU" approved by the Senate (https://www.llu.lv/sites/default/files/2019-03/Studiju_programmu_izstradasanas_noteikumi_2019.pdf, Latvian only, available here: <https://www.llu.lv/lv/ar-studijam-saistitie-dokumenti>, Latvian only). The Regulation stipulates that before a study programme is approved in the Senate it is discussed and analysed in faculty's

Methodological Commission, Council and LLU Study Council.

The development of a new study program is mainly based on market research in higher education (offered study programs) and analysis of demand (including talking with ERASMUS+ incoming students). The development of the study program begins with the idea of a specific level study program, which is reported to the faculty council (Faculty of Agriculture and Forest Faculty). After a positive decision of the council, the potential director of the study program led the development of the content of the program. External experts, industry representatives, students and graduates are involved in the development. The content of the study program was reviewed by the methodological commission of the faculty and an independent expertise of the program was organized. After that, the program was submitted for approval to the Senate of the LLU. Following the procedure specified in these regulations, two new academic bachelor study programs "Sustainable Agriculture" and "Sustainable Forestry" have been developed.

Existing programmes are reviewed every academic year and it results in the annual summary (report) of study direction. Reports are available on LLU website <https://www.llu.lv/lv/studiju-un-reglamentejosie-dokumenti> (in Latvian). The summaries are analysed in faculty's Council, Study Centre, Study Council and approved in the Senate.

Academic staff members, students, alumni, employers, industry's NGOs, industry representatives and other stakeholders are involved in improving of programmes of the study direction, taking into account also amendments to the laws and regulations.

student involvement in evaluation of programmes has many forms. The process is described also in Part 3 regarding each programme. Ways of involvement:

- through evaluation given to each course from student's perspective (at the end of each semester);
- surveys of programme directors in the study process, the obtained results are discussed in a sitting of methodological commissions, students are informed about execution possibilities and plan in course and group seniors' meetings or in individual meetings;
- regular meetings of programme and vice-dean with students thus ensuring information exchange.

Alumni are engaged in evaluation of study process and programme via alumni surveys which measure the satisfaction with study organisation, administration quality, work of academic staff members and mutual communication, study resources. The alumni obtain a feedback by participating in the work of the National Examination Commission as industry representatives or traineeship supervisors, when meeting with the faculty representatives.

Programme director collects survey results and informs about them in the Methodological Studies sitting, Council sitting when discussing annual self-assessment reports, reconsidering and planning particular steps to improve study process and programme quality.

In a context of results achieved, the programme is evaluated also from theses and public defense thereof, because industry's representatives are involved in elaboration of theses (they are elaborated on a basis of a company / institute / farm) and work of the National Examinations Commission (NEC) and Master Examination Commission (MEC). Judging from the work of NEC and MEC, the results are discussed and a report on the commission work is prepared (according to the Senate Resolution No. 8-65 of 09.04.2014 "Regulation on the Final Study Examinations"). Chairperson of the Commission and/or a deputy thereof submits to the faculty's council a written report on the results of Commission's work and recommendations for improvement of the programme. Faculty's Council decides on improvement measures. Assessment of theses also reflect the level of attainment of learning outcomes.

Programme directors report on the results of theses in the Council sitting where student representatives participate, too. The report is read also in the formal part of the day when diplomas are handed out, thus providing a feedback.

LLU Regulation on Traineeships state that a student must submit professional traineeship report together with a recommendation from a supervisor in the traineeship provider. This feedback is evaluated also for the purposes of attainable outcomes in programme development. The goal of a recommendation from the supervisor in the traineeship provider is to find out an opinion of employer on professional preparedness of the student for the labour market and assessment of competences acquired, including evaluation on their teamwork skills and independent decision-making. Study traineeships are supervised by academic staff members, and in undergraduate programme Forest Engineer the study traineeship Motorised Tools in Forestry (MeŽZP013) take place in production companies where the traineeship provider also gives a feedback on student competence once the traineeship is completed. The feedback is summarised by traineeship coordinator or programme director and result summary is reported in structural units' general meetings and/or Council sitting.

All study programmes were evaluated in detail within the framework of LLU project "Improvement of administration of Latvia University of Life Sciences and Technologies" between 2018 and 2021. Foreign experts and representatives from relevant industry (employees) participated in evaluation of programmes. Over the course of programme evaluation the industry's representatives and experts meet with programme directors, faculty's management, discussed programme content, substantiation of creation, delivery process, compliance of the programme with market requirements. Based on expert recommendations, plans to improve study programmes were elaborated and delivered and/or planned to be delivered.

Programme director and/or vice-dean follows-up student progress which indicates at expected learning outcomes. Regular meetings with the course students and focus groups, failing students and academic staff members delivering problematic courses are organised to discuss causes and find solutions.

The goal of study programmes and expected outcomes are discussed along with the approval of a new LLU action strategy planning period. The goals of programmes included in the study direction are subordinated to the goal of study direction, which is closely related to LLU strategy.

2.3. Description of the procedures and/or systems according to which the students are expected to submit complaints and proposals (except for the surveys to be conducted among the students). Specify whether and how the students have access to the information on the possibilities to submit complaints and proposals and how the outcomes of the examination of the complaints and proposals and the improvements of the study direction and the relevant study programmes are communicated by providing the respective examples.

Students can and they are entitled to submit suggestions and complaints about study process and related matters during the studies. The students may submit the suggestions to:

- the faculty, in a written or verbal form, - to the curator, programme director, vice-dean or dean;
- in a written or verbal form at LLU management level - to the Study Centre, to study vice-

rector, Study Council and Senate and when confirming different normative documents.

- anonymously through Whistleblowing option in LLU <https://www.llu.lv/lv/trauksmes-celsana>, in Latvian.

LLU Study Regulation, which is available for all students in Mans LLU, there is a procedure of appeal submission and review.

If a student has submitted a written complaint, he or she will receive a written reply once the complaint is reviewed if the complaint has been examined in absence of the student.

Students can submit their complaint also with LLU Arbitrage which operates according to its Rules.

Students of the study direction have filed several complaints about organisation and course of certain courses and requirements put forth by the academic staff members. In these cases, a meeting with participation of students, academic staff member in question, programme director, faculty's management was organised and a solution was found through negotiations. Particular dissatisfaction of students and situation descriptions were taken into account to improve study quality in future.

2.4. Provide information on the mechanism for collecting the statistical data, as developed by the higher education institution/ college. Specify the type of the data to be collected, the collection frequency, and the way the information is used to improve the study direction.

LLU centrally collects statistical data in various perspectives and with various regularity, which is dictated by external or internal stakeholders.

Once a month

1. Number of students across the programmes, study types and forms, study directions and faculties – gathered statistics are sent to LLU management and deans of the faculties. Statistical data are used to follow-up the dynamics of student numbers in LLU.
2. Filling of state-funded study places – data are collected across study programmes to follow-up if state-funded study places are filled. These statistical data are used to forecast the number of students admitted in state-funded study places and student rotation each semester (competition for state-funded study places) – the collected statistics are sent to LLU management and faculty's deans, and to vice-deans of the faculties as applicable;

Once a study year

1. Number of alumni across the study programmes, study directions and faculties, types of funding – data are used for preparing various reports (for example LLU annual report <https://www.llu.lv/lv/llu-pamatdokumenti>);
2. Admission results – admission results from various perspectives. Admission results are used when planning admission limit and forecasts for the next year.
3. Statistical data collection in LLU "University-1" for the Central Statistics Bureau (CSB) is created based on the forms dictated by CSB. The collected data are sent also to the Ministry of Education and Science and they are available for all stakeholders (<https://izm.gov.lv/lv/publikacijas-un-statistika/statistika-par-izglitibu/statistika-par-augstako-izglitibu>, in Latvian). Data are used also for preparing various reports (for example LLU annual report).

Once a year:

1. Statistical data collection across study directions – the collection applies to previous academic year (number of students by study programmes, types and form, alumni, dropouts and reasons of dropping out, statistics of foreign students). These data collections are sent to all programme directors and data are used for preparing of annual study direction reports for the purpose of evaluating thereof (available at <https://www.llu.lv/lv/studiju-un-reglamentejosie-dokumenti>, in Latvian).
2. Filling the state-funded study places within a year – data are used for preparing contract performance reports signed among LLU, Ministry of Agriculture and Ministry of Education and Science.
3. LLU Development Strategy 2015-2020, summary of performance results of Education Programmes – data are used for annual reports on performance of LLU Development Strategy and cascading of performance results for the next year. Strategy performance reports by faculties are made in on-site sittings.
4. Student and academic staff mobility indicators. They are collected by LLU International Cooperation Centre and data are used for preparing various reports, creating lists of most active students and academic staff members, analysis of partnering universities most attractive for students.

Data are collected at the determined frequency at faculty level and analysed against the attainable outcomes defined in LLU Strategy in education and research.

The following data are still analysed at the level of faculties:

- evaluation of academic staff work quality by students (each semester),
- alumni survey results (annually),
- information about student employment (existing or potential workplaces, once a year before finishing studies),
- quantitative and qualitative indicators of the scientific activity of academic staff members, including student engagement in the scientific work (annually),
- materially technical provision (at least annually).

Based on certain data, faculties may define development directions of academic staff, to plan and improve organisation of study process, plan materially technical and informative materials, evaluate engagement of academic staff members and students in the scientific work. To look for possibilities to introduce various activities in study process where necessary.

2.5. Description and assessment of the integration of the standards set forth in Part 1 of the ESG. Specify which of the standards are considered a challenge and which require special attention.

LLU Development Strategy, implementation of quality management, personnel development, administration improvement plan, infrastructure development plan are the main lines of activity in LLU strategic priorities.

It is really challenging to provide material and technical resources in context of current funding, because acquisition of study programmes of the direction calls for various equipment, devices, apparatus which are changing rapidly and require extensive financial resources to maintain them.

as digital solutions enter daily and professional life and new technologies emerge, the youth changes their attitude towards information channels and studies, the university must increasingly seek new approaches to offering a content satisfying students' interests and possibilities to learn and also study. LLU goes hand in hand with changes in study methods applied to study process, and increasingly more innovative teaching methods, for example e-studies platform with all the features it offers, various digital tools, simulation games and software. Students are more and more involved in scientific and creative activities (scientific projects, classes where new things are learned etc.).

Integration of standards from ESG part 1 to ensure internal quality of study direction:

ESG 1.1. Quality assurance policy – quality assurance policy elaborated in LLU envisages responsibility of parties involved in delivery of quality assurance. Students, employees, research institutes (for example, in elaboration of theses, reviewers, cooperation partners), employers, industry representatives (for example, participation in traineeship defense, in defense commissions), other education institutions (for example, cooperation in the use of resources). LLU quality assurance system description and implementation plan can be found on LLU website <https://www.llu.lv/en/study-guide-documents>. Equipped laboratories are available to perform good quality practical laboratory works and elaboration of theses, providing necessary reactants and other agents.

ESG 1.2. Programme elaboration and approval – LLU has elaborated a regulation on elaboration, internal supervision and occasional review of programmes (see Sec. 2.2.2).

ESG 1.3. Student-centred learning, teaching and assessment – LLU implements student-centred learning (Sect. 2.16, 2.21, 2.2.2 and 2.2.3).

Attention must be paid to students' ability to study independently and responsibly, putting all efforts towards it.

ESG 1.4. Student admission, study progress, recognition of qualification and certification – admission to LLU takes place in compliance with the Admission Regulations approved by the Senate for relevant study level. Admission regulations are approved annually. A system where prior education and learning outcomes in informal education are recognised exists and is applicable (see Sec. 2.1.5). LLU is an information system where information about each student is collected and where one can follow-up the study progress of each student. Students can follow-up their progress, plan of studies acquired, financial information.

ESG 1.5. Academic staff – university lecturers with suitable academic qualification, competence and experience in the industry are engaged in the study process. Professional development both in teaching and research areas is ensured for the academic staff, Academic staff members can participate in the scientific work, industry's organisations, ministry's work groups (see Sec. 2.3.4, 2.3.5, 2.3.6).

One must pay attention to burnout of academic staff members because majority of them are involved also in the research and administrative work. Attraction of new academic staff members, considering that delivery of specialised courses does not make a full workload, is still a huge challenge.

ESG 1.6. Teaching resources and student support – LLU resource provision meets the needs of study delivery by integrating industry-relevant content and modern solutions for acquisition thereof. Academic staff members elaborate suitable study materials, practical classes, methodological materials (available both in printed and electronic form), write textbooks and monographs. Extensive range of printed periodicals is available in LLU Fundamental Library and

information and methodological offices of faculties, there are subscriptions of databases relevant for the study direction (see Sec, 2.3.2). Students are informed that other libraries can be used for study purposes. Study materials and auxiliary materials are placed in e-studies platform. Programme directors, vice-deans and also deans regularly communicate with students about study process, programme content, organisational issues. Students can attend consultations with academic staff. They communicate and consult both on-site and off-site (calls, e-mail, e-studies). Informative support is provided also by employees of the dean's office.

One must pay attention to funds necessary for maintaining the infrastructure (they are included in faculty estimate yet sometimes there is a shortage), introduction or development of newest technological solutions, must promote development of students in work with databases and scientific literature.

ESG 1.7. Information management - Information about students is placed in LLU Information System (IS). Information availability is regulated. Students can follow-up study progress in their user accounts of LLU IS (learning progress, acquired courses), personal data, finances, scholarships, course descriptions and similar information, they evaluate courses and academic staff members. Lists of classes are published in LLU portal. Information about internal regulatory acts, topical internal information is available in MansLLU (LLU intranet). E-studies platform contains all the necessary study information - study materials, independent and practical assignments, control questions, auxiliary materials etc. Different surveys are conducted on a regular basis to obtain information about student satisfaction, proposals, to get recommendations from alumni, employers. This information is used when drawing up self-assessment of the programme and study direction. The self-assessment report is published both on LLU website and websites of the faculties. Progress of studies, performance score, student survey results, available teaching aids and student support is regularly discussed in internal collegial institutions and they are taken into consideration when planning further steps to improve study quality.

More attention is paid to student and academic staff engagement in general meetings, discussions, adopting consequent solutions.

ESG 1.8. Public awareness - University website www.llu.lv/en regularly publishes impartial and relevant information about study programmes it offers, research and cooperation projects, activities and events in LLU. Public awareness is achieved through other communication tools, including social networks and mass media, because information about activities of the university is useful both for existing and potential students, and also alumni, employers and other stakeholders. LLU representatives actively engage in the work of organisations, work groups of ministries, commissions, elaboration of laws and regulations, various initiatives, cooperation projects with industry's companies, organising various seminars,

One could pay more attention to publishing research results from the theses (in any form, also as publications in industry's periodicals), which could promote public awareness of university's activities, research topics, programmes offered. University in general and each faculty individually organise many activities and events providing information about study programmes (for example, Open Doors Day, Career Day, Information Day, participation in fair "School", industry events: Forest Days, Country Enters City, Forest Enters City, exhibitions in Rāmava, agricultural animal fairs in Vecauce, Cows Days, Sheep Days, trips to schools, Green Class of Latvijas Finieris, organised in cooperation with AS "Latvijas valsts meži", Scientists Night, Forestry Days (organised by Silava, LVM, MF, LLMZA - with participation of students, forest owners), Forest ABC (for pupils) etc.)

ESG 1.9. Inspection and regular review of the programme - LLU has its procedure for reviewing, supplementing and updating the course content (see Sec. 2.2.2), students contribute to improvement of programme and study process with their evaluation, and recommendations or

commentaries from alumni and employees are taken into account. All parties are involved in betterment of study programmes, the survey results are summarised, analysed and arranged according to priorities.

More attention must be paid to sequence of introduction of necessary improvements and control thereof. Meeting student expectations, needs and increase of student satisfaction in a short time is a challenge.

ESG 1.10. **Cyclical provision of external quality** – evaluation of external quality takes place every six years, taking into account the requirements of laws and regulations.

II - Description of the Study Direction (3. Resources and Provision of the Study Direction)

3.1. Provide information on the system developed by the higher education institution/ college for determining the financial resources required for the implementation of the study direction and the relevant study programmes. Provide data on the available funding for the relevant study programmes, as well as the sources of the funding for the scientific research and/or artistic creation activities and their use for the development of the study direction. Provide information on the costs per one student (for each relevant study programme of the study direction) by specifying the headings indicated in the calculation of costs and the percentage of the funding among the indicated headings.

According to LLU financial strategy, conduct and action policy, use of financial resources is managed by LLU Finance Planning Centre. Every year LLU Senate approves LLU combined budget revenue and expenditure distribution and budget which is prepared according to the (annual) Law On the State Budget. Combined budget estimate (financial planning and results) is discussed and updated in the work group “Work group for resource utilisation and development”, followed by approval in LLU Senate. The work group consists of faculty deans, chancellor, rector, science vice-rector, study vice-rector, head of the Finance Centre, head of Resource Accounting Centre, lawyer etc.

The main components of expense and revenue of the combined budget in 2019:

- 9,451,938 EUR for study process (of them 7,598,273 EUR for salaries and 587,108 EUR for scholarships, 882,271 EUR for covering total costs and 384,285 EUR at disposal of faculties);
- Tuition fee revenue 1,885,268 EUR which are distributed for teacher salaries at 1,121,161 EUR, covering of total expenditure at 377,053 EUR, and at disposal of all LLU faculties at 377,054 EUR;
- 4,483,825 EUR are allocated to science, of them 935,223 EUR make scientific base funding, 346,196 EUR make performance funding and 3,202,406 EUR are intended for other scientific projects.
- ERASMUS 506,850 EUR;
- Received donations 10,000 EUR.

The procedure for proportional division of budget revenue/expenses is approved in LLU Senate and 80% of it is intended for salaries and 20% for other expenses. 60% of expenses from paid studies are channelled for salaries and 40% for other costs (20% of 40% is given at a disposal of faculties

and another 20% for covering central costs). Dean of each faculty receives a monthly report on actual expenses of the faculty. The scientific base funding from the combined budget amounts to approximately 13% (50% of that amount is given at disposal of faculties and 50% are intended for covering central costs).

Faculties are informed regularly on their budget spending. Based on these reports, the faculty can make operative decisions on transferring individual expense item within the framework of total funding.

The number of study places from public funding is harmonised in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Life Sciences and Technologies (LLU). In the trilateral agreement on funding in 2020, it is stated that base costs of one study place are 1518.98 EUR, social provision (for undergraduate and graduate studies) is 164.34 EUR. Each thematic area of education has its own ratios, they are stipulated in the Cabinet Regulation "Procedure for financing universities and colleges from the state budget". In this thematic area study cost ratio is 1.8 and costs per student in 2020 were 2897.83 EUR (undergraduate programme), 4264.57 EUR in graduate programme and above 10,000 EUR in postgraduate studies (table):

Programme	Thematic group ratio	Costs per 1 student
Agriculture, professional Bachelor	1.8	2897.83
Sustainable Agriculture, acad, Bach.	-	3000.00
Agriculture, acad. Mag.	1.8	4264.57
Agriculture, Doct.	1.8	10234.44
Forestry, acad. Bach.	1.8	2898.02
Forest Engineer, prof. Bach.	1.8	2898.02
Sustainable Forestry, acad, Bach.	-	3000.00
Forestry, acad. Mag.	1.8	4264.86
Forestry, Doct.	1.8	10235.07
Food Hygiene, prof. Mag.	1.8	4264.88

Distribution of LLU combined budget consists of estimates of the faculties where the costs are divided by their type of expense. Costs are broken down into 4 main areas: salaries, scholarships, goods and services (incl. utilities), fixed capital (table, see also Sec. 3.1 of part 3).

Percentage distribution of costs by study programmes in 2020:

Programme	Salaries	Scholar-ships	Goods and services	Building of the fixed capital
Agriculture, professional Bachelor	76	6	22	3
Agriculture, acad. Mag.	76	6	22	3
Agriculture, Doct.	76	6	22	3
Forestry, acad. Bach.	72	7	23	4
Forest Engineer, prof. Bach.	72	7	23	4
Forestry, acad. Mag.	72	7	23	4
Forestry, Doct.	72	7	23	4
Food Hygiene, prof. Mag.	77	3	23	3

In 2020, academic Bachelor's study programme Sustainable Agriculture and Sustainable Forestry did not have any students, therefore it is not possible to show cost distribution. Larger number of students have economic benefits, since it reduces actual expenses per 1 student (at the same time common infrastructure is being used and academic staff remuneration is attributed to each student). It is essential, taking into account that the public funding for higher education is not sufficient. Distribution makes 60% for salaries and 40% for remaining costs.

Major part of the costs incurred in delivery of programmes under the study direction consists of salaries (72 to 77%) and includes also utilities costs, premises and equipment maintenance, repair of computers and other specific devices, maintenance, servicing and repair of stationery, transport costs (for example, study visits, traineeships etc.), services of other LLU structural units, costs of stationery, teaching materials, literature.

Specific equipment and devices necessary for delivery of study programmes are planned against the funding allocated on a yearly basis, but it is not sufficient therefore other sources of funding are sought and used to ensure quality and compliance of the study process.

Total revenue and expenses of the faculty are shown in the annual report which is presented to the Faculty Council.

LLU approves study fee annually with a rector's order. The following study fee was determined for the study programmes in the study direction with a rector's order in academic year of 2019/2020:

Programme and study levels	Full-time studies	Part-time studies	Full-time studies, in English
Agriculture, professional Bachelor	1900	1340	-
Sustainable Agriculture, acad, Bach.	-	-	3000
Agriculture, acad. Mag.	2140	-	-
Agriculture, Doct.	2440	1800	-

Forestry, acad. Bach.	1900	-	-
Forest Engineer, prof. Bach.	1900	1300	-
Sustainable Forestry, acad, Bach.	-	-	3000
Forestry, acad. Mag.	2140	-	-
Forestry, Doct.	2440	1800	-
Food Hygiene, prof. Mag.	1900	-	-

In addition to faculty's core budget, the academic staff and employees use also funding provided by ERASMUS+ for strengthening international cooperation, exchange visits and joint education projects. Engagement in ERASMUS+ projects allows not only strengthening the existing cooperation but also establishing new contacts. Engagement in delivery of intense education projects promote both knowledge exchange and language improvement, and elaboration of study materials and traineeship experience for students and contribute to recognisability. These measures contribute to development of study direction. In the reporting period the academic staff members of the study direction have engaged in delivery of several ERASMUS+ education projects.

The scientific research funding is built from the allocated scientific base and performance funding, from funding attracted in the projects and contracted research funding.

According to the Resolution No. 17-6 of 28.11.2017 "On evaluation of scientific activity efficiency of academic staff, leading researchers and researchers" adopted by LLU Science Council, spending of scientific base funding is aimed at scientific performance, expressed in points (contribution of each leading researcher and researcher is translated in points); necessary co-funding in projects; scientific infrastructure development (equipment, devices, software); support for scientific staff (leading researchers, researchers) – publication fee, participation in conferences, symposiums

The funding allocated and attracted from varied sources allows developing and cooperating with the industry, producers, other national and international scientific institutions and education establishments, to improve materially technical base, to promote and improve qualification of the academic and scientific staff, which generally improves the quality of study programmes included in the study direction.

3.2. Provide information on the infrastructure and the material and technical provision required for the implementation of the study direction and the relevant study programmes. Specify whether the required provision is available to the higher education institution/ college, availability to the students, and the teaching staff (the specific equipment required for the relevant study programme shall be indicated in Part III, Chapter 3 below the respective study programme).

Faculties engaged in delivery of programmes under study direction are located in different LLU objects. The Faculty of Agriculture is situated in the main building of LLU, in Jelgava Palace, and LF study block in Jelgava, 1 Street Strazdu. Materially technical base was created with a goal to ensure

agricultural studies and research. In the main building both well equipped shared premises (classrooms for lectures, seminars) according to the number of students and specially equipped premises and laboratories are used for study process. LF study building has several rooms for lectures (up to 50 places) and laboratories equipped according to study process.

The Forest Faculty is situated in Jelgava, 11 Street Akadēmijas where the main study building, featuring classrooms for lectures and delivery of specific courses is located, LLC Forest and timber research and development institute which gives access to study laboratories and practical work is located in a separate building in Jelgava, 41 Street Dobele. This institute is the most modern laboratory complex of its kind in all Baltic states (website <http://e-koks.lv/en/>).

The Faculty of Veterinary Medicine is situated in Jelgava, 8 Street K. Helmaņa and materially technical base was created to deliver studies in the veterinary medicine and food hygiene. Majority of students from programme Food Hygiene will have to attend lectures and classes in the institutes of the Faculty of Veterinary Medicine and Faculty of Food Technology.

Studies in undergraduate programmes are delivered in all faculties of the university (Faculty of Agriculture, Forest Faculty, Faculty of Veterinary Medicine, Faculty of Information Technologies, Faculty of Food Technologies, Faculty of Environment and Construction Sciences, Faculty of Economics and Social Development) regardless of different locations of the faculties and shared materially technical base of LLU and that of other faculties in form of study and science materials are used. Common premises include the large classrooms, library, also reading-room, Hall etc.

When compiling the schedule of lessons, the instructions of the academic staff about the place of the specific study course are taken into account - a specific faculty, where the quality of the study course (lectures, practical work or laboratory work) can be ensured. The distance between faculties is also taken into account in order for students and lecturers to come to lessons on time. If the implementation of study courses does not require specific laboratories or practical work premises, lessons are planned in the LLU central building or auditoriums of faculties.

Considerable resources have been invested recently in technical materials offered for the classes. All LLU buildings have wi-fi network, students and academic staff can access it with their username and password. Students can use free access computers which provide access to internet, databases and student systems. One can also print documents. All lecture classrooms have multimedia projectors or screens which are connected to computers. Computer classes which are equipped with various data processing programmes are available for studies and they are used for delivery of certain courses, and also graduate and postgraduate students can use them for data processing.

Students and academic staff members can access well-developed IT infrastructure and virtual study environment: websites of LLU and faculties (publishing of updated information about organisation of study process, schedule of classes, notifications, topical information etc.); *MansLLU* (intranet where information and documents are published for internal use both for students and university lecturers and employees); e-studies platform (elaborated on the basis of Moodle, it hosts study materials, auxiliary materials, ensures communication with students, evaluates student knowledge; it has video conference system BigBlueButton which is used for video lectures and sittings). LLU Information System (IS) with course register (free access) and system where students and university lecturers receive the necessary information and relevant services, contains also information about courses and programme register, surveying system and feedback (authorised access). LLU Information System ensures data input and processing for employees, programme directors, heads of the structural units (authorised access). Programme directors in this system can access student progress, orders and other information. LLU has its document management system.

Computer, network and other devices and IT services can be rated as good however it must be

taken into account that quality and efficiency of studies call for updates. It must also be noted that study programmes included in the study direction are specific and unique, and they must be provided with suitable equipment, devices, tools and software, which must be accordingly maintained and updated.

Description of existing LLU infrastructure and planned investments is available in document "Description of planned LLU investments", which is available on the website: https://www.llu.lv/sites/default/files/2020-05/LLU_Planoto_investiciju_raksturojums.pdf, in Latvian.

Graduate and postgraduate studies mainly take place in the premises and laboratories of the Faculty of Agriculture, Forest, Veterinary Medicine, additionally using also laboratories of other faculties and structural units for studies and elaboration of theses. For example, courses in graduate programme Food Hygiene area delivered in classrooms and laboratories of the Faculty of Veterinary Medicine and Faculty of Food Technology.

Not only specialised laboratories with all the equipment available in the faculty are used for elaboration of Master and Doctoral theses, but also LLU laboratories, for example, Scientific Laboratory of Biotechnologies (with departments of agronomy analyses, molecular and microbiological and smart technologies,, <https://www.llu.lv/en/research-laboratory-of-biotechnology>), Scientific Laboratory of Forest and Water Resources (<http://www.murzl.llu.lv/>, in Latvian), Forest Research Station (<https://www.agenturamps.lv/lv/www.agenturamps.lv/lv/> and other laboratories <https://www.llu.lv/en/research-laboratories>). Materially technical base of LLU LF Study and research farm "Pēterlauki" is used for elaboration of theses (arrangement, maintenance etc. of trials, mainly in field crops direction) and materially technical base of SIA LLU Study and research farm "Vecauce" (mainly in animal husbandry and field crops direction). The necessary infrastructure and materially technical provision are suitable for delivery of studies and research process. Graduate students can elaborate their research in suitable laboratories, in some cases one can highlight problems related to the research costs. These cases are important if the research is conducted outside a project and, for example, costs of reactants must be covered.

Equipment bought within the framework of project VNPC is used for the study process and for the same purpose buildings and structures where investments were made within the framework of VNPC project, are used. Investments worth 1,229,303.47 were made within the framework of ERAF project "Development of scientific infrastructure of national significance research centre for forest and water resources" (2012-2015). Investments worth 3,995,513.00 EUR were made within the framework of ERAF project "Improvement of modern scientific materially technical base within the framework of the national significance research centre for agricultural resources use and food" (2012-2015). Development of LLU infrastructure has been promoted also by subsidies allocated by the Ministry of Agriculture. More than 2 million euro were invested in a form of subsidies from the Ministry of Agriculture in development of LLU scientific infrastructure in 2015 and 2016. Part of the scientific infrastructure is used for the needs of graduate and postgraduate students. Premises, classrooms, computer classes and laboratories necessary for delivery of STEM programmes were equipped and modernised within the framework of Project No. 8.1.1.0/17/1/001. Classrooms were upgraded when implementing a part of projects "Development and strengthening of institutional capacity of LLU and scientific institutions' infrastructure under its auspices" (2017-2021) as well as within the framework of a project financed by LR ZM and VARAM "Provision of energy efficiency of Jelgava Castle" (2016-2020).

Special equipment purchased within the framework of previously mentioned projects are used for improvement of materially technical base of the programmes included in the study direction.

Students and university lecturers may use (1) services offered by the Department of Technology

and Knowledge Transfer (TEPEK) because the centre aims at promoting protection of intellectual property of scientists and companies and commercialisation of research results in LLU; (2) services of dormitories; (3) services of Sports Centre and (4) services of LLU Fundamental Library (described in more detail in next Section).

All LLU premises are suitable for studies, accessibility elements for persons with disabilities are provided in LLU buildings, dormitories and faculties to ensure education accessibility for all students. Some buildings have elevators, especially equipped restrooms, ramp. Requirements of regulations on quality of classrooms have been complied with.

3.3. Provide information on the system and procedures for the improvement and purchase of the methodological and informative provision. Description and assessment of the availability of the library and the databases to the students (including in digital environment) and their compliance with the needs of the study direction by specifying whether the opening times of the library are appropriate for the students, as well as the number/ area of the premises, their suitability for individual studies and research work, the services provided by the library, the available literature for the implementation of the study direction, the databases available for the students in the respective field, the statistical data on their use, the procedures for the replenishment of the library stock, as well as the procedures and options for the subscription to the databases.

In the beginning of studies, each student is given a username and password which can be used in LLU IT systems intended for students: e-studies platform, MansLLU, LLU e-mail, student's personal account, including library services.

Programme director, vice-dean or academic staff member in charge introduces students to university's IT tools, procedure and requirements of their use and features of e-studies platform, in the beginning of studies, in a section Introduction to Studies (this section is delivered in different courses in Semester 1).

E-studies and Moodle platform are used as a tool for organising study process in each particular course. It includes study materials, tests and homework, independent tasks, and assessment can be put there. Additionally, one can see a calendar of upcoming events, discussion forums, topical information which the academic staff member can give to students. Majority of courses which are placed in e-studies contains links to external information resources, video lectures, video conference or video meeting option (very demanded during the last year) with a recording function. Some courses offer also electronic tests.

Programme director and/or vice-dean informs students about topics of theses and potential supervisors. For example, topics of Bachelor theses and application procedure are published on LF website: <http://www.lf.llu.lv/lv/studiju-nosleguma-darbu-temu-izvele>, in Latvian.

LLU e-studies platform offers basic lessons and instructions on how to use Moodle platform and its tools, tips, students can also read information about scholarships and academic staff members can apply for training, professional development courses via e-studies platform.

All students and academic staff have access to LLU Fundamental Library (LLU FB), spacious reading-room and subscribed databases. The library has text-books for mastering courses, while the reading-room has also scientific monographs and periodicals in one copy. Library of national importance accredited by LLU FB which provides information resources to users.

LLU FB collection is replenished (collection fund is supplemented) generally in two ways: (1) according to suggestion from the academic staff members (a form that is available on FB website was elaborated; <https://lufb.llu.lv/lv/pakalpojumi/gramatu-iegade-llu-fb-krajumam>, in Latvian), once the application is received, a potential purchase of a particular book (according to “Collection Replenishment Policy” elaborated by FB, the main priority is LLU programmes and research directions) is considered; (2) library follows-up the news and informs about them university lecturers, the university lecturers mention particular editions that are required for the study process.

In compliance with the Mandatory Copy Law, LLU FB as a library of national importance receives one copy from each printed material and electronic issue in areas relevant for LLU.

Students can receive LLU FB collections by using their subscription, and industry publications are available for studies and research also in study literature subscription and deposit library of UN Food and Agriculture Organisation, and also to work with information sources in the reading-room.

In order to find the information sources which are not available in FB, students can use subscribed databases in LLU network or outside of it, LLU FB Reference and Information Centre, as well as interlibrary subscription services.

One can read information about distribution of library collections by scientific fields on LLU FB website (<https://lufb.llu.lv/lv/informacija-par-biblioteku/bibliotekas-krajums>, in Latvian), which reveals that 38% of collection contain materials in agricultural science, 10% in natural science and 9% in other scientific disciplines.

The library’s opening hours are tailored to the needs of the library’s main users – students and teaching personnel. On weekdays, the library is open to its users from 8.30 to 19.00, on Fridays – from 8.30 to 17.00. The library is also open to the public on the first Saturday of every month, from 9.00 to 14.00. The working hours of the library’s reading room and Reference and Information Centre during the period of individual studies and examinations are extended to 24.00. The catalogue and online databases are accessible all the time 24/7.

LLU FB reader service total area is 787.1 m². The reading room has comfortable workspaces both in the hall (396 m²) and on the balcony (223 m²). The Internet and Wi-Fi are available. The reading room has also a lounge with comfortable sofas. There is also the quiet reading room. The Reference and Information Centre has desktop computers and provide qualified consultant services.

Services offered by the library

The following **free-of-charge services** are available at the LLU FB:

- use of computers with access to the Internet and Wi-Fi;
- an opportunity to use Autodesk EDU Master Suite 2018 (AutoCAD, AutoCAD Structural Detailing, Autodesk Robot Structural Analysis Professional, etc.), CorelDRAW X7, SPSS Statistics v21 and VISIO 2013;
- 4/7 access to library-based, subscribed and free online databases;
- borrowing of books, periodicals and other documents;
- training in use of full-text and bibliographic databases, a computer and the Internet;
- training for LLU teaching personnel, including online, in how to search for and retrieve information, create a personal account, add research papers from the LLU teaching personnel and researcher research paper database to the LLU IS personal account, use Mendeley, create a researcher identification number ORCID and research ID etc.;
- classes for doctoral, master and bachelor students, including in English;
- instructional aids for each target audience (scientists, students, other users) that are sent

them on request;

- provision of references and advice on the library and its use;
- editing of bibliographies, a delivery of examples of a bibliographical description on request via e-mail;
- tailor-made exhibitions.

The following **paid services** are offered by the LLU FB:

- copying (coloured, black and white),
- printing (coloured, black and white),
- scanning,
- provision of written thematic references,
- SBA and SSBA services (costs of postal services must be covered),
- delivery of copies of documents (at the supplier's price),
- spiral binding.

The library offers the following **e-services**:

- use of the electronic catalogue 24/7,
- electronic book reservation, expiration date extension for borrowed items 24/7,
- use of the unified search engine PRIMO DISCOVERY,
- 24/7 access to library-based, subscribed and free online databases (both full-text and bibliographic),
- an opportunity to connect to subscribed e-journal and e-book databases outside the LLU network by using EZproxy and the LLU IS user account 24/7,
- use of Mendeley – a scientific information search application,
- an opportunity to use other online information resources from the library website,
- access to the electronic catalogues of the LLU Information Centre and Information Offices (BIS ALEPH500),
- an opportunity to use instructional materials on information resources, available on the library website, that have been prepared either by the LLU FB or by database maintainers,
- an electronic delivery of documents,
- “Write to the Librarian” on Skype,
- a Book Request Form on the library's website

Available databases in the relevant field, statistics of their use

LLU Fundamental Library offers its users various online databases and databases in other media. The library has bought search software *PRIMO DISCOVERY*, which allows searching in subscribed and free-access online databases, electronic joint catalogue of national importance, LLU FB databases (LLU academic staff and researcher publications, LLU Master theses etc.). When registering with LLU IS user account, one can view their user accounts and extend the term of handed out copies, to order copies, access full texts in the subscribed online databases, save their search results. The library website has “[Information search assistant PRIMO](#)”. Access to online databases is provided 24/7 in LLU network, as well as for authorised users outside LLU network through *EZproxy* and LLU IS user account.

Before offering a database to users they are analysed to understand search possibilities, thematic coverage, chronological framework and access possibilities. Information is being prepared about databases and their descriptions are placed on LLU FB website.

LLU FB users can search for information for the purpose of specific programmes in the study direction also in economics and management sectors in the following foreign and Latvian databases:

- *CAB Abstracts*,
- *CRC Press e-grāmatas*,
- *EBSCO eBook Academic Collection database covering a wide range of multidisciplinary topics and containing more than 228515 e-books*
- *EBSCO host datubāzēs Academic Search Complete, MasterFILE Premier and others*,
- *ScienceDirect Journals*,
- *Scopus*,
- *SciVal*,
- *Web of Science*,
- *Wiley Online Journals*,
- *Lursoft*.

Intensity of use of available databases by students, academic staff members and scientific staff is analysed on a regular basis. More than 73.6 thousand connected sessions and more than 408.7 thousand of searches were measured in the beginning of 2019. Most used database in terms of connection sessions was *EBSCO* and *ScienceDirect Journal*, and in terms of searches – *EBSCO* and *Britanica*.

Various online databases with trial period were offered regularly in cooperation with the Culture Information System Centre. LLU FB employees carefully evaluate statistics of database use, whether subscribed or for trial period. Thus, taking into account the trial statistics and noting the recommendations of academic staff members, a decision is made on databases to be subscribed by the library.

The databases created by the personnel of the LLU FB are also offered to readers:

- research papers by LLU teaching and research personnel;
- doctoral dissertations defended at LLU;
- conference proceedings of LLU;
- patent research papers by LLU teaching and research personnel;
- publications on LLU.

LLU FB as a repository library of UN Food and Agriculture Organisation and AGRIS national centre participates in creation of international database AGRIS.

LLU FB is situated in the main building at 2 Street Lielā, Jelgava, whereas the faculties are situated in different locations, therefore in order to provide student-centred approach and accessible education process, some faculties have their information, research and communication centres or contact points:

- The Forest Faculty has its Information Centre where methodological teaching materials for acquisition of study courses, collection of papers from international scientific conferences and scientific journals are available and students can use also computers. Faculty's website features materials from text-book series "Forest Education Library": <http://mf.llu.lv/lv/meza-izglitibas-biblioteka>, in Latvian;
- The Faculty of Veterinary Medicine has its Information Centre where specific literature is available on veterinary medicine and food hygiene. Here, students can use four stationary computers, make copies and print study materials.
- The Faculty of Economics and Social Development has its Scientific Information Centre with suitable periodicals and information sources of the industry;
- The faculty of Environment and Construction Sciences has its Information Centre with periodicals and information sources matching the industry and a possibility to print large-scale works. Journals and collections of articles are published on the website

<http://vbf.llu.lv/lv/journals-and-proceedings>.

Electronic catalogues of these centres can be viewed also on LLU FB website: <https://llufb.llu.lv/en/catalogues-and-databases>.

The Faculty of Agriculture is situated in the same building where LLU FB, therefore it does not have a separate centres, and one can find collections of scientifically practical conference and seminar theses and articles and collection of theses from scientific student conferences in the faculty's website <http://www.lf.llu.lv/lv/konferences>, in Latvian.

Students can get specific scientific literature (mainly collections of scientific conference articles, narrow specialisation monographs or books and other information sources) from each academic staff member which are offered specifically by the supervisors of theses.

Resources invested in development of LLU FB grow in numbers from year to year and they exceeded 100 thousand in 2018, of which approximately 30 thousand were used for buying books, more than 64 thousand – database subscription, approximately 10 thousand – periodicals subscription and more than 7 thousand for subscription of ALEPH. At the end of 2018, LLU FB collection had 406,593 copies, 123,949 titles.

In general, LLU FB resources and services were rated as very good and meeting demand of students of the study direction's programmes and university lectures thus providing a capacity for successful acquisition of particular study course. It would be desirable to have more specialised literature and e-books in the Latvian language. The bibliography list in the course descriptions is renewed and supplemented by the academic staff, and the library informs which literature sources are available in the library, but unfortunately not all bibliography sources are available and academic staff members cannot demand (order) them. Academic staff members can also order e-books, information about this possibility is regularly sent and academic staff are regularly informed.

3.4. Provide information on the procedures for attracting and/or employing the teaching staff (including the call for vacancies, employment, election procedure, etc.), and the assessment of their transparency.

At LLU, the attraction and employment of teaching personnel (incl. job vacancy announcement, recruitment, election etc.) is governed by the Statute of Latvia University of Life Sciences and Technologies on Academic Job Positions approved by the LLU Senate. Available on the LLU website: <https://www.llu.lv/index.php/lv/nolikumi>, in Latvian.

Selection. Number of positions of professors, assistant professors and assistant professors in relevant science sub-branches is aligned with the financial possibilities and needs of the program delivery, as decided by the LLU Senate following a decision of the Board of Faculty. Assuming an academic position in LLU is subject to an open competition, stipulated in the *Regulation on Academic Positions of the Latvia University of Life Sciences and Technologies*.

Requirements. Candidates to the academic positions must have a scientific or academic degree as specified. Requirements for candidates to the academic positions are determined by the Law On Higher Education Institution.

All applicants for academic positions have to meet the following requirements:

- knowledge of the official language in accordance with the requirements of the regulatory

framework;

- knowledge of foreign languages to the extent required for fulfilling duties of the academic position (including conducting classes in these languages);
- continuous improvement of their academic and scientific qualifications.

Elections. Based on the recommendations received from the structural units on academic vacancies, LLU Human Resources Department prepares vacancy advertisement draft and submits to the Commission of LLU Academic Staff and Structural Unit Policy (henceforth – Commission). According to a resolution of the Commission sitting, the Human Resources Department prepares a draft on vacant academic positions and submits it for approval to LLU Senate. Once the Senate has adopted a resolution, the Human Resources Department announces an open competition to vacant academic positions by publishing an advertisement in portal “Latvijas Vēstnesis”, on LLU website.

The elections take place in a covered ballot: for professor and associated professor position – in relevant industry’s professor councils not later than within four months of announcing the competition; university lecturers, leading researcher, researcher, lecturer, assistant and scientific assistant positions – by faculty councils not later than within three months of announcing the competition; leading researcher, researcher and scientific assistant position – by scientific councils of the scientific institutes not later than within two months of announcing the competition.

Documentation, previous scientific activity of candidates for the academic positions are evaluated, in some cases open lecture is organised which is prepared and led by the candidate to the position.

The rector signs an employment contract with the person elected for a particular time.

If LLU has a vacant position, LLU Senate may decide not to announce competition if suggested so by the faculty council. In this case the rector can employ a visiting professor, visiting associated professor, visiting university lecturer, visiting lecturer or visiting assistant for up to two years. Information about the vacancy is also published on the LLU website: https://www.llu.lv/index.php/lv/darba_piedavajumi/view_work (in Latvian) or <https://www.llu.lv/en/job-offers>.

The individual academic work of academic staff is planned each year according to the *Regulation on LLU academic work calculation* and rector’s order *On planning, accounting and control of individual load of the academic staff in academic year* which determines constituents, regulations, accounting and control procedure of the work of academic staff.

Academic work salary is defined on the basis of Regulation of the Cabinet of Ministers *Regulation on teacher salary*: - <https://likumi.lv/ta/id/283667-pedagogu-darba-samaksas-noteikumi> (in Latvian) and order of LLU rector *On teacher salary*

Academic staff qualification and competences are constantly improved, giving a room for teaching skills development, bettering skills of English and professional development in the industry.

Professional development of academic staff includes both acquisition of suitable professional development programme and experience exchange and participation in conferences and seminars, which is approved by the documents issued at the beginning of such measures.

The academic staff is entitled to a paid academic leave of six calendar months every six years to be devoted for scientific research or scientific work outside their primary work.

A procedure according to which the professional development is implemented is determined by the Regulation of the Cabinet of Ministers *Regulation on education and professional qualification necessary for teachers and procedure for professional development of professional competence of teachers* (<http://likumi.lv/ta/id/269965>, in Latvian). This regulation states that the academic staff of the university must acquire the required qualification in professional development programmes of

further education on innovations in higher education, university didactics or management of teaching work in the scope of 160 academic hours (including at least 60 contact lessons) until the end of election term of the academic position. LLU has its professional development programme for higher education teachers "Innovations in University Didactics". The goal of the programme is to improve knowledge of higher education teachers in university didactics and possibilities to use them in teaching activities. A certificate is granted upon mastering this programme.

3.5. Specify whether there are common procedures for ensuring the qualification of the academic staff members and the work quality in place and provide the respective assessment thereof. Specify the options for all teaching staff members to improve their qualification (including the information on the involvement of the teaching staff in different activities, the incentives for their involvement, etc.). Provide the respective examples and specify the way the added value of the possibilities used for the implementation of the study process and the improvement of the study quality is evaluated.

Requirements for the academic positions are defined by the Law On Higher Education Institutions, qualification of academic staff is defined in the regulation approved by LLU Senate *Regulation of Latvia University of Life Sciences and Technologies on academic positions*. The invited academic staff members (which are not elected in academic positions) must meet the same requirements and qualification as the academic staff properly elected.

LLU has described processes which ensure academic staff qualifications and work quality. One of them is academic staff elections and re-election (LLU Regulation on academic positions).

Development of academic staff, qualification and assessment are important processes of human resources, which promote professional development of existing employees. LLU has its academic staff motivation system introduced since 2017 (internal document, LLU Study Council resolution No. 2.4-13/8). The created motivation system allows receiving an additional payment to the salary for good quality and well-rated work. Motivation system includes evaluation of academic staff members in 14 criteria, which are gathered in 5 groups of indicators: student evaluation; preparation of study materials and study process (including excellent and outstanding assessment given to theses); organisational work; professional improvement and scientific work. Each indicator has its weight, and the score is summed (one point equals certain amount in euros). This system allows evaluating the activity, work quality of academic staff member and arrive at a salary based on uniform criteria.

Skills and performance of academic staff members are evaluated from the rating given by students anonymously in LLU IS at the end of each semester once the course is acquired. Students evaluate the work of academic staff in 6 positions, in a scale system from very high (5 points) to very low (1 point). The resulting assessment is available to each academic staff member individually, programme director, institute director. The academic staff member improves or better their study course, eliminate shortcomings from their work based on the results obtained and commentaries/recommendations provided. Programme director and the head of structural unit take into consideration student feedback, as much as possible, when organising the work for the next study year.

As mentioned in previous sections, LLU has its lecture visiting procedure for experience exchange and control of performance.

In general, the quality of study process is ensured in several levels. The university lecturer must individually ensure good quality study process by independently building their competence (including conducting of research and publishing research results in scientific journals or collection of articles, participate in industry and international conferences, regularly review study results, improving the course content, share academic experience).

LLU offers to the academic staff several options to improve their qualification: (1) ERASMUS+ mobility programme both for delivering lectures and experience exchange; (2) participation in annual LLU Academic Conference, where one of the goals is sharing personal experience with colleagues; (3) participation in international scientific conferences, symposiums (scientific base funding) is funded to an extent possible; (4) improve teaching competence in the professional development programme organised centrally by LLU for teachers "Innovations for University Didactics" (these courses are mandatory for elected academic staff every six years, which is also done by the academic staff involved in the field of study). LLU Language Centre offers English course to improve the skills of university's academic staff (several lecturers used this opportunity) . Qualification development courses "Management system for building e-courses in Moodle" has been provided since 2010, and in recent years this course has been integrated in the development programme "Innovations in university didactics". For example, English skills have now been improved by around 44% of lecturers.

LLU has been organising annual competition of books and study materials since 1998 aimed at promoting preparation and publishing of new books and study materials (including in electronic format).

LLU implements several ESF projects (1) 8.2.1.0/18/A/007 "Consolidation of LLU study programmes and elaboration of new programmes" within the framework of which two academic Bachelor's study programmes "Sustainable Agriculture" and "Sustainable Forestry" were elaborated and licensed under the study direction, study course materials are elaborated; (2) 8.2.2.0/18/A/014 "Development of LLU academic staff" which is aimed at developing the academic staff members and improve study quality, improve competence, cooperation with industry by engaging doctoral students and visiting lecturers from abroad; (3) 8.2.3.0/18/A/009 "Improvement of LLU Administration" where academic staff of the study direction is engaged by improving the programme content, English skills, professional IT skills and attending internship in industry's companies. Within the framework of the above-mentioned three projects, the IT skills of the academic staff have been improved (87 lecturers have studied various topics) and English (25 lecturers in total), 18 lecturers have used the opportunity for internships in the industry, 8 doctoral students have been attracted as academic staff. For the new study programs, 59 lecturers have participated in the development of study courses, but 33 lecturers have participated in the preparation of study materials (about 50%).

Academic staff praises engagement in various pedagogic and professional development events which are offered and organised by the university. The acquired skills are used in improvement of course materials, communication with students, updating course programmes. The management notices benefits, for example, through elaborated study materials, student feedback, new networking or scientific projects of national or international scale. Part of academic staff members involved in study direction participates in faculty decision-making bodies (council) and methodological commissions thus the obtained experience can be applied to work organisation. Qualification improvement may allow the academic staff member, working at next level study programmes, receive a higher salary.

3.6. Provide information on the number of the teaching staff members involved in the implementation of the relevant study programmes of the study direction, as well as the analysis and assessment of the academic and research workload. Provide the assessment of the incoming and outgoing mobility of the teaching staff over the reporting period, the mobility dynamics, and the issues which the higher education institution/ college must tackle with regard to the mobility of the teaching staff.

Both elected and non-elected academic staff members participate in delivery of the study direction and programmes. 190 university lectures, equalling to 44 workplaces, were involved in implementation of study direction in academic year of 2020/2021. Majority, i.e. 34.3 workplaces, is found in Bachelor's study programmes. In terms of academic positions, proportionally the largest part of programme is delivered by lecturers (36%) and university lecturers (24%), associated professors (12%), professors (15%), assistants (2%); and scientific assistants, laboratory managers and leading researchers (11%) are also involved in study process. More than 56% of university lecturers involved in delivery of study direction hold a scientific degree, which allows teaching students a science-based understanding.

The academic work of academic staff is planned each year according to the *Regulation on LLU academic work calculation* and rector's order *On planning, accounting and control of individual load of the academic staff in academic year* which determines constituents, regulations, accounting and control procedure of the work of academic staff. Academic staff members engaged in the study direction and programmes plan their teaching workload according to the programme of each study semester and academic year.

Academic staff biographies (CV in Europass format) and basic information about academic staff members involved in delivery of study direction, specifying their qualification (degree), election status in university, study programme and courses delivered by them, evidence of the knowledge of official language and foreign languages (if applicable) are provided in annexes.

Academic staff members of the study direction, in addition to the academic work, are engaged also in science. Results of the scientific activity of academic staff are gathered once a year and included in the activity summary. Scientific activity performance is related to remuneration principles. The scientific activities of academic staff are included in person's CV.

Academic staff mobility is conducted on the basis of ERASMUS+, BOVA, Nordplus programmes. LLU has cooperation agreements with other EU universities where programmes similar in content are delivered. The academic staff can head for lecturing visits (delivery of classes) and experience exchange. More than 45 academic staff members involved in the study direction have participated in lecturing and experience exchange mobility. In general, the number of academic staff members who have gone to experience exchange visits is similar, however academic staff members of VMF head for experience exchange visits more often. On average, 4 academic staff members go to deliver lectures and 3 head for experience exchange each year. Academic staff members go to deliver classes or exchange experience to different countries, including Lithuania, Estonia, Great Britain, Italy, Romania, Slovakia, France, Sweden, Turkey, Poland, Germany, Spain, Belgium, Finland, Czech Republic, Russia, Albania etc.

Incoming staff mobility in the programmes under the study direction are mainly implemented in ERASMUS+ programme. Terms of cooperation agreements envisage exchange of university lecturers between universities which implement programmes with matching content. Before admitting the visiting university lecturers, the content and level of studies are harmonised to

ensure complete attendance of lectures and added value for the course. Also, the scope of interests of experience exchange visits is harmonised to completely meet its goals. 90 visiting university lecturers delivered lectures in ERASMUS+ programme, 6 academic staff members engaged in experience exchange from cooperation universities in the reporting period.

Cooperation projects with involvement of academic staff members and students from the study direction participated in ERASMUS+ (K2) mobility programme, for example, creation of Free Access Central European Soil Database (2015-2018), Internationalisation of work-based education in agrarian business sector (2016-2018), Climate change in agriculture (2017-2020), Share your soils (2019-2022).

Participation of academic staff members in mobility programmes depends on the academic workload and engagement in management or implementation of different projects therefore it changes from year to year. There are often the cases when an academic staff member of a particular course has no replacement (or their colleague is very busy) and it complicates a possibility to use mobility. As already stated, workload in the project management and participation prevents from using opportunities offered by the mobility programme to a greater extent.

The total number of academic working hours of the academic staff in the study direction per year is 41518 hours, of which the largest amount of hours is 18519 hours for lecturers and 8373 hours for assist. professors, 8243 hours for professors and 5661 hours for associate professors. The workload in research varies from year to year, and by 2020 the workload of all academic staff in study direction was 29 full-time equivalents (on average 0.17 PLE per person).

Despite the obstacles encountered, academic staff mobility allows introducing higher educational institutions which cooperate with university, in programmes implemented by it, particular faculty and its capacity which encourages foreign students to use opportunities of the mobility programme for studies or traineeship in LLU,

In annexes 6, 7 and 8, please refer to the information on academic staff members involved in the study direction, their CV and statistical data on incoming and outgoing mobility of academic staff members.

3.7. Assessment of the support available for the students, including the support provided during the study process, as well as career and psychological support by specifying the support to be provided to specific student groups (for instance, students from abroad, part-time students, distance-learning students, students with special needs, etc.).

LLU supports students in different ways:

- Informative - websites of LLU and faculties feature study information, curriculum, programme content, scholarships, admission procedure and necessary documents. LLU intranet MansLLU has internal normative and methodological documents, tips for e-studies environment etc. published.
- Methodological - consultations on acquisition of courses on-site and off-site (through e-studies platform, e-mail, BBB and others); e-studies have information, requirements and materials published for successful course acquisition; database catalogue is available in LLU FB, necessary literature source can be found, booked and its return term followed in the library catalogue (including extension of return term if necessary); methodological instructions for elaboration and execution of various study works are published on websites

of faculties;

- Cooperation with industry – study visits to industry’s companies, scientific institutes, farms, non-governmental organisations; visiting lectures with industry representatives in certain study courses to understand what knowledge, skills and competences are required; support for ensuring professional traineeships is provided where necessary; visiting of industry exhibitions.
- Technical – prevention of problems in e-studies platform; problems with internet;
- Financial – scholarships, study fee alleviations according to laws and regulations and procedure stated in LLU.

Financial support

During the studies students can receive financial support in form of scholarships (<https://www.llu.lv/stipendijas>, in Latvian). Students can compete for:

1. State scholarship – monthly scholarship in graduate and undergraduate studies amounts to 99.60 EUR (it was increased to 200 EUR per month during COVID-19), and for postgraduate studies – 113.83 EUR;
2. Single scholarship – in a semester a student can apply to single scholarship which amounts to 2 minimum scholarships;
3. Scholarship for acquisition of scientific degree – this scholarship resembles a loan and amounts to 85.37 EUR (granting of new scholarships was discontinued as of 1 March 2020).
4. LLU Development Fund (LLU AF) scholarship – the fund offers students 18 scholarship programmes (from 40 to 1,500 EUR per month). There are both monthly and single scholarships).

Students studying in a study direction can participate in the following scholarship competitions:

- Undergraduate programmes:
 - 9 scholarship programmes (Kārlis Ulmanis, LLU Senate, Jānis Čakste, Mirdza Oškalne, Jānis and Millija Kāvuši, Jānis Rūvalds, Artūrs and Ērika Gerhards, LLU Student Self-Government, the Vagners Scholarship (for LF, VMF, TF, VBF students).
 - Personalities’ scholarships of the faculties: LF – Jānis Bergs and Pauls Lejiņš scholarships (for undergraduate and graduate programmes), MF – Arvīds Kalniņš scholarship (for undergraduate programmes).
 - Patrons’ scholarship for undergraduate students: Alfrēds Seržāns scholarship (for LF students)
 - Scholarships offered by companies and NGOs: AS “Rīgas Dzirnāvnīeks” scholarship (for LF and PTF students), Latvi Dan Agro scholarship (for LF, VMF, TF students), scholarship of Latvian Society for Agronomists (for LF students).
- The students of graduate programmes can run for:
 - Kārlis Ulmanis, LLU Senate, Jānis Čakste, Mirdza Oškalne, Jānis and Millija Kāvuši scholarships and one of personalities’ scholarships of the faculties
 - Scholarship of Latvian Association of Agriculture Cooperatives (LLKA) for graduate students in MF, LF and ESAF if they elaborate a thesis on topics relevant for LLKA.
- Students studying in doctoral programmes may compete for Jānis and Millija Kāvuši scholarship.

Study fee alleviations

LLU offers study fee alleviations (50-100%) to the following students with passing grades:

1. Employees of LLU who also study in postgraduate programmes.
2. Children of LLU employees.

3. Persons with group I and II disability.
4. Orphans or persons who are not supported by their parents.
5. Studying sportsmen.

LLU provides a **support for foreign students** in the following issues:

- they can apply for studies via e-admission system Dream Apply which provides partially formalised admission procedures thus alleviating applicant's communication with LLU; SSC coordinators individually respond to specific questions of applicants;
- All foreign students are given a place in well-arranged student dormitories;
- In order to introduce full-time and exchange students to LLU studies and everyday life and Latvian culture, a special Welcome Week is organised for them in the first week of each semester during which corporate networking takes place;
- LLU SSC provides technical support in receiving/extending visas, residence permits and insurance matters;
- LLU SSC and faculties' external coordinators and directors of study programmes inform foreign students about internal LLU regulations and application practice, consults in matters of studies and daily life, helps executing documents, solving problems etc.
- LLU has "Erasmus Student Network" group and LLU Student Self-Government which organises leisure and culture events of the students.
- External affairs coordinators of LLU inform foreign students about available healthcare at general practitioners and Jelgava out-patients' hospital and accompany them if needed;
- Foreign student survey (after each semester) was introduced as of academic year of 2019/2020 on delivered courses which show their satisfaction with the quality of such courses.

LLU Lifelong Learning Centre hosts a movement Excellent Students of LLU, where creative and talented students volunteer as LLU ambassadors throughout Latvia. Students who have engaged in this movement develop their teamwork skills, improve their organisational skills, develop creative and critical thinking. These students represent LLU and faculties in different events, exhibitions, career or project days, advertising etc. Students can attend a number of informal education courses in LLU Lifelong Learning Centre (some of them enrich already acquired courses).

Technical support is provided by LLU Information Technology and Scientific Equipment Centre (<https://www.llu.lv/index.php/lv/llu-informativa-sistema>, in Latvian), which provides LLU IS user accounts to students and employees so that they can access personal data and data on study process, use wi-fi internet in LLU buildings and dormitories, LLU e-mail, LLU intranet (MansLLU), e-books, e-journals subscribed by the library and trial databases and library's search programme PRIMO DISCOVERY.

The e-study methodologist of LLU Study Centre provides technical and methodological support for all students and academic staff.

There is currently no special career and psychological support point at the university. The students have expressed such a need for the university management, which has started evaluating the possibilities of providing psychological support.

Indirectly, for their professional development, students can use the principle of "open university" - in addition to studying the study course they are interested in as a listener (<https://www.mc.llu.lv/pakalpojumi/atverta-universitate-klausitaji>, Latvian only).

Programme directors, vice-deans, staff of faculties' dean office, as well as some academic staff (mainly final thesis supervisors) provide invaluable support in study process, where students can come and talk about any issues. Often study program directors, vice-deans and deans also solve

students' psychological problems, listen to everyday difficulties, solve them as much as possible.

II - Description of the Study Direction (4. Scientific Research and Artistic Creation)

4.1. Description and assessment of the directions of scientific research and/or artistic creation in the study direction, their compliance with the aims of the higher education institution/ college and the study direction, and the development level of scientific research and artistic creation (provide a separate description of the role of the doctoral study programmes, if applicable).

Scientific research in LLU takes place according to “LLU Strategy 2015-2022” where three main long-term goals are defined: excellence in research, high quality studies and efficient university management which allows purposeful and useful utilisation of resources.

Research in the study direction is conducted in bioscience section where the main activities are related to agriculture, forestry and veterinary medicine. The priority research direction in the biosciences section is chosen based on the needs of economic industries and scientific competence, at the scope and quality of resources available, as well as consulting with the stakeholders, including entrepreneurs and cooperation scientific institutions. The main directions of research: research of microorganisms and invertebrates vital to the agriculture; research of soil and earth resources; improvement of efficiency of plants and animals; environmentally friendly growing technologies; management of forest resources, ecology and research in silviculture; factors influencing forest ecosystem; food safety and risks (<https://www.llu.lv/index.php/en/research-fields>). The scientific activity is aimed at directions of fundamental and applied research. LLU Research Programme has several action plans defined: 1) development plan for human resources involved in research; 2) target cooperation development plan; 3) plan for participation in research and innovation development programmes and technology initiatives; 4) plan for increasing the number of international publications; 5) development plan for knowledge and technology management. The action plans promote the overall research activities of the LLU, including in the field of study, ceation of new scientific insights and transfer to the industry.

The defined priority research directions of biosciences correspond to the goals of study direction. Annual reports on scientific activity allow monitoring performance of defined indicators and achievements defined in the research. For example, the academic staff involved in implementation of study direction in academic year of 2019/2020 has been actively conducting scientific research and dissemination the obtained results, which is evidenced by the number of projects implemented (above 100), publications of different level (Scopus or Web of Science databases above 80, anonymously reviewed international scientific publications 47), one monograph and reports in national (58) and international conferences (100), and publications in industry journals (32).

Resources for research in study direction are sourced externally (international projects, Horizon 2020, INTERREG, ERA-NET, ERAF, EIP “Cooperation” projects, Grants of Latvian Council of Science, projects financed by the Ministry of Agriculture, contractual projects with entrepreneurs etc.) and use also internal programmes of LLU which are covered from LLU resources.

LLU has elaborated several support programmes:

1) *Strengthening of the scientific capacity in LLU*, goal of which is to promote development of

priority research directions defined in LLU Science Development Strategy and elaboration of relevant doctoral theses. 6 projects related to research directions were supported in the study direction in 2019.

2) *LLU research programme implementation*, which aims to ensure implementation of effective indicators put forth in the research directions approved in LLU strategy, and to promote engagement of graduate, postgraduate students and new scientists in scientific activity. 5 projects related to research directions were supported in the study direction in 2019.

3) *Fundamental research in LLU*, goal of which is to ensure fundamental research in Latvia University of Life Sciences and Technologies (LLU), thus creating new knowledge and technological insights in the research directions defined in LLU Development Strategy. 2 projects related to research direction were supported in the study direction in 2019.

Research projects in the study direction are elaborated also interdisciplinary, by involving researchers from several faculties, and also together with cooperation partners, for example, Latvian National Silviculture Institute "Silava", Horticulture Institute and other scientific institutes.

In general, active research is conducted generally in the study direction.

The scientific activity of academic staff is evaluated on an annual basis and depending on performance in terms of points a bonus is added to the basic salary. LLU has a system which provides sufficient financial resources for publishing scientific articles in journals included in Scopus or Web of Science databases. It is ensured by the science base funding granted to each faculty.

Two postgraduate programmes are implemented in the study direction: **Agriculture** and **Forest Science**. Both programmes are important for preparing the new scientists and approximately 21% of all doctoral students of LLU study in these postgraduate programmes. Building of scientific capacity of doctoral students in LLU is organised in the research directions defined in LLU Research Programme, which are unique and depend on topics of theses elaborated in other universities. The wide range of international scientific conferences offered by LLU (<https://www.llu.lv/en/scientific-conferences>) gives opportunity to the young scientists to publish their research results in quoted collections of conference papers. The doctoral students from postgraduate studies publish 12-15 publications on average in the study direction annually, and they are quoted in Scopus or Web of Science databases. Doctoral students with their thesis supervisors (both from LLU and cooperation institutions, and abroad) engage in the research projects. National research programme projects, Projects of Latvian Science Council and also international projects, within the framework of which the doctoral theses are elaborated or have been elaborated, are implemented in the reporting period. Of the total number of doctoral students who have elaborated their theses in the reporting period, approximately 24% work for LLU and pursue an academic career.

4.2. The relation between scientific research and/or artistic creation and the study process, including the description and assessment of the use of the outcomes in the study process.

Majority of the academic staff members is involved in delivery of **studies** and research therefore it is possible to integrate the latest scientific insights into **study process** thus promoting knowledge-based education. Coherence of the scientific research and study process is shown by engagement of students from all levels in project implementation, which results in elaboration of theses and doctoral theses.

Study materials were also prepared within the framework of research projects, for example, “*Working with microbial symbioses of legumes: handbook of protocols*” (<http://www.lf.llu.lv/sites/lf/files/2017-01/Eurolegume%20D3%201%20-%20Handbook%20of%20protocols.pdf>) prepared in FP7 project “EUROLEGUME”. Materials have been prepared in Erasmus+ programme’s project “Climate Changes in Agriculture” (CLICHA) to improve several courses. In project “Climate-friendly agriculture practice in Latvia”, with a support from the Ministry of Agriculture, materials about measures for restricting SEG emissions, which can be used in several courses of programme “Agriculture” (<https://www.llu.lv/index.php/en/climate-friendly-agriculture>) were prepared. A book “*Guidelines for soil description and classification central and Eastern European students’ version*” was published, and it was created within the framework of ERASMUS+ project FACES (*Freely Accessible Central European Soil*). A training module was elaborated within the framework of international project HARVESTHEAD (<http://www.innovawood.com>). Within the framework of national research programme “Dynamics of Latvian ecosystems under impact of climate” (EVIDEnT) a monograph “Possibilities to reduce greenhouse gas emissions through climate-friendly agriculture and forestry in Latvia” was published.

Some projects are elaborated in cooperation with the Latvian Rural Consultation Bureau, Ministry of Agriculture, and Food Safety, Animal Health and Environment Science Institute BIOR, Horticulture Institute. Cooperation entailed involvement of graduate students in elaboration of theses and publications. The elaborated theses are awarded in different competitions, for example, a Master Thesis “Evaluation of qualitative properties and antibacterial properties of quince seed oil” elaborated in the Horticulture Institute in 2019 under programme “Food Hygiene”, was awarded with Development Financial Institution ALTUM award, LLMZA and LLU certificate of recognition; ALTUM awards were given also in 2017 and 2018 to research “Analysis of milk cow longevity and milk production efficiency” and “Role of precision technologies in monitoring of milk cow productivity and herd regeneration indicators”. LZA New Scientists Award was granted in 2019 to the paper “Development of winter wheat leaf disease depending on fungicide spray schemes and nitrogen fertiliser norms”, which points at high scientific level of the graduate students’ research.

International and national patents have been registered in relation to individually implemented projects: WO 2019/229507 A1 “Pig feed additive for prophylaxis of antibiotic resistant *E.coli*” (05.12.2019.); WO2017010856 A1 “Composition for treatment of subclinical mastitis of cows” (19.01.2017); WO2015047064-A1 “Antibiotic free feed additive for piglets from Jerusalem artichoke, *Lactobacillus reuteri* and *Pediococcus pentosaceus*” (02.04.2015.); WO2015047063-A1 “Feed additive containing Jerusalem artichoke and *Pediococcus pentosaceus* for laying performance and egg quality” (02.04.2015.); LV15071B “Composition for treatment of subclinical mastitis for cows” (20.02.2016.); LV14772 “Composition containing prebiotic Jerusalem artichoke *Helianthus tuberosus* and probiotic *Pediococcus pentosaceus* for meat pigs” (20.02.2015); LV14773 “Use of Jerusalem artichoke powder and *Lactobacillus reuteri* additive for improving laying efficiency of broiler chicken” (20.02.2015); LV14882 A “A method for producing potato chips with reduced fat content” (20.07.2014); LV14631 A “Method for drying cranberries” (20.02.2013).

Every year LLU organises international scientific conference “Students on their Way to Science”, the Faculty of Agriculture organises scientific conference of graduate students and students “Diverse Agriculture” on a yearly basis. Both conferences allow students improving public presentation skills, an ability to discuss and provide arguments to questions.

The Forest Faculty engages in organisation of forest industry conferences together with cooperation partners LVMI “Silava”, AS “Latvian State Forests”, Forest Industry Competence Centre etc., with participation of LF academic staff and introducing the participants to the research results.

Every year LF organises two events: scientifically applied conference “Harmonious Agriculture” and

scientific seminar “Harvest festival in Vecauce” where university lecturers of the study direction present their reports and students are both participants and audience and can learn about the results of scientists’ research. Articles published in the collection of papers from both events can be used in studies when elaborating their thesis (<http://www.lf.ltu.lv/lv/lidzsvarota-lauksaimnieciba> and <http://www.lf.ltu.lv/lv/razas-svetki-vecauce>, in Latvian with abstracts in English).

Results of the scientific research or part thereof are presented also in annual event “European Researchers' Night”, which is aimed at getting acquainted with science achievements and work of scientists. Students from all levels are engaged in organising this event.

In general, the scientific research in study direction is comprehensively related to study process.

4.3. Description and assessment of the international cooperation in the field of scientific research and/or artistic creation by specifying any joint projects, researches, etc. Specify those study programmes, which benefit from this cooperation. Specify the future plans for the development of international cooperation in the field of scientific research and/or artistic creation.

The main activities in research of academic staff of the faculty involved in delivery of study direction, leading researchers and researchers:

- Participation in INTERREG projects (InnoFruit; Advanced manure standards for sustainable nutrient management and reduced emissions).
- Participation in FP7 and ERA-NET projects (CCCfarming; SusCrop project “LegumeGap” Increasing productivity and sustainability of European plant protein production by closing the grain legume yield gap; PigSys, InnoGrow, REFORM, ITApic u.c.).
- Participation in Latvia-Belarus cooperation project (*Pyrenophora tritici-repentis* development specifics and restriction possibilities in winter wheat fields in Latvia and Belarus).
- Participation in Swedish Institute and Baltic Sea cooperation project (Funding for multiplication of medicinal plants).
- Participation in COST events (FP1204 Green infrastructure approach: making a bridge between environmental and social aspects of urban forest research and management; CA16123 – “Safety Culture and Risk Management in Agriculture” (CA COST Action CA16123 Sacurima); CA18210 – Oxygen sensing a novel mean for biology and technology of fruit quality” (CA COST Action CA18210 RoxyCost).
- Participation in Horizon2020 and FP7 projects (4D4F, EUROLEGUME).
- Participation in ERASMUS+ (KA2) programme’s projects (CLICHA, Share your soil, [Free access Central European Soil Database](#)).

Academic staff engages and participates in different international organisations: The Nordic Association of Agricultural Scientists; International Union of Soil Sciences; World Association of Soil and Water Conservation; European Society for Agronomy; International society for horticulture science; European Federation of Animal Science; work group of Plant genetic resources under European cooperation programme Medicinal Plants and Herbs; European Association for Potato Research, International Association for food Protection, American Society for Microbiology etc.

The academic staff involved in delivery of study direction is: 1) engaged in the board of editors of international scientific journals (*Acta Agriculturae Scandinavica, Section B – Soil & Plant Science; Žemdirbyste-Agriculture; Agronomy Research, Research for Rural Development; Contemporary*

Horticultur; Baltic Forestry etc.); 2) experts in evaluation of national and international projects; 3) experts in international organisations or institutions.

Participation in international organisations, board of editors of scientific journals, various international projects and expert work helps promoting the research results, integration of scientific insights into the study courses of **all levels** (bachelor, master and doctoral) **study programs** inculcing in the study field, and involvement of students in the research projects, which leads to elaborated bachelor, master and doctoral theses, as well as informing the students on international level topicalities in a particular industry (research trends) and involvement of students in international events (organisation of project seminars, participation etc.). Different activities promote cooperation and experience exchange both for academic staff and students

Further international cooperation to develop scientific research is aimed at popularisation of science and research in international setting (ResearchGate, ORCID etc.) and national scale (by using www.sciencelatvia.lv); using internal LLU scholarships and doctoral scholarships to support young scientists; publishing of research results in high level scientific periodicals; better integration of science and research in the study process; wider use of new cooperation contacts for elaboration of new international projects.

4.4. Specify the way how the higher education institution/ college promotes the involvement of the teaching staff in scientific research and/or artistic creation. Provide the description and assessment of the activities carried out by the academic staff in the field of scientific research and/or artistic creation relevant to the study direction by providing examples and the summary of the quantitative data on the activities in the field of scientific research and/or artistic creation relevant to the study direction over the reporting period, for instance, the publications, participation in conferences, activities in the field of artistic creation, participation in projects by the academic staff members, etc., by listing the aforementioned according to the relevance.

Research work of the academic staff in majority of cases is related to specialisation, scientific interests of university lecturers, topicalities in agriculture, forestry and food hygiene fields of science, and approved priority scientific directions in LLU.

Engagement of academic staff in the scientific research takes place: 1) through informative events (seminars on delivery of particular programmes, announcements of particular research programme etc.); 2) invitations from cooperation partners (both in Latvia and abroad) to partake in projects; 3) via financial support from faculties' scientific base assigned to prepare publications, publishing in scientific journals and participation in conferences; 4) by organising various scientific events at the university and each faculty (incl. international), for example, international conferences *Research for Rural Development*, *Baltic Agronomy Forum*, seminars, etc.; 5) by building a cooperation with other universities, scientific institutes, non-governmental organisations (for example, preparing joint monographs, implementation of joint projects etc.); 6) by promoting acquisition of expert license from the Latvian Scientific Council (there are criteria defined to acquire LZP expert license).

University lecturers from the study direction prepare and publish articles in international journals indexed in databases, incl. Scopus and Web of Science; anonymously quoted scientific publications and collections of conference papers, elaborate text-books and methodological materials. For example, number of publications by the academic staff involved in delivery of doctoral programme Forest Science in Scopus database sources in the reporting period exceeds 262, incl. a considerable

portion of publications was prepared together with foreign researchers, within the framework of international cooperation by making their presence more visible in science development at broader scale. Publications were published in the largest part of most relevant scientific journals of forest industry, such as, *Agricultural and Forest Meteorology*, *Global Change Biology*, *Ecosphere*, *Canadian Journal of Forest Research*, *European Journal of Forest Research*, *Forest Ecology and Management*, *New Forests*, *Urban Forestry and Urban Greening*, *Silva Fennica*, *iForest*, *Forests*, *Forestry Studies*, *Baltic Forestry*. In postgraduate programme Agriculture, number of publications in the reporting period exceeds 220, and articles were published in journals such as *Agronomy Research*, *Acta Fytotechnica et Zootechnica*, *Acta Horticulturae*, *Advances in Agronomy*, *European Journal of Agronomy*, *Canadian Journal of Plant Pathology*, *Photosynthetica*, *Agriculture*, *Acta Agriculturae Scandinavica, Section B - Soil & Plant Science* etc.

Academic staff actively participates in local conferences and applied industry seminars (and organise them), international scientific conferences, congresses, symposiums in Latvia and abroad, both with oral and booth papers, for example in international conference *Sustainable management of natural resources - Baltic Sea region as the driving force*, annual international scientific conference *Research for Rural Development*, international multidisciplinary scientific *GeoConference* SGEM, IUFRO congress, World Latvian Scientists congress etc.

During the reporting period, the academic staff was involved in numerous scientific research activities as project and programme participants or hosts: international projects (FP7, ERA-NET, Interreg, Latvia-Belarus transborder projects etc.); National research programmes, Latvian Science Council scholarships, EIP "Cooperation" projects (16.1, 16.2.); projects funded by the Ministry of Agriculture, knowledge transfer and information events funded by ELFLA and administered by Rural Support Service (Events to ensure demonstrations); LLU internal projects. The new doctors can also compete for the financing granted to postgraduate research support projects (currently 1 new doctor, MF), providing a possibility for the new scientists to start a career and to develop their competences and add to the number of qualified specialists.

Projects are implemented through cooperation among several academic staff members of LLU faculties, LLU cooperation partners (Horticulture Institute, Institute of Agricultural and Economics), Latvian State Forest Research Institute Silava (LVMI "Silava"), AS Latvian State Forests, BIOR and other scientific institutes from agriculture, forest and food science companies in Latvia.

LLU has a system and criteria elaborated to receive funding depending on the scientific activity of each scientists, as well as principles elaborated for using the financial resources of each faculty's science base in order to promote preparation of high-level publications. In order to increase the scientific capacity of LLU and promote involvement of new scientists, there are three internal scholarship programmes in place (see Section 2.4.1).

In general, the academic staff which is involved in delivery of study direction is highly engaged in the scientific research. For scientific publications, participation in conferences and projects refer to Annexes.

4.5. Specify how the involvement of the students in scientific research and/or artistic creation activities is promoted. Provide the assessment and description of the involvement of the students of all-level study programmes in the relevant study direction in scientific research and/or artistic creation activities by giving examples of the opportunities offered to and used by the students.

Student engagement in the scientific research is an integral part of study process and an important for elevating the research capacity in study direction. Engagement mechanism:

- students of all levels elaborate their theses based on trials, experiments or research in relevant research direction or on topical issues in the industry;
- research results are presented in conferences of various scale: international student conference “*Students on their Way to Science*” (presenting their oral report), student and graduate student conferences organised by faculties (presenting their oral report);
- publishing of research results in collections of previously mentioned conference summaries or other conferences;
- participating in conferences organised by the faculties or other conferences as a participant or visitor;
- When undergraduate students from the Faculty of Agriculture participate in scholarship competition offered by SIA Rīgas Dzirnavnieks for elaboration of research or traineeship (https://www.llu.lv/lv/stipendijas/attistibas-fonda-stipendijas/as-rigas-dzirnavnieks-stipendija_in_Latvian);
- Graduate students from the Faculty of Agriculture and Forest Faculty participate in scholarship competition offered by Latvian Agriculture Cooperatives Association which aims at promoting targeted scientific and research activities (https://www.llu.lv/lv/stipendijas/attistibas-fonda-stipendijas/latvijas-lauksaimniecibas-kooperativu-asociacijas_in_Latvian).

Student engagement in science takes place through work in the scientific projects in a capacity of scientific assistant or laboratory technician. For example, of 101 projects implemented in the study direction in academic year of 2019/2020, students were engaged in 47 projects. Theses (of all levels) are elaborated and successfully defended on the project’s basis; they contain references to a specific project. Over last two years, MEK graduate programme Agriculture has especially noted the high scientific level of Master theses and ability of graduate students to elaborate their theses within the framework of scientific projects.

The academic staff of the study direction can use LLU internal scholarship programmes “Strengthening of Scientific Capacity in LLU” and “Implementation of LLU research programme”, goal of which is to promote engagement of graduate students and young scientists in the scientific activity. 11 doctoral students and supervisors of their theses were engaged in these programmes in the reporting period.

Doctoral theses in postgraduate programme Forest Science were elaborated within the framework of a research in 80% of cases on average in the reporting period; this opportunity was used the most in LVMI “Silava” and LLU Memorandum on cooperation in Latvian forest industry within the framework of higher education and forest science development. Possibilities to participate in research are being searched for as soon as the applicant shows interest in studies, evaluating suitable topics and time (also funding) for research of these topics. The academic staff, when preparing the project applications, provides a room for doctoral student engagement and in case of winning a competition a suitable candidate is invited to register for doctoral studies or develop the intended research direction there. An example of such practice is involvement of a doctoral student in LZP scholarship “Decreasing risks of storm damage when managing the private forests” (2018–2020), and involvement of two doctoral students in LZP scholarship “Pathogenicity and diversity of significant legume disease trigger *Botrytis* spp.”.

Practically all doctoral theses or part of them are elaborated in the confines of scientific projects.

4.6. Provide a brief description and assessment of the forms of innovation (for instance, product, process, marketing, and organisational innovation) generally used in the study direction subject to the assessment, by giving the respective examples and assessing their impact on the study process.

LLU employs various solutions in its activities to promote efficiency, improve study quality and improve competitiveness.

In order to attract and inform students, LLU uses a wide set of marketing tools suitable for modern communication (microblogging platforms, various social networks, photo and video sharing app, youtube etc.). Websites of LLU, faculties and structural units have been updated and improved (uniform style alleviates information search); digital media predominate in promotional activities.

Organisation of e-studies in the reporting period improved – video lectures (BBB or edumeet) were used, and they can be recorded. During online classes students can present the assignments, participate in seminars, discussions and group works, submit the assignments, take examinations or tests by using electronic tools, create vocabularies and databases. Course descriptions, necessary materials, self-assessment questions, auxiliary materials (various format) are available in e-studies, it is possible to create assessment book so that the students can follow-up their progress. Different free of charge tools can be used for studies to conduct quick surveys and tests. Instructions and tips for using e-studies platform are given there.

LLU has its information system (LLU IS) – a database of students and academic staff. This system allows digitalising several processes and process documents (references, orders, study agreement with any amendments to it, preparing diplomas, gathering statistical data etc.). LLU IS is integrated into electronic environment and personal data review, which provides students with information about the study progress, financial situation, obtained credits, application for free electives, evaluation of academic staff members, uploading of theses etc.; the academic staff members can see their publications, list of lessons, student lists, review theses etc.

In order to improve the efficiency of work, LLU has provided electronic enrolment for studies, document management system DVS Namejs was introduced since 2018, which ensures management of correspondence, orders, agreements, references, procurement documents and automation of document circulation.

LLU students, university lecturers and administrative staff already have access to a well-developed IT infrastructure and e-studies platform, however the innovative solutions which ensure study process requires constant improvements which are managed by LLU management and structural units involved.

Different innovative solutions are used for course delivery (both results of projects and cooperation partner offers or projects), which improve the quality of study content and allows the students to create their product (for example, different decision-making support systems (eAgronom, LVM GEO etc.) are used in study process)).

II - Description of the Study Direction (5. Cooperation and Internationalisation)

5.1. Provide the assessment as to how the cooperation with different institutions from

Latvia and abroad (higher education institutions/ colleges, employers, employers' organisations, municipalities, non-governmental organisations, scientific institutes, etc.) within the study direction contributes to the achievement of the aims and learning outcomes of the study direction. Specify the criteria by which the cooperation partners suitable for the study direction and the relevant study programmes are selected and how the cooperation is organised by describing the cooperation with employers. In addition, specify the mechanism for the attraction of the employers.

Cooperation in the study direction involves public and non-governmental organisations of Latvia, industry companies, professional associations, higher education institutions etc.

Cooperation is planned and organised depending on desirable cooperation results and partner's reputation. The main cooperation types and directions are:

- Cooperation with employers: involvement of visiting lecturers, participation in national graduate students' examination commission (it is defined by applicable laws and regulations); provision of traineeship places; study excursion visits (e.g. AS Balticovo; LPKS LATRAPs); organisation of joint events; scholarship competitions (SIA Rīgas dzirnavnieks);
- Cooperation with other scientific institutions: provision of traineeship places, elaboration of theses, implementation of research projects, delivery of training courses (e.g., BIOR, AREI, AS LVM, LVMI Silava, LLKC etc.);
- Cooperation with professional organisations: organisation of shared events (LVMI Silava, AS LVM, Latvian Sheep Breeders Association etc.), scholarship competitions (for example, Latvian Agronomists Society, Latvian Agriculture Cooperatives Association); participation in programme evaluation (for example, cooperation council of Agriculturist Organisation);
- Participation in councils of non-governmental organisations and other institutions (for example, National Botany Garden, Latvian Forest Certification Council, Scientific Union of Latvian Clay);
- Research based on contracts with employers, non-governmental organisations (for example, SIA Earth Revival, Latvian Waste Association); use of direct data management software in study process (for example, eAgronom);
- Work in doctoral councils of other universities (for example, Geography, Geology and Environmental Science doctoral council in LU, Biology Science professor council in LU), and foreign councils, such as Lithuanian Agriculture and Silviculture research centre, Vytautas Magnus University;
- Cooperation with other education establishments to ensure succession of education programmes, materially technical base, LLU intellectual potential (for example, Ogre Technical School, Bulduri Horticulture Secondary School).

LLU Internationalisation plan was elaborated in 2015, it defines university's international cooperation goals, priorities and performance indicators in exchange studies, full-time foreign students and foreigner students' living situation aspects. The elaborated plan defines priorities and intends:

- cooperation with higher education institutions with similar study and scientific profile in EU Member States and partnering states where study directions correspond to those delivered in LLU;
- cooperation with international associations of universities where LLU participate actively: Association for European Life Science Universities (ICA), Baltic University Programme (BUP), Network of Baltic and Nordic Agriculture Universities (BOVA - NOVA), Nordic Association of

Agricultural Science (NJF) etc. and which conduct their academic activities in similar study and research directions.

Since the international cooperation offer from foreign universities is wide, LLU focuses its activities on partners who are involved in this cooperation for a long-term and efficiently. Also, at level of LLU study directions, foreign partnering universities or their faculties where regular student and university lecturers exchange take place (Erasmus+ programme etc.), participation in joint projects both as studies (for example, SAM 8.2.3) and research, mutual participation in scientific and methodological conferences etc.

A list of higher education institutions with which Erasmus+ interinstitutional agreements are signed are available at: https://www.llu.lv/sites/default/files/2018-10/LLU%20ligumi%20_Erasmus%2B%20partneraugstskolas_HEIs%2027.03.18.xls

Cooperation with various organizations and companies in the field is closely related to the main goal of the study direction - quality studies, which are implemented through lectures, internships, study visits, material, technical and consultative support both in the study process and in the development of final theses (especially in bachelor level).

Cooperation with foreign institutions and universities promotes the use of international project results in higher level study program study courses, exchange of experience in scientific work, thus ensuring the achievement of study program goals (to prepare high quality specialists in the field, science or pedagogical work).

Information about cooperation agreements can be found in Annex 10.

5.2. Specify the system or mechanisms, which are used to attract the students and the teaching staff from abroad and provide a description of the dynamics of the number of the attracted students and the teaching staff.

In order to draw foreign students' interest in LLU, firstly information must be provided about their offer, which can be found on websites (see section **Availability of information on study direction**). LLU employs various marketing activities to attract foreign students: agreements are signed with recruitment agents, intending an evaluation of their work efficiency, e-marketing, participation in international education fairs and agent forums etc. LLU is a member of Latvian Association of Higher Education Experts (AIEA) and partakes in the activities organised by it.

Foreign students do not study yet in the programmes of this study direction, because 8 of 10 programmes are delivered in Latvian. 6 applicants showed interest in studying in Sustainable Forestry and Sustainable Agriculture programmes, however due to various reasons, including COVID-19 pandemic restrictions, they did not start studying.

In the reporting period, 3 university lecturers from Finland (Helsinki University), Denmark (Aarhus University) and Lithuania (Alexander Stulginsk University) were invited to deliver graduate study programme, 2 university lecturers from Poland (Warsaw University of Life Sciences), one from Estonia (Tartu University of Life Sciences) and Sweden (Uppsala University) delivered lectures and classes in the Bachelor's study programme Agriculture.

No foreign academic staff members were involved in graduate programme "Food Hygiene" since 2014. The programme is delivered in Latvian, therefore foreign students did not apply. It is planned to offer graduate programme "Food Hygiene" also to foreign students as of 2023.

In the reporting period, the academic staff members were involved as visiting university lecturers by means of ERASMUS+ mobility programme. 90 visiting university lecturers in total lectured in the study direction and experience exchange opportunity was taken by 6 academic staff members from cooperation universities (Sect. 2.3.6.) in the reporting period.

In future a larger number of foreign university lecturers are expected to be invited, which is also stated in LLU Development Strategy, at the same time solving the issue of attracting funds for salary.

5.3. In the event that the study programme entails a traineeship, provide a description of the traineeship options offered to the students, as well as the provision, and work organisation. Specify whether the higher education institution/ college provides assistance in finding traineeships.

Traineeship is organised according to LLU Traineeship Regulation (<https://www.llu.lv/lv/studiju-prakses>, Latvian only). There are several traineeships in programmes: study traineeship, professional traineeship and research traineeship. Traineeships are organised under the lead of academic staff members according to study plan. Students are assigned to the professional traineeship, according to the study plan, on the basis of trilateral agreement on study traineeship.

A student chooses traineeship provider independently, taking into account traineeship requirements and harmonising them with the traineeship supervisor. Traineeship supervisors (coordinators), programme directors help in a search for traineeship places; thesis supervisor or university lecturers can recommend traineeship providers. Faculties receive traineeship offers from long-standing cooperation partners and other industry companies every year.

Information about traineeship places is available to students in the faculties on the information board, it is sent to seniors of groups and courses to their e-mails and also in course's group email. Students are informed about the offered traineeship places also by Vice-dean or programme director. Traineeship offer is available also on LLU website, Work and Traineeship Offers section (https://www.llu.lv/lv/darba_piedavajumi/view_practice, Latvian only and <https://www.llu.lv/en/job-offers>).

A student undergoing a professional traineeship has two supervisors: one from the relevant institute/department of the faculty and other from the traineeship.

Students can undergo traineeship in foreign companies. In this case, a student can do one of the following:

- when entering in trilateral agreement prepared in English (see the link above), in this case a dean's order is prepared;
- if a traineeship takes place in confines of ERASMUS+ programme, documentation and rector's order of students heading for a traineeship is prepared by LLU International Cooperation Centre (SSC). Students can join the exchange programme during studies and within a year after the graduation (one student has taken this opportunity in this study direction).

When attending the traineeship within the framework of ERASMUS+ exchange programme, a student searches for a traineeship provider independently, nevertheless traineeship supervisor,

programme director or other university lecturer may help. LLU SC also informs about the traineeship places offered by foreign companies, and students get this information from programme director or faculty's management.

A student can change traineeship provider, and in this case a person in charge of the faculty prepares a new dean's order on the basis of student's application on change of the traineeship. Traineeship supervisor prepares a new traineeship contract.

During the traineeship a student prepares a traineeship report according to traineeship programme, meets all the requirements stated in the programme and submits it together with the traineeship report and a recommendation from the traineeship provider to the traineeship supervisor. Public defense and evaluation of the traineeship takes place in a commission approved by the dean.

Research traineeship of graduate students is headed by the programme director who agrees with a graduate student on traineeship place, an order is prepared and trilateral agreement is signed among LLU, graduate student and traineeship provider. Traineeship places in programme "Food Hygiene" were basically ensured by Food and Veterinary Service (PVD), offering students a traineeship in one of regional departments of PVD. Graduate students can choose traineeship providers themselves according to the requirements stated in the traineeship programme.

Traineeship agreements have been signed on traineeship possibilities and cooperation (see Annex 13). For Traineeship Regulation, information about traineeship agreement refer in annex "Traineeship regulation".

5.4. In the event that joint study programmes are implemented in the study direction, provide the justification of the creation of the joint study programmes and a description and assessment of the selection of the partnering higher education institutions by including information on the principles and the procedures for the creation and implementation of these joint study programmes. In the event that no joint study programmes are implemented in the study direction, provide a description and assessment of the plans of the higher education institution/ college for the creation of such study programmes within the study direction.

(Not applicable)

II - Description of the Study Direction (6. Implementation of the Recommendations Received During the Previous Assessment Procedures)

6.1. Assessment of the fulfilment of the plan regarding the implementation of the recommendations provided by the experts during the previous accreditation of the study direction, as well as the assessment of the impact of the given recommendations on the study quality or the improvement of the study process within the study direction and the relevant study programmes.

International evaluation of study direction and programmes included in it was done in 2012, and at that time 15 programmes were included in the study direction (6 undergraduate (including Veterinary Medicine), 6 graduate, 3 postgraduate programmes).

Main reprimands from the experts were related to closure or consolidation of several programmes, financing, staff development, professional development and improvement of foreign language skills, improving of these's quality, student attracting to one programme.

During previous accreditation of the study direction, majority of recommendations provided by experts were implemented or actions plans were elaborated to perform them, ensuring both development of study direction and programmes contained in it, consolidation and improvement of study quality. For example, in the framework of various projects implemented at the university, the academic staff has improved the English language skills that are necessary for working with ERASMUS+ students and will be needed for working with students in the new study programs. The teaching staff has 100 to 200 hours of internships in the companies of the branch, thus improving both the content of the study courses and closer cooperation with the companies (potential internships). The involvement of doctoral students in the study process is a step towards changing the generation of academic staff, which is still not happening to a sufficient extent. The opportunity provided by the projects to attract foreign academic staff also increases the quality of studies, but is still insufficient.

A report on the implementation of the recommendations is attached in Annex 14.

The recommendations were taken into consideration and hence there are 10 programmes in the study direction: 5 undergraduate programmes (Veterinary Medicine is not included, and 2 will be delivered in English), 3 graduate programmes and 2 postgraduate programmes.

Improvement of programmes included in the study direction are promoted also by recommendations of Latvian and foreign experts involved in project 8.2.3. "Improvement of LLU Management" to improve programmes.

6.2. Implementation of the recommendations given by the experts during the evaluation of the changes to the relevant study programmes in the respective study direction or licensed study programmes over the reporting period or recommendations received during the procedure for the inclusion of the study programme in the accreditation form of the study direction (if applicable).

Two academic Bachelor's study programmes were licensed in the direction during the reporting period. *Sustainable forestry* and *Sustainable agriculture*.

Experts' recommendations in academic Bachelor's study programme **Sustainable Agriculture** are being implemented according to a plan: course mapping is reviewed and supplemented in some course programmes; some bibliography sources are improved in some course programmes; more than 20 courses have study materials prepared in English, they are available in LLU e-studies platform; 10 of academic staff members involved in programme delivery have improved their English skills.

When licensing the academic Bachelor's study programme **Sustainable Forestry**, experts recommended to briefly eliminate shortcomings in course descriptions. This recommendation has been implemented and, when reviewing course programmes, 30 of them were improved. The updated course programmes are available in LLU IS Course Register.

There was a need for a short-term solution to "*include in the study agreement a clause stating that University guarantees a compensation for loss to students if the study programme is not accredited*

due to university's conduct (act or omission) or a licence of study programme is abolished and the student does not want to study in another programme". A discussion on the possible inclusion of such a clause in the study agreements took place at the meeting of the Study Council of the Latvia University of Agriculture on April 29, 2020 and it was decided that the study agreement will not include a sentence on compensation of students. LLU confirms that each such case will be considered individually and students will be refunded the paid tuition fee, if such a case does occur.

From a long-term perspective the experts recommended to improve student feedback mechanism. This recommendation was implemented in 3 steps, which includes LLU internal regulatory document on review and updating of student surveys, and this study feedback is taken into account in the academic staff motivation system, which makes them more interested in student involvement in evaluation. LLU reviewed mandatoriness of surveys (subject to sanctions) and concluded that it would not encourage impartial evaluation from the students. Implementation of recommendations given by licensing experts goes according to the plan.

Recommendation implementation plan regarding programmes *Sustainable forestry* and *Sustainable agriculture* are added in annex 15

Annexes

I. Information on the Higher Education Institution/ College		
List of the governing regulatory enactments and regulations of the higher education institution/ college	1_dala_1_pielikums_EN_Main internal legal acts and regulations.docx	1_dala_1_pielikums_Galveno_normativo_dokumentu_saraksts.docx
Information on the implementation of the study direction in the branches of the higher education institution/ college (if applicable)		
Management structure of the higher education institution/ college	2_Annex_LLU_management_structure_EN.docx	2_Pielikums_LLU_parvaldibas_shema_LV.docx
II. Description of the Study Direction - 1. Management of the Study Direction		
Plan for the development of the study direction (if applicable)	3_pielik_Development-plan-of-study-direction.pdf	3_pielik_Studiju_virziena-attistibas-plans_Lv.pdf
Management structure of the study direction	4_annex_Management of the study direction_EN.pdf	4_pielik_Studiju_virziena_parvaldiba_LV.pdf
II. Description of the Study Direction - 3. Resources and Provision of the Study Direction		
Basic information on the teaching staff involved in the implementation of the study direction	6_pielik_Virziena-iesaistitie-macibspeki_Acad-staff_Lv_en_prec.xlsx	6_pielik_Virziena-iesaistitie-macibspeki_Acad-staff_Lv_en_prec.xlsx
Biographies of the teaching staff members (in Europass Curriculum Vitae format)	Academic-staff_CV_english.rar	Macibspeku_CV_latviski.rar
Summary of the statistical data on the incoming and outgoing mobility of the teaching staff over the reporting period	8_pielik_Annex_8_Macibsp-mobilitate_Acad-staff_Mobility_Lv-en_prec.pdf	8_pielik_Annex_8_Macibsp-mobilitate_Acad-staff_Mobility_Lv-en_prec.pdf
II. Description of the Study Direction - 4. Scientific Research and Artistic Creation		
List of the publications, patents, and artistic creations of the teaching staff over the reporting period	9_pielik_Macibspeku-publikaciju-saraksts_List-of-publication_Lv-en.pdf	9_pielik_Macibspeku-publikaciju-saraksts_List-of-publication_Lv-en.pdf
II. Description of the Study Direction - 5. Cooperation and Internationalisation		
List of cooperation agreements	10_pielik_Cooperation_contracts_en.pdf	10_pielik_Sadarbibas-ligumi.pdf
Statistical data on the teaching staff and the students from abroad	11_pielik_Statist-dati-par-arvalstu-stud-un-macibsp_Statistical-data-foreign-student-acad-staff_Lv_en_prec.pdf	11_pielik_Statist-dati-par-arvalstu-stud-un-macibsp_Statistical-data-foreign-student-acad-staff_Lv_en_prec.pdf
Statistical data on the mobility of students (by specifying the study programmes)	12_pielik_Annex12_Studejoso_mobilitate_Students_Mobility_Lv-en.pdf	12_pielik_Annex12_Studejoso_mobilitate_Students_Mobility_Lv-en.pdf
Description of the organisation of the traineeship of the students	Traineeship_regulation_2014_2018_LV_EN.pdf	Praksu_nolikums_ar_2014_2018-1.pdf
Information on the agreements and other documents confirming the traineeship of the students in companies	13_pielik_Contract_internship_en_preciz.pdf	13_pielik_Ligumi_prakses_Lv.pdf
II. Description of the Study Direction - 6. Implementation of the Recommendations Received During the Previous Assessment Procedures		
Overview of the implementation of the provided recommendations	14_pielik_Implementation of recommendations_en_prec.pdf	14_pielik_Rekomendaciju-izpildes-plans_prec.pdf
Description of the Study Programme - Other mandatory attachments		
Confirmation signed by the rector, director or the head of the study programme or the study direction of the higher education institution/ college which states that the official language proficiency of the teaching staff involved in the implementation of the relevant study programmes of the study direction complies with the regulations on the level of the official language knowledge and the procedures for testing official language proficiency for performing professional duties and office duties.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period		
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard		1_pielik_Atbilstiba-valsts-izglitiba-standartam_Ls-bak_LV_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)	2_annex_Compliance-with-profess-stand_Ls_bak_EN_prec.pdf	2_pielik_Atbilstiba-profesijas-standartam_Ls_bak_LV_prec.pdf
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme		
Curriculum of the study programme (for each type and form of the implementation of the study programme)		
Descriptions of the study courses/ modules		Studiju kursu apraksti LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.		
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued		2pielik_Stud_kursu_plans_kartejums_Mapping_Mezz-PhD-3.xlsx
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme		
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education		
Sample (or samples) of the study agreement		
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education		
Description of the Study Direction - Other mandatory attachments		
Electronically signed application form for assessment of a study direction	Iesniegums_studiju_virzienam_Lauksaimnieciba_novertesana_EN_change.docx	Iesniegums_studiju_virzienam_Lauksaimnieciba_novertesana_precizets.edoc

Other annexes

Name of document	Document
LLU Dokumenti latviešu valodā	LLU Dokumenti latviešu valoda.zip
LLU Documents in English	LLU Documents in English.zip
5_pielik_SVID-analize.pdf	5_pielik_SVID-analize.pdf
5_annex_SWOT analysis.pdf	5_annex_SWOT analysis.pdf
14_pielik_Rekomendaciju-izpildes-plans.pdf	14_pielik_Rekomendaciju-izpildes-plans.pdf
14_pielik_Implementation of recommendations_en.pdf	14_pielik_Implementation of recommendations_en.pdf
15_pielik_Rekomendaciju-ieviesanas-plans_SA_SF.pdf	15_pielik_Rekomendaciju-ieviesanas-plans_SA_SF.pdf
15_pielik_Implementation-plans_SA_SF_en.pdf	15_pielik_Implementation-plans_SA_SF_en.pdf
_Precizejumi_zinojumam_Lauks-mezsaimn-par-hig_papild.pdf	_Precizejumi_zinojumam_Lauks-mezsaimn-par-hig_papild.pdf
PārZ6009 Ģenētiski modificētā pārtika.pdf	PārZ6009 Ģenētiski modificētā pārtika.pdf
AIP izziņa Nr_40_LLU CE.docx	Nr_40_LLU CE.docx
AIP izziņa Nr_40_LLU CE.edoc	Nr_40_LLU CE.edoc
AIP izziņa Nr_41_lēmuma pielikums_nr1_Mag_SP_Studiju_Padomes lem.pdf	Nr_41_lēmuma pielikums_nr1_Mag_SP_Studiju_Padomes lem.pdf
AIP izziņa Nr_41_LLU pap pras.edoc	Nr_41_LLU pap pras.edoc
LIC Ekspertu kopīgais atzinums_LU_IIV_gala_140617_ar parakstiem.pdf	Ekspertu kopīgais atzinums_LU_IIV_gala_140617_ar parakstiem.pdf
LIC ekspertu ziņojums_LLU BSP Ilgtspējīga lauksaimniecība_gala_2_170220-1.pdf	ekspertu ziņojums_LLU BSP Ilgtspējīga lauksaimniecība_gala_2_170220-1.pdf
LIC GALA_Atzinums_Ilgtspējīga_mezsaimniecība.pdf	GALA_Atzinums_Ilgtspējīga_mezsaimniecība.pdf
Akreditācija 2013 LLU.pdf	LLU.pdf

Forest Science (45623)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Forest Science</i>
Education classification code	<i>45623</i>
Type of the study programme	<i>Academic master study programme</i>
Name of the study programme director	<i>Olga</i>
Surname of the study programme director	<i>Miezīte</i>
E-mail of the study programme director	<i>olga.miezite@llu.lv</i>
Title of the study programme director	<i>Dr. silv.</i>
Phone of the study programme director	
Goal of the study programme	<i>To prepare highly qualified specialists for the scientific, pedagogic as well as professional and leading work, who are knowledgeable in the scientific research and competent in solving scientific and practical problems related to forest ecology and silviculture, forest works and technique, forest economy and policy.</i>
Tasks of the study programme	<i>The main task of the programme is to effect application of students' theoretical knowledge, cognition and research skills in solving silviculture-related issues. Specialists like this are very demanded in the labour market, because a well-elaborated and substantiated natural resource management, which is the basic task of the specialists in this industry, is central to ensuring sustainable and balanced development of Latvia.</i>

Results of the study programme	<p><i>Can demonstrate deeper or broader knowledge and understanding, corresponding to the latest discoveries of the forest science or professional sector, giving a room for creative mind-set or research, including when working in field where silviculture and forest ecology or forest work and technique or forest economy and policy come together.</i></p> <p><i>Can apply theory, methods and problem-solving skills independently to conduct scientific work or highly qualified professional functions in silviculture and forest ecology, or in forest works and technique, or forest economy and policy. Can explain and discuss complex or systematic aspects of forest science industry or professional sector both with experts and lay persons. Can guide competence development and specialisation independently, take responsibility for staff groups' results and their analysis, run business, innovations in forest science industry or profession, work, conduct research and pursue further learning in complicated and unpredictable circumstances and to change them, if necessary, through new approaches.</i></p> <p><i>Can competently and individually formulate and critically analyse complicated scientific and professional problems in a particular company or country in general: in silviculture and forest ecology or forest work and technique, or forest economy and policy, to substantiate decisions and perform additional analysis, if necessary. Can integrate knowledge from various fields, contribute to generation of new knowledge, development of research or professional methods, demonstrate understanding and ethical responsibility about research outcome in forest science or possible environmental and social impact of the professional activity. Can explain and discuss complex or systematic aspects of the forest science or professional sector both with experts and lay persons.</i></p>
Final examination upon the completion of the study programme	<i>Master Thesis</i>

Study programme forms

Full time studies - 2 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>2</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>80</i>
Admission requirements (in English)	<i>Bachelor's degree or second level professional higher education in forestry science, materials science, agricultural science, biology, environmental science, geography, computer science, management science, economics, transport and traffic specialties</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Master Degree of Agricultural Sciences in Forest Sciences</i>
Qualification to be obtained (in english)	<i>-</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Full time studies - 2 years - english

Study type and form	<i>Full time studies</i>
Duration in full years	2
Duration in month	0
Language	<i>english</i>
Amount (CP)	80
Admission requirements (in English)	<i>Bachelor's degree or second level professional higher education in forestry science, materials science, agricultural science, biology, environmental science, geography, computer science, management science, economics, transport and traffic specialties. At least B2 level of English language skills</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Master Degree of Agricultural Sciences in Forest Sciences</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Mission of the academic higher education Master's study programme "Forest Science" is to prepare highly qualified specialists for forest industry and education.

Academic Master programme (Annex 1) is aimed at mastering in-depth special knowledge in forest ecology and silviculture or forest works and technique, or forest economy and policy, and reciprocal integration of these fields in the scientific research.

Parameters of the programme have changed since the last accreditation, because, following the experts' recommendations, a new academic Master' study programme "Forest Science" has been elaborated and it merges three Master's study programmes (*Forest Ecology and Silviculture, Forest Works and Technique, Forest Economy and Policy*). Instead, three specialisation directions were created in the academic Master's study programme "Forest Science", namely Forest Ecology and Silviculture, Forest Works and Technique, and Forest Economy and Policy.

The new academic Master's study programme was launched in the academic year of 2017/2018. Changes have been introduced since the implementation of the programme by improving the courses.

In the second section "*Elective Courses*" a special course Principles of Forest Science at volume of 4 credits, which was a compulsory course until 2019/2020 for master students who have not graduated from LLU MF "Forest Sciences" or "Forest Engineers" basic study programme, was introduced. Meanwhile students, who have graduated from LLU MF "Forest Sciences" or "Forest Engineers" basic programme, at the same time acquired course "Silviculture" at deeper level. Following the survey of MA students, changes were introduced to the study programme and since the academic year of 2020/2021 both of these study courses, each at volume of 2 credits, are acquired by all master students. Alumni of the basic programme "Forest Sciences" or "Forest Engineers" operate as moderators of the course "Principles of Forest Science".

For the MA students to elaborate their theses at a better quality, changes were made to the master programme "Forest Science" in 2021. The theses of the master students will be evaluated in a 10-point system and Master Examination Commission will make a decision on whether to confer a Master's degree to the applicant (Resolution No. 1/1 of 12.01.2021 adopted by LLU Forest Faculty Council).

Following the programme approbation, it was concluded that the breakdown of MA students across specialisation directions differ greatly; as especially small number of applicants want to study in the Forest Work and Machinery (Annex 2) direction the students will not be admitted (Resolution No. 1/2 of 09.02.20201 adopted by LLU Forest Faculty Council) as of the academic year of 2021/2022.

Academic Master's study programme is being reviewed constantly, content is being improved not only in light of re-accreditation requirements, but also following the recommendations from the leading forest industry establishments, their employees and MA students.

Alumni from various universities and specialities can study in the academic Master's study programme "Forest Science" if relevant admission requirements for master programme, such as sufficient preliminary knowledge for successful acquisition of Master's study programme, are met. In order to study in the academic Master's study programme "Forest Science" a student needs to have certain educational background: Bachelor's degree or second level professional higher education in Forest Science, Material Science, Agriculture Science, Biology, Environment Science, Geography, Computer Science, Management Science, Economy, Transport and Traffic Industry sectors. Alumni of the basic programme "Forest Science", "Forest Engineer" receive 2 additional points in the competition. Certain requirements for admission in the programme and granting of additional points can be found in the Study Council Resolution *Additional Admission Requirements for Higher Level Programmes* (see, <https://www.llu.lv/en>) section *Master Studies* - Study Council Resolution No.2.4.-13/7 of 25.09.2019 *On Additional Conditions for Admission Requirements in the Higher-Level Studies for Academic Year of 2020/2021*.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

In LLU Forest Faculty one can acquire knowledge and get a Master's Degree in Forest Science. The number of students admitted (Annex 2) by years (28-31, including women 45-54%) does not change significantly. The number of students in the 2nd year of studies rapidly fall if compared to those in the first year. Dynamics of student numbers is affected by:

- failure to comply with student agreement obligations;
- failure to comply with financial obligations;
- failure to comply with study programme;
- failure to start studies;
- unsuccessful passing of final examinations;
- discontinuation of studies at own will, if the work cannot be joined with studies.

Students have two workdays of classes (mainly on Thursday and Friday). In order to reduce the dynamics of changes in student numbers between the 1st and 2nd study year and to comply with student requirements, it was decided to organise studies on Fridays and Saturdays as of 1 September 2020. Regardless of this, number of students goes down also due to existing situation with Covid-19 restrictions, because students cannot balance distant work with studies, and there are also various family problems affecting the dynamics of student numbers. In academic year of 2017/2018, student dropout was 17.8%, in academic year of 2018/2019 and in 2019/2020 it was 35.1 % (Annex 3).

Procedure for starting the studies in later study phases is determined with the Rector's Resolution No. 4.3-8/67 of 05.09.2018. Procedure of the resolution was elaborated in compliance with Article 47 of the Law on Higher Education Institutions, LR Cabinet of Ministers Regulation No. 932 of 16.11.2004 Procedure of starting studies in later study phases. Two students of the Forest Faculty discontinued studies and restarted studies later: one of them in academic year of 2019/2020 and 2020/2021. (Annex 3).

Full-time studies in "Forest Science" is covered from the state budget. Number of budget places, if compared across years, vary between 16 to 18% (Annex 3). MA students have study and student

credits available. If a student studies for a fee, he or she must pay for studies according to the requirements laid down by LLU Senate. Fee amount is linked to socioeconomic situation in the state. Therefore, it is reviewed and adjusted on a regular basis to comply with all legislative documents. *Education Council resolutions and Rector's decrees, concerning a particular study year, Senate Resolution No. 10-40 of 09.10.2019 Latvian University of Agriculture Admission Requirements for Higher-Level Studies in Academic Year of 2020/2021, Senate Resolution No. 9-106 of 11.11.2017 On Alleviations of Study Fee for Students with Good Achievements.*

Instruction language for academic Master's study programme is Latvian and English. So far students applied for studies only in Latvian.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Goal of the academic Master's study programme "Forest Science" is to prepare highly qualified specialists for a scientific, pedagogic as well as professional and leading work, who know the scientific research and are competent to solve scientific and practical problems related to forest ecology and forest silviculture, forest work and technique, forest economy and policy.

The *main task* of the programme is to effect application of students' theoretical knowledge, cognition and research skills in solving silviculture-related issues. Specialists like this are very demanded in the labour market, because a well-elaborated and substantiated natural resource management, which is the basic task of the specialists in this industry, is central to ensuring sustainable and balanced development of Latvia.

Results to be attained in master programme "Forest Science":

- can demonstrate deeper or broader knowledge and understanding, corresponding to the latest discoveries of the forest science or professional sector, and which gives a room for creative mind-set or research, including in diverging point of silviculture and forest ecology or forest work and machinery or forest economy and politics;
- can apply theory, methods and problem-solving skills independently to conduct scientific work or highly qualified professional functions in silviculture and forest ecology, or in forest works and technique, or forest economy and policy. Can explain and discuss complex or systematic aspects of forest science industry or professional sector both with experts and lay persons. Can guide competence development and specialisation independently, take responsibility for staff groups' results and their analysis, run business, innovations in forest science industry or profession, work, conduct research and pursue further learning in complicated and unpredictable circumstances and to change them, if necessary, by applying new approaches;
- Can competently and individually formulate and critically analyse complicated scientific and professional problems in a particular company or country in general: in silviculture and forest ecology or forest works and technique, or forest economy and policy, to substantiate decisions and perform additional analysis, if necessary. Can integrate knowledge from various fields, contribute to generation of new knowledge, development of research or professional methods, demonstrate understanding and ethical responsibility about research outcome in the forest science or possible environmental and social impact of the professional

activity. Can explain and discuss complex or systematic aspects of forest science or professional sector both with experts and lay persons.

Learning outcomes to be achieved reflect coherence and delivery of study programme's name, tasks and goal, preparing a future specialist, who can analyse various information available in relation to forest and similar disciplines, problems and is capable of reasonable evaluation. Thus, students and alumni of LLU programme "Forest Science", by broadening their horizon of processes and global trends of forestry, will be competent specialists in forestry and related disciplines.

After graduation of the theoretical course and successful defending of the master's thesis, the academic Master Degree of Agricultural Sciences in Forest Sciences (*Mg. silv.*) is conferred.

Mission of the academic higher education Master's study programme "Forest Science" is to prepare highly qualified specialists for the forest industry.

Continuing education opportunities: Academic degree in forest science allows continuing studies in the doctoral programme and fulfilling the admission requirements of relevant doctoral programme.

Academic Master's study programme "Forest Science" complies with Cabinet of Ministers Regulation on national standard for study programme No. 240, adopted according to provisions of 13 May 2014 (Annex 4).

Citizens and non-citizens of the Republic of Latvia can apply for master's studies at LLU as well as citizens of the European Union, citizens of the European Economic Area or citizens of the Swiss Confederation and permanent residents of the European Community who have a valid residence permit. The academic study program "Forest Science" admits if the applicant has a bachelor's degree or second level professional higher education in forestry, materials science, agricultural science, biology, environmental science, geography, computer science, management science, economics, transport and traffic specialties. Graduates of the bachelor study program "Forest Science", "Forest Engineering" receive 2 additional points in the competition.

The possibility for foreigners to study at LLU is determined by Article 83 of the Law on Higher Education (<https://likumi.lv/ta/id/37967-augstskolu-likums>, Latvian only).

When choosing to study in English, language proficiency must be B2 or higher, with an appropriate level of language certificate (IETLS, TOEFL, Cambridge English, Pearson Test of English, The ECL Language Exam or equivalent) if English is not the applicant's mother tongue.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Course content is constantly upgraded following recommendations of students and employers, *LLU Forest Faculty Counsellor Convent*; and experts also noted some shortcomings in the course descriptions over the course of licensing of the academic master programme and they have been taken into account until the start of accreditation and all descriptions of courses of the programme have been updated according to Article 56¹ of the Law on Higher Education Institutions (<https://likumi.lv/ta/id/37967-augstskolu-likums>, Latvian only).

The employers confirm that programme's alumni are demanded in the labour market, because they have good theoretical and practical background and ability to complete their assignments individually. Large part of the students and alumni work in industries associated with their profession. It is very difficult to provide an overall evaluation in this aspect, because knowledge acquired in the Master and Bachelor studies differ greatly. They are particularly different for MA students who have acquired Bachelor's degree in programmes "Forest Science" or "Forest Engineer" as they have better practical preparedness than the MA students of other universities and LLU Faculties.

Within the framework of project 8.2.1.0/18/A/007 (consolidation of LLU programme and elaboration of new programmes) a meeting with scientists from LVMI *Silava*, employers, students and experts (both from the industry and foreign university Estonian University of Life Sciences) was organised to get recommendations about the content of the programme "Forest Science", possible alignments with the scientific and labour market trends (Annex 15).

According to the *development strategy of Latvia University of Agriculture*, course programme, its compliance with the needs of the branch, labour market and science trends is updated on a yearly basis by introducing the necessary changes in study plans and delivery process, qualitative and quantitative results of scientific and study methodology are gathered and published in annual reports on study disciplines found in *LLU website*.

Content and delivery of Master's study programme "Forest Science" lay a basis for sustainable development of the programme, because the MA student can demonstrate deeper knowledge and understanding, corresponding to the latest discoveries of the forest science or professional sector, and which gives a room for creative mind-set or research, including when working in fields where silviculture and forest ecology or technique or forest economy and policy come together Scientific, professional and social competence – ability to use knowledge and skills in ever-changing field of study, professional and personal life, review and modify complex study or work conditions requiring new strategic approaches.

Employer recommendations show that LLU Forest Faculty academic Master's study programme provides studies that meet the needs of the labour market, and content and practical application complies with the requirements of EU higher education domain and LR legislative documents.

The alumni work in the manufacturing sector (JSC Latvian State Forests, State Forest Service, private sector etc.), science (LVMI *Silava*) and education (LLU Forest Faculty, Ogre Vocational School etc.), and also continue studies in doctoral programme.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

The programme has been elaborated according to the Law on Higher Education Institutions, Cabinet Regulation No. 240 *Regulation on national standard for academic education*. LLU Senate Resolution No. 10-5 of 13.03.2019. *Regulation on elaboration, approval of and amendments to the study programmes*. Humanitarian and general education courses in LLU Forest Faculty Master's study programme are mandatory in all specialisation directions of the Master's studies. The following specialisation directions are available within the framework of programme: Forest Ecology and Silviculture (MEM), Forest Work and Technique (MTD) and Forest Economy and Policy (MEP). Specialisation starts with choosing of the specialisation course and continues with research traineeship Forest Science I and II (obtaining of independent empirical material for the scientific work).

The programme is aimed at mastering in-depth special knowledge in forest ecology and silviculture or forest work and technique, or forest economy and policy, and reciprocal integration of these fields in the scientific research. Total volume of the programme is 80 credits — compulsory courses 26 credits, restricted electives 23 credits and research traineeship in course *Forest Science I, II* 6 credits each, and 25 credits are given for elaboration and defense of the Master's thesis.

The plan (Annex 1) of programme "Forest Science" was created in accordance with the principle of succession and logic sequence, taking into account the prerequisite knowledge needed for students to acquire each of the courses in question. By successfully mastering the compulsory courses, the MA student can successfully master specialised and industry-based courses.

Course programmes were also created harmoniously with elaboration of course mapping (Annex 5), which shows success of achieving the learning outcomes of the programme in relation to the knowledge, skills and competences included in the course programmes. It can be noticed from information of all courses in the study programme that the content of study courses corresponds to the programme's goal and attainable results.

In the first study year the MA student chooses the supervisor(s) and specialisation of the master's thesis. According to procedure and terms elaborated in LLU Forest Faculty and approved in the methodological instructions *Structure and execution of the theses* (27.10.2015) approved by Forest Faculty's Council sitting, the individual plan of the MA student is approved and course of the studies supervised. Master's thesis is designed to be elaborated in a way to allow the MA student conducting the research in selected field in the first year already, therefore courses *Master Thesis I* and *II* (theoretical research, 5 credits each) and

Forest Science I (research traineeship, 3 credits) were scheduled for the first study year. When preparing the master's thesis for defense, the student must comply with the *LLU Regulation on the Final Examinations of Studies* (Senate Resolution No. 9-163 of 10.10.2018). Volume and execution of the master's thesis is governed by the methodological instructions "Structure and Execution of the Final Study Papers" elaborated in the Faculty.

The study process is based on a centralised planning of lectures, laboratory/practical classes and seminars. Course delivery is focusing on independent work. Essential part of the independent work is preparation of papers, research traineeships and elaboration of the master's thesis. In order to train presentation, speech and argumentation skills, public defense and presentation of papers are organised to support communication and management skills, and often papers and presentations are prepared in a group.

Acquisition of various study courses ensures the achievement of the study results set in the program. The "Forest Science" program is designed to achieve in-depth knowledge of general

theoretical courses, but specialization courses depend on the chosen field of study, their content includes the latest scientific findings and results obtained in industry research. It is ensured that students acquire not only knowledge, but also skills related to information acquisition and analysis, as well as are competent to relate theoretical findings to real production, as well as the latest technologies.

The mapping of study courses reflects the compliance of the results of each study course with the objectives and results of the program (Appendix 5).

Work of the master students is controlled via attendance supervision, regular control of laboratory and practical work knowledge and skills, checking of understanding of questions in seminars and Fail/Pass tests, tests, paper preparation and defense, as well as graded test or examination at the end of the course.

Knowledge of MA students are evaluated according to 10-point system, in line with the criteria approved by *LLU Sentate*.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Academic master programme "Forest Science" is delivered as full-time studies, corresponding to 40 credits in the academic year. One credit equals 16 academic hours. The academic hour is a unit of study work lasting for 45 minutes (*Law on Higher Education Institution*, <https://likumi.lv/ta/id/37967-augstskolu-likums> (Latvian only) *Education Law* <https://likumi.lv/ta/id/50759-izglitiba-likums>, Latvian only). The MA student acquires the education content within the framework of education programme of LLU Forest Faculty, Silviculture Department, as full-time studies, regularly attending the classes organised in the educational institution according to a curriculum.

The academic staff member organises and heads contact lessons – lectures, laboratory work, practical works, seminars and independent works. He or she organises and supervises individual studies. Volume and requirements of the study course and their execution are defined in the programme of each course. Contact lessons of the courses constitute 40%, while number of independent lessons – 60% out of all planned classes. Number of lectures out of all contact lesson in the courses varied between 0-75%, consequently number of all practical works and seminars 25-100%, some courses involve laboratory works comprising 33%. Given proportion changes depending on the functionality of the scientific discipline of particular course and its role in delivery of the ultimate goal of academic master studies and proposed tasks of the programme. Number (%) of practical classes increases in the courses related to actual production and possible responsibilities in future jobs. Several theoretical courses have practical and independent works where one must solve forest and other related, interdisciplinary problems, including tasks and situations of different complexity level. It helps the MA student to dive deeper in the problem either individually or in a group, to describe it by integrating the knowledge, skills and competences acquired in the course, as well as for the university lecturers to evaluate individual or group work – ability to become aware of the problem both qualitatively and quantitatively, propose the most

suitable solution and potential developments in future.

The course Silviculture and Management of Forest Resources in the Master's study programme is delivered fully by the scientists from LVMI *Silava*, AS Latvian State Forests, National Forest Service, employees from Latvian Plant Protection Service and representatives of other industries, where scope of practical skills and knowledge are relatively broader, thus broadening the scope of knowledge of MA students associated with the latest, global trends in forest and related disciplines at the level of certain companies, region and State.

All programmes of courses include information about test types, class sessions, description of individual studies and works, to acquire knowledge, skills and competences specified in study programmes, as well as to pass the course successfully. Consequently, assessment criteria of the study course or its part and information about the final grade / assessment is also included there.

For studies to be passed successfully, each semester the MA student must acquire courses included in the course with total volume of 20 credits (30 ECTS), translating into 40 credits (60 ECTS) in one academic year and 80 credits (120 ECTS) in two academic years. Delivery and supervision of study programme has been created in a form that is understandable for the MA student, making delivery transparent and assessment regular thus promoting achievement of the learning outcomes.

E-studies are available for acquisition of courses, and this media contains study materials, exercises, tests and it also serves as the platform for remote classes.

The following activities are carried out to successfully elaborate the master's thesis. Firstly, the MA student prepares, under the lead of thesis supervisor(s), the basic information about his or her master's thesis (name, purpose, research tasks, work hypothesis(es), work methodology and list of literature reviewing so far conducted research). The submitted information is reviewed by the professors from the Forest Utilisation and Silviculture Departments, whose recommendations and commentaries are submitted to the MA students and supervisors for approval or rejection. Final version of the basic information of master's theses is reviewed and confirmed in the sitting of the leading programme's department, the Silviculture department. Secondly, at the beginning of Semester 3, the MA students receive *Calendar Schedule for Elaboration of Master's Thesis*, which is approved by the Council of LLU Forest Faculty. Thirdly, pre-defense of the draft master's thesis takes place at the end of Semester 3 (draft must contain 60% of the thesis - scientific work methodology must be elaborated, and previous research review must be completed and digitalised empirical data must be available), and second pre-defense (draft master's thesis at 100%; if the thesis fails to be defended, it is not promoted for defense in MEK in the given academic year). Supervisor of the master's thesis must be present in the 1st and 2nd pre-defense of the thesis, where also university lecturers from the Forest Utilisation and Silviculture Department participate.

Starting from 2020, the 2nd pre-defense is organised as the scientific conference of LLU MF Master programme's student aimed at promoting knowledge, skills and competence according to the goal and tasks of the programme.

The theses are submitted according to the Study's Vice-rector Resolution of LLU *On the procedure according to which the digital copies of the master thesis must be submitted and verified for plagiarism in the control system* (04.10.2017, No.2.4.-5./53). Meanwhile, the master's theses are defended in compliance with the Regulation *LLU Study Regulation*, approved with the *LLU Senate Resolution* No. 8-182 of 10 June 2015 (with Amendments to the Senate Resolution No. 9-162 of 10.10.2018).

In order to ensure student-centred education, we work on the observance of certain principles. Already at the beginning of each study course, the results of the respective course are clearly defined and students are introduced to them, the lecturers work individually if necessary to achieve

the study results - recommend additional literature, organize individual consultations, especially in cases where students' bachelor level education is related to other areas, the student knows and understands the defined study results (both the program and the study course). The assessment of the study course achievements is designed so that the student can be sure whether and to what extent the planned study results have been achieved. At the centre of the whole study process is the student who is able to study independently, it is clear to the student how the set of results of individual study courses forms the results of the study program. The task of the lecturers involved in the implementation of the study program is to promote the educational process so that the student achieves the set study results. In order to continuously improve the study process and the content of study courses, at the end of each study course students provide both quantitative and qualitative assessment of the respective acquired study course.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

Scientific research traineeship is conducted under a supervision of master's scientific supervisor or supervisors, according to the goal of the programme and implementation of subordinated tasks. During the scientific research traineeship, the MA student collects data required for elaboration of the scientific work (results of experiments or observations, archive materials, surveys and other information), at the same time getting acquainted with the content of the scientific project monitored and performed by the scientific supervisor and methodology applied. Topic of the master's thesis is often derived from a project. In this case the MA student is added to the list of project performers (other performers).

In the academic programme and within the framework of all specialised courses, theoretical knowledge of students is supplemented in seminars and practical classes by acquiring the necessary knowledge, skills and competences.

Scientific research practice is carried out within the study courses *Forest Science I* (3 KP) (4.5 ECTS) and *Forest Science II* (3 KP) (4.5 ECTS), respectively in accordance with the study plan in the 2nd and 3rd semesters. Within the framework of scientific research practice, master students, in accordance with the chosen topic of the master's thesis, get acquainted, acquire skills and knowledge in performing research work in order to be able to independently and critically use modern scientific work methods. During the practice, students collect data for the master's thesis and perform experimental work. Master students acquire and strengthen knowledge about the course of scientific research work. Skills are developed to search for information, to develop research methodology, to plan and perform experiments, to process the obtained data. As a result, master students are competent to conduct scientific research and develop a master's thesis. At the end of the scientific research practice at the end of the 2nd semester the student must submit an individual report on the work performed during the practice and the information collected, defend the practice report on approbation and validation of the research methodology, at the end of the 3rd semester the master student must submit digitized data.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

With a resolution of LLU Senate (No.8-208, 09.12.2015, updated No. 9-44, 19.10.2016 and No. 9-74, 08.03.2017) the adopted *Strategic plan of the Latvia University of Agriculture 2015-2020* and resolutions of the Forest Faculty Council recommend developing the study process through gradual improvement of study content and quality. Master studies are the only way to prepare prospective doctoral students in forest sciences.

Supervisors of the master's theses, who participate in or head the scientific projects, involve also MA students in the scientific projects thus promoting their skills and experience in experiment planning, collecting of empirical material, mathematical data processing, result interpretation and presentation. Besides, some part of master students co-author in the scientific publications. Forest Faculty Council Convent, which formulates current demands of the industry, making sure they are integrated in the study programme, and also including the topical problems of the industry in elaboration of the thesis, have positive impact.

Coherence between the industry and compliance with its regulations is ensured by the composition regulations for *Master Examination Commission (MEK)*. MEK consists of 3 leading researchers from 3 LVMI *Silava*, 3 teaching staff members from the Forest Faculty and one representative from AS *Latvijas valsts meži* (Latvian State Forests) (holding a doctoral degree). The chairman is director, leading researcher and visiting professor of LVMI *Silava*. When discussing the quality of the master's theses and defence progress, positive and negative changes are emphasized and possibilities to prevent negative aspects are discussed. Commission's recommendations for improvement of content and quality of master's theses are taken into account when submitting the annual self-evaluation of programme and improvement of academic Master's studies in programme "Forest Science".

Research on various forest ecosystems, their restoration, management of risk factors and solving thereof, on carbon deposits, logging, volumes of energy wood etc. is conducted in the master's theses.

Topics of master theses are diverse and it is a desirable trend in the Master's study programme. Some MA students continued to explore their chosen research subject deeper and more comprehensively in the PhD studies. The research is topical in science, economy and labour market (Annex 6).

In certain cases, one can see lack of advisory work from the thesis' supervisor concerning development of the methodology, and some theses lack signs of scientific approach. Some MA students use incorrect forest industry terminology, especially those who have not graduated from the Forest Faculty.

In case of interinstitutional research, choice of two supervisors – from LLU academic staff and researchers of scientific institutions – was supported, and thesis was elaborated or the data collected within the framework of their research.

In order to improve the quality of the papers in the forest science and enhance total competitiveness of forest science in the domain of Latvian higher life-long learning and forest science, interinstitutional cooperation between LLU and LVMI *Silava* was implemented when organising a mutual communication since 2019 and regarding the topics of master's theses yet to

come. In order to improve the quality of the final papers, 2 supervisors are involved in elaboration of the master's thesis and management of the scientific research traineeship with a Resolution of the Forest Faculty since 2020: One must come from the Forest Faculty, but the other may be from LVMI *Silava*, production company or another educational institution.

Digital copies of the final papers submitted to MEK Commission before evaluation are submitted and verified for plagiarism in the Control System (Study Vice-rector's Resolution No. 2.4.- 5/53 of 04.10.2017 *On procedure by which the digital copies of the final papers are submitted and verified for plagiarism in the control system* and Rector's Resolution No. 4.3.- 8/43 of 19.04.2016 *On individual review of final study papers in single computer-aided plagiarism control system*). If the System detects 10% of overlapping of the final paper's text with other paper, LLU reviews the thesis in the Forest Faculty Methodological Commission and decides if it is a plagiarism, and before doing that, it gets personal explanation from the author and supervisor(s) of the thesis. Only after successfully passing the plagiarism System control, MEK commission evaluates the submitted theses and the commission confers the academic Master Degree in Forest Sciences to the authors of theses defended successfully. Some MA students continue studying in PhD programme right after graduating from the Master's study programme. Some postpone the PhD studies mainly because they have started the scientific activity in LVMI *Silava* and they access LLU PhD studies at some later stage.

In year 2019 Masters' examination commission (MEK) received 16 master's theses for evaluation. All of them were successfully defended (evaluation - passed). The commission awarded a master's degree (Mg.silv.) to the authors of successfully defended works. In its turn, in year 2020 18 master's theses were submitted, of which 15 were successfully defended (assessment - passed) and 3 unsuccessfully (assessment - failed). This situation can be explained as a consequence of the Covid-19 pandemic, which manifested itself as communication difficulties between the parties involved - the master's degree applicants themselves, their supervisors and the MEK.

In each of the study years, three of the successfully defended works were recognized as excellent. The research topics in them range from tree protection against *Cervidae* family animals damage to wind resistance of Norway spruce but all the topics of master's theses were relevant to nowadays.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

LLU has introduced Student Survey System conducting regular student surveys each semester on the quality of studies and academic teaching staff in 5-point system. Survey results are available for each university lecturer of a particular course, director of the study programme, dean, employee in charge from the LLU Study Centre, study Vice-rector.

MA students were asked to rate the quality of academic teaching staff according to the following criteria:

- the academic staff member introduced the student to course's goal, expected results and evaluation in the beginning of the course;
- the academic staff member explained the course content understandably;
- teaching methods/tuition methods facilitating the acquisition of course were used in the course delivery;

- the academic staff member sparks interest/excitement in students to promote their participation;
- the academic staff member provided feedback (explanation, analysis) about the results of learning/tests;
- the academic staff member was available for consultations (Annex 7).

If 2-5 academic staff members deliver lectures, practical or laboratory works and seminars, the quality of each of them must be evaluated separately.

Digital survey questionnaires are anonymous and are not related to particular MA student; the obtained results are important for the improvement of study quality, therefore we encourage each student to find time for expressing their opinion by filling out the questionnaires. Part of the MA students believe – if the situation feels satisfactory, why should they fill out the questionnaire. Referring to the student survey and interviews, it is possible to substitute the academic staff member delivering the course, for example, in the course *Research Methodology*.

Every year LLU IS conducts a student survey about the programme through 18 questions, for example, about study plan, courses and their sequence, work of the study programme director, administrative staff and supporting staff in teaching, cooperation with the supervisor of thesis, skills and competences obtained during the studies, internet availability in LLU and information availability at LLU IS. The results obtained are analysed and evaluated thoroughly, relevant decisions are made to improve the study quality. Survey results are compared against the results from previous period. Average rate given by the MA students to the programme was 3.9 in 2019 and 3.7 in 2020. The average rate has slightly decreased due to Covid-19 pandemic restrictions in study process – there are no field seminars in nature, no face-to-face meetings with supervisors of the master’s thesis, because the entire process is managed remotely, to the dislike of MA students.

According to the survey of master students, changes were made in the study program that from 2020/2021 study year - both the study course *Principles of Forests Science* (MežZ5048) and *Silviculture* (MežZ5047), each in the amount of 3 ECTS will be available for all master students.

In order to ensure and guarantee a proper quality, each year the strengths and weaknesses, development potential, academic resources, materially technical basis, internal financial provisions of the study programme are evaluated. All previously stated is evaluated in LLU *Forest Faculty Council Convent*, student self-government, student association *Šalkone*, in sittings of LLU Forest Faculty methodological commission and Silviculture Department. Director of the Master’s study programme “Forest Science” in the MF Council sittings present self-evaluation of previous academic year, emphasizes strengths and prevention possibilities for weaknesses.

As a result of the open competition within the project No. 8.2.3.0/18/A/009 “Services of industry experts for evaluation of the content of study programs and provision of recommendations” evaluations and recommendations were received from forest industry experts, who are also employers. It was possible to implement the recommendation and along with the change of lecturer, it was also possible to implement the recommendation of the employers' representative in the content of the study course “Research Methodology” - students are provided with as detailed information as possible about the research methods used in forest sector research.

All changes to the legislation governing the studies are available to anyone on LLU website *Mans LLU*.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of

the study courses acquired during the mobility.

International cooperation centre delivers higher education exchange programmes of the European Commission, and within the framework of the bilateral agreements students of LLU and LLU partnering universities are allowed to take advantage of studies, lecturing or experience exchange abroad. By promoting expansion of LLU international cooperation network, taking care of the recognisability of the university and providing students and academic staff members with the necessary experience exchange, international mobility is an integral part of modern and innovative university activity. The students have incoming and outgoing mobility options. So far the outgoing mobility of students and academic staff member has been implemented, because the programme was launched relatively short time ago. When comparing the three year's statistics, one can conclude that the outgoing mobility had an increasing trend until onset of Covid-19 pandemic.

Study results and credits obtained during *Erasmus+* studies are recognised and added by the director of **programme "Forest Science"** according to the Rector's Resolution "*On the procedure of academic recognition in LLU*". LLU Forest Faculty has been involved in the international Master's study programme *Euroforest Msc programme* represented by the Baltic Sea region countries (Latvia, Lithuania, Estonia, Sweden, Poland, Denmark, Germany, Ukraine, Russia). Each year 1-3 MA students acquire programme "Forest Science" for one or two semesters. Courses *Erasmus+* and *Euroforest MSc programme* acquired within the framework of mobility are recognised and aligned to the courses delivered in academic Master's study programme "Forest Science" (1.0 credits = 1.5 ECTS) if they are harmonised with the *Study Agreement* and relevant amendments, in case of positive evaluations.

Master mobility - academic year of 2017/2018 *Erasmus+* in the exchange programme were used by 3 MA students (10.7% of the total number of students) - Czech Republic, Prague, Czech University of Life Sciences (1), Portugal, Lisboa, Universidade de Lisboa (2); academic year of 2018/2019 - 4 MA students (7.7%) - Sweden, Swedish University of Agricultural Sciences (2 MA students) and Czech Republic, Mendel University in Brno (2). In September 2020, three first-year MA students started studying in the Swedish University of Agricultural Sciences (Annex 8).

When comparing the study plan of Master's study programme "Forest Science" with *Euroforest MSc programme*, it must be concluded that in terms of volume and structure both programmes overlap. Volume of both programmes is 80 credits (120 ECTS respectively), they are expected to be delivered during two study years (four semesters), distribution of study load by study years and semesters is even. Time devoted to elaboration and defense of the scientific work or master's thesis slightly differ, and in Latvian University of Agriculture it is 25 credits (37.5 ECTS) and Swedish University of Agricultural Sciences it is 20 credits (30 ECTS).

Incoming mobility of master students - year 2017 - studies in the *Erasmus+* exchange program were carried out by 1 master student - Italy, Università degli Studi di Bari Aldo Moro, year 2018 - 8 MA students - France, ISTM Ecole Supérieure D'agro-Développement International (2), Ecole Supérieure du Bois (3), Sweden, Swedish University of Agricultural Sciences (1), Czech Republic, Mendel University in Brno (1), Spain, University of Huelva (1), year 2019 - 6 MA students - France, Ecole Supérieure du Bois (4), Slovakia, Technical University in Zvolen (1), Romania, Transilvania University of Brasov (1), Based on a bilateral cooperation agreement on student exchange in year 2019 - 1 MA student from Russia (Saint Peterburg Forest Technical University). In year 2020 - 3 MA students from France, Ecole Supérieure du Bois, used *Erasmus+* mobility opportunity. Of the 19 MA students incoming during the period, France was represented in 63% of cases.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Six structural units are involved in delivery of academic Master's study programme "Forest Science". The main special courses (both compulsory, restricted electives) are delivered by three Departments of the Forest Faculty: Department of Silviculture (MEZK), Department of Forest Utilisation (MIZM) and Department of Wood Processing (KOKA). However, Department of Mathematics (MATE), Language Centre (VALO) and Institute of Soil and Plant Science (AAZI) are involved in delivery of some courses, particularly from the compulsory section. Large part of compulsory and restricted elective courses is delivered by the academic staff members from the Forest Faculty, while some courses - in previously mentioned structural units of LLU. Structural units involved in the programme are provided with the necessary study base, which is being constantly upgraded. Steps are taken to modernise premises and equipment on a regular basis, to prepare methodological materials, qualification upgrade of assisting staff.

Administrative and technical staff provides support for academic Master's study programme "Forest Science" and it is sufficient to achieve the learning outcomes. Methodological, informative and materially technical base, equipping of premises and environment of studies for the programme is sufficient and can provide efficient means for studies in the Master's study programme "Forest Science". Where required, laboratories in LVMI *Silava* are available for the research, inviting the scientists to collaborate in supervision of the master's thesis, which is successfully implemented from year to year.

Multimedia projectors and classrooms with wireless internet connection are used in the course teaching, allowing to project relevant information in lectures, laboratory works and practical classes on the screen and using internet resources where necessary. Two computer classes are available for MA students in the Faculty, where the computers have special forest management planning computer software installed and also software for data processing and designing. MA students can use four computers located in the *Information Centre* of the Faculty for elaboration of their individual study papers.

Study provision of the academic Master's study programme "Forest Science" meets modern requirements and possibilities - computers, multimedia, internet, library, e-studies (<https://estudijas.llu.lv/?lang=en>), are used where the course materials are available and also academic staff members can be accessed via ICT technologies.

LLU Fundamental Library, uniform library data network allows sourcing of information both from the internet and inter-library subscription. One can also use electronic databases. Library offers its visitors various online databases (for example, CAB Abstracts; CRC Press e-books; EBSCO databases; EBSCO eBook Academic Collection; ScienceDirect journals; Scopus; Web of Science etc.)

and databases in other media. The library has purchased a searching software PRIMO DISCOVERY, enabling simultaneous search in the subscribed and free online databases, electronic Joint Catalogue of national-level libraries, LLU FB databases (publications of LLU academic staff members, LLU Master Theses etc.). When registering with LLU IS user account, one can view his or her user account and extend loan issuing deadlines, subscribe for published materials, access full texts in the subscribed online databases, save search results. "Information Search Assistant PRIMO" is available in the Library's website. Access to online databases is provided 24/7 in LLU network, as well as for authorised users outside LLU network through EZproxy and LLU IS user account.

LLU library files, their equipment and services allow attaining learning outcomes and create a favourable environment, besides library files are available also in foreign languages. The most recent literature in the speciality written by local authors and academic staff members and foreign authors is available in LLU Fundamental Library and also Information Centre in the Forest Faculty (Room No. 27) for MA students and they can access methodological materials for acquiring the course and volumes of international scientific conferences and scientific journals. Students can use computers situated in the Library and the Information Centre of the Forest Faculty to read scientific publications, and they can also access electronic databases of scientific articles.

Silviculture and Forest Utilisation Departments of the Forest Faculty also offer the latest literature and legislation to the MA students.

E-studies must be used while studying in order to upload/download learning and auxiliary materials, gather and evaluate attendance of contact lessons, assessment of tests and final exams, as well as to engage in interactive communication and deliver new courses.

During recent years, when implementing the EU co-funding, current laboratories (Wood Science Laboratory, Hunting Laboratory) are supplemented with modern devices, and a new laboratory – Precision Silviculture Laboratory, Forest Protection Laboratory and educational booths were created. In the hall, situated on the second floor of the Forest Faculty, there are 25 workplaces arranged for independent work of students and LLU Woodworking Department's scientific laboratory at 41 Dobeles Street (devices for determining physical and mechanical properties, determining of physical and chemical properties, determining of material surface properties and preliminary preparation of materials).

Number of study places from public funding are stipulated in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Agriculture (LLU). It is defined in the trilateral contract on the funding for 2020 year that the basic costs of one study place is 1,518.98 EUR, study level ratio for Master programmes is 1.5 and social provision of the study place for Master programme is 164.34 EUR, study cost ratio in education in the thematic area for Master programme "Forest Science" is 1.8 (ratios for each thematic education area vary, they are stipulated in the Regulations of the Cabinet of Ministers "Procedure according to which higher education institutions and colleges are financed from the state budget"), costs per one student of the Master programme "Forest Science" is 4,264.86 EUR..

Every year the LLU Senate confirms distribution of revenue and expenditure of LLU combined budget structure, which is prepared in compliance with the law "On the State Budget" annually passed by the Saeima, and annual order of the LLU rector "On Planning of LLU Combined Budget". The combined budget is controlled and audited by an external sworn auditor, whose opinion and report are reviewed and confirmed by the Senate.

Before the revenue and expenditure of LLU combined budget are approved in the Senate, it is reviewed, discussed and approved by the Action Group for Resource Utilisation and Development, which consists of the rector, vice-rectors, chancellor, Director of LLU, deans of all faculties,

head/CFO of the Resource Accounting Centre, head of the Finance Planning Centre, chief economic officers, main specialists in the real estate and legal matters.

Distribution of revenue and expenditure approved in LLU Senate determines that 80% of the assigned state funding comprise remuneration and 20% comprise other costs. 60% of funds from paid studies are spent for covering remuneration costs and 40% – for other costs, 20% of which are in direct control of the Faculty delivering the relevant study programme. Volume of funding of the scientific base is calculated and granted annually from the active scientific work. Scientific base funding, amounting to 50%, can be spent by the Faculty, and 50% are intended for covering central costs. Scientific funding comprises the funds attracted for project implementation.

Study fee for the academic year of 2020, full-time studies comprise 2,140 EUR. Study fee for academic year of 2021/2022 for programmes delivered in English, are 3,100 EUR per year. Rector's Decree No.4.3.-8/76 *On the study fee in programmes delivered in English in academic year of 2021/2022*.

Breakdown of LLU combined budget consists of estimates of the structural units / Faculties where the costs are divided by their type of expenditure (Annex 9).

In 2020, the specific weight of the costs in the Master programme "Forest Science" comprises:

- Wages – 72%;
- Scholarships – 7%;
- Products and services – 17%, incl. utilities – 6%;
- Building of the fixed capital – 4%.

See information provided in Section 2.3 of Part 2.

An equivalent infrastructure is available for the implementation of the "Forest Science" master study program in English. Wireless network is available in all LLU buildings, students can connect to it using their username and password. Students have the opportunity to use open access computers with access to the Internet and library databases. All auditoriums are equipped with multimedia projectors or screens connected to computers. For the needs of the study process, computer classes are available, equipped with various data processing programs and used for the implementation of certain study courses, master students can use them for data processing.

Students are provided with a developed IT infrastructure and virtual study environment: e-learning environment (developed on the basis of Moodle, study materials, additional materials, communication with students is assessed, students' knowledge is assessed; there is a video conferencing system BigBlueBotton for organising meetings).

Master students can use 1) hostel services; 2) LLU Sports Center services and 3) LLU Fundamental Library services.

When starting studies, each student is assigned a username and password, which can be used in the LLU IT systems for students: e-learning environment, MansLLU, LLU e-mail, students' personal account, including library services.

All students and academic staff have access to the LLU Fundamental Library (LLU FB), its large reading room and subscribed databases. Textbooks are available in the library for study courses, but in the reading room - also scientific monographs, which can be found in one copy. LLU FB is an accredited library of national significance, which provides users with information resources. More information on all services provided by the LLU Fundamental Library can be found in Chapter II Part 3 of this report.

All LLU premises are suitable for studies, LLU buildings, student hostels and faculties have built elements of environmental accessibility for people with disabilities to ensure access to education for every student. Elevators, specially equipped facilities, ramp are available in some buildings. The

requirements in accordance with the provisions of the current regulatory enactments on the quality of study premises have been complied with.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

LLU Forest Faculty has accumulated experience over many years in preparing highly qualified silviculture specialists, it has expanded its material and informative base. The Faculty has competent academic staff rooted in traditions and history, pursuing research in their industry and transmitting their knowledge and experience to students. Of course, the Forest Faculty cyclically renews the academic staff, and hence the leading scientists from Latvia and doctoral students from the last years of PhD studies or admitted doctoral students who are potentially qualifying for PhD degree and drive the renewal of academic staff. Currently the existing professors, associated professors and leading scientists from LVMI Silava, together with potential PhD candidates co-author on publications and collaborate in projects to speed up and facilitate defense of the theses. Doctor of Science (PhD) holding a scientific doctoral degree. In 2020, two candidates were conferred Agriculture and Fishery PhD in Forest Sciences. Persons who received PhD are involved in leading the research traineeship and supervision of master's theses as the second supervisors. At the end of 2020, it was planned that 2 visiting lecturers would submit their doctoral theses to the Doctoral Council for review and defense in 2021, and they already engage in upgrading of Master's study programme courses and heading of works. Some courses have a person in charge for the overall course content, however the course is delivered by several academic staff members, for example, course Principles of Forest Science are delivered by five staff members - professor, associated professor, university lecturer and 2 visiting university lecturers. The composition has changed and impact on study quality has improved. In the course Management of Forest Resources, delivered by an experienced leading employee from AS Latvijas valsts meži (Latvian State Forests) and supported by visiting lecturers from the industry, LVMI *Silava* and other countries (Estonian University Life Sciences (2), Warsaw University of Life Sciences (2)). This course gives insight into the latest trends of the forest science, forest industry and management of the sectoral businesses. This knowledge allows students understanding the development direction of modern silviculture production, bioenergetics and timber processing. The course helps achieving a deeper understanding of development of forest resource utilisation balance and role of the forest industry in Latvian economy. Every year the head of this course makes small corrections in the makeup of the lecturers on the basis of student feedback and presentation skills of the lecturers. The invited visiting lecturers are knowledgeable, but not everyone is born to be a good lecturer, therefore

composition of lecturers is slightly adjusted from year to year (Annex 10).

In the reporting period one associated professor discontinued employment relations with LLU MF because he joined business in the private sector. Two professors could not run repeatedly for elections of academic positions, because the requirements intended for candidates were not met (LLU Senate approved the *Regulation of the Latvian University of Agriculture on academic positions*). They currently work as visiting university lecturers in the academic Master's study programme. Two professors and one associated professor discontinued employment relations due to retirement.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Division of academic lecturers and their courses of "Forest Science" into groups shows that out of 29 courses 7 are delivered by professors (24.1%), 1 - visiting professor (3.4), 3 - associated professors (10.3%), 4 - associated professor Emeritus (13.8%), 4 - university lecturers (13.8%), 4 - visiting university lecturers (13.8%), 1 - lecturer (3.4%), 5 - visiting lecturers (17.2%). Lecturers and visiting lecturers work under the supervision of associated professor and professor (Emeritus).

The qualification of visiting professors, associated visiting professors, visiting university lecturers and visiting assistants meets the requirements of study programme delivery and legislative provisions. Visiting professors, associated visiting professors and visiting university lecturers hold PhD, while lecturers and visiting lecturers have doctoral or master's degree, or they study in LLU PhD programme, or have been admitted to the PhD studies and are working at their doctoral thesis. The visiting lecturers are potential candidates for PhD degree in future. The number of academic staff members elected allows long-term planning the study process. Growing numbers of academic staff members with PhD degree and involvement of the scientists and practitioners allow improving study quality and compliance with the labour market requirements (Annex 12).

In order to support sustainable development of Master's study programme "Forest Science", the academic staff members undergo systematic professional upgrade and systematic academic staff member upgrade policy is planned and implemented according to the needs of Latvia and region.

The academic staff of the Latvia University of Agriculture complies with the *Law on Higher Education Institutions*, LLU regulatory enactments and *Constitution* of Latvia University of Agriculture. The academic staff is entitled to engage in decision-making at the level of faculties and university, including the work of LLU *Senate*. The academic staff is given the freedom of studies and research and it plays an important role in quality of the study process.

The academic staff is given a chance to develop their professional competence, based on the scientific activities, thus strengthening a link between the education and science. Application of innovations in teaching methods and new technologies is supported.

The teaching staff attends course *Innovations in University Didactics* every 5 years or for a duration of 5 years, consisting of 100 hours' programme (academic year of 2017/2018 - 4 academic staff

members, academic year of 2018/2019 – 1 and 2 in 2019/2020). The academic staff members participate in LLU Methodological Teaching Conferences biannually, enriching their knowledge with the latest information to improve study quality, apply technologies on use of teaching materials and other areas.

Teaching staff members delivering the specialised courses, upgrade their qualification through qualification seminars, local and international scientific conferences, organised by LVMI *Silava*, AS *Latvijas Valsts meži*, State Forest Service, Latvian Plant Protection Service, cooperatives of private forest managers, for example, forestry service cooperative company “L.V. Mežs” and others. Academic staff members from the Forest Faculty actively participate in the forest days and seminars (each academic staff member attends 3-6 seminars on average per year, and each seminar lasts for 2-8 hours). Topics of the seminars are very diverse: *Silviculture, Forest protection and security, Game farm, Bioeconomy, Timber processing etc.* (Annex 12)

Internship and experience exchange is aimed at qualification upgrade, at the same time promoting cooperation between the countries. There is an especially close cooperation between the Polish University of Life Sciences (SGGW) and LLU Forest Faculty (2 academic staff members participated in 2018 and one in 2019), as well as participation in *ERASMUS* programme. Academic staff mobility: In the academic year of 2017/2018 lectures were read in Aleksandras Stulginskis University (1), experience exchange took place in Technical University in Zvolen (1) and Estonian University of Life Sciences (1). In academic year of 2018/ 2019 lectures were read by 14 academic staff members from the Forest Faculty, including those who head courses in the Master’s study programme “Forest Science”. Lectures were read in Estonian University Life Sciences (3), Warsaw University of Life Sciences (3), and experience exchange took place in University of Bari Aldo Moro and University of National and World Economy (1) (Annex 16).

Attendance of various modules in *Innovations in University Didactics*, internship and experience exchange, participation in *ERASMUS* programme, seminar attendance elevates academic staff qualification, allowing to achieve successful learning outcomes in the academic Master’s study programme “Forest Science”.

Academic staff members improve their professional competence when engaging in collegial institutions – Doctoral Council (5 university lecturers), Latvian Association of Botanists (4 university lecturers) etc., as well as participating in the editorial board of journals (*Baltic Forestry* (4), *Research for Rural Development* (1) u.c.), heading of conference sessions in Latvia (*Research for Rural Development, Students on their Way to Science etc.*) and foreign conferences – in Bulgaria (*GeoConference SGEM, “Hydrology and water resources”*), Lithuania (*Rural Development*).

University lecturers publish articles in internationally indexed journals, such as *iForest, Forests, Baltic Forestry, European Journal of Forest Research, Silva Fennica, BioResources, Agronomy Research* etc., who are indexed in several databases, including *Scopus* and *Web of Science*; anonymously reviewed international scientific publications, including proceedings. International conference materials (*Abstract*), scientific popular and scientific methodological works (text-books, other publications) are published (Annex 13).

Participation of the academic staff in applied scientific conferences during the reporting year was active, Forest Faculty organises conferences every year together with LVMI *Silava*, and academic staff members partake there as participants and present their research achievements and also in a capacity of listeners. The academic staff members actively participate also in international scientific conferences, congresses, symposiums in Latvia and beyond, both with verbal presentations and booth papers, for example, in several international LLU scientific conferences <https://www.llu.lv/en/scientific-conferences>, international conference *Sustainable management of natural resources – Baltic Sea region as the driving force*, annual international scientific conference

Research for Rural Development, annual international multidisciplinary scientific *GeoConference SGEM* (Bulgaria), *IUFRO* congress (2017), Worldwide Latvian Scientists Congress (2018) etc. (Annex 14) University lecturers who supervise study papers and theses, invite students to attend conferences and publish results of their research, when working with students.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

During the reporting period the academic staff members were involved in various scientific-research activities as participants or heads of institutions' projects and programmes - EU, Latvian Science Council, Ministry of Education and Science, Ministry of Agriculture etc. Thanks to the research programmes, created by LLU, for example programme *Strengthening of Scientific Capacity in LLU*, academic staff and doctoral students can compete for the financing devoted to research (Annex 17).

The new PhD holders can also compete for the financing devoted to postgraduate research support projects (1 new doctor), which is a significant achievement, providing a possibility for the new scientists to start a career and to develop their competences and add to the number of qualified specialists.

Each year applications are submitted for projects financed by the state and EU structural funds, National research programmes, in cooperation with the academic staff members and researchers from several LLU faculties as well LVMI *Silava*, *AS Country* and other forestry companies in Latvia.

Results of the scientific activity are used in the delivered courses, updating their content and informing the students about industry topicalities, supervising the courses and theses. The newly

acquired knowledge, skills and competences enhance study efficiency and bring the mastering of courses closer to the real work.

In this aspect, it is important to highlight the assoc.professor., Dr.silv. D. Dubrovskis, who in his study courses "Forest Value" and "Principles of Forests Science" uses the latest findings gained by managing projects (1) Dubrovskis D. (2017). Research of forest and subsoil resources, sustainable use - new products and technologies. Research in the field of wood processing, logistics and planning of forest products State research program project leading researcher, project manager. 2) Dubrovskis D. (2017). Adaptation of forest inventory information obtained from remote sensing technology data to LVM forestry spatial and activity planning support. LLU research project leading researcher, project manager) and preparing publications (Dubrovskis D. (2018) Research in the field of wood processing, logistics and planning of forest products; Dubrovskis D. Research in the sphere of wood processing, logistics and planning of forest products; Dubrovskis D Forest science: a branch of science that studies forest ecosystems, their management methods and history).

The study course "Forest Ecology" is led by prof., Dr.silv. I. Straupe, transferring the latest findings to students from projects (1) Straupe I. (2017 - 2018). Integration of the EU support system in the management of private forests in Latvia. Research program "Strengthening of scientific capacity at LLU", project manager; 2) Straupe I. (2019) LLU project "Implementation of LLU research program" P-8 Application of forest management of Scots pine *Pinus sylvestris* L. to reduce climate change and preserve biological diversity; 3) Straupe I. Jelgava City Council / LLU contract work K54 "Evaluation of city quality and development of air pollution zoning for Jelgava city administrative territory (Forest and Water Resources Scientific Laboratory) - leading researcher (01.07.2016 - 31.03.2017); 4) Straupe I. Green infrastructure approach: combining environmental and social aspects in urban forest research and management Cost action FP1204, Member of the Steering Committee and member of the working group, 24.01.2017. - 30.04.2017) and prepared publications (Straupe I. (2018) Recreational use of urban green infrastructure: the tourist's perspective / Theano S. Terkenli, Simon Bell, Ivana Živojinović, Jelena Tomičević-Dubljević, Thomas Panagopoulos, Inga Straupe, Oliver Tosković, Katarina Kristianova, Linda Straigyte, Liz O'Brien, Bardulis A., Jansons A., Bardule A., Zeps M. Bērmanis R., Straupe I., Zvirbule A. (2018) Growth private forest area, parameters of afforested areas and utilization of European Union funding for this purpose during the last 10 years).

An invaluable contribution to the high level of the master's study program "Forest Science" is given by assoc.prof., Dr.silv. Ā. Janson's contribution. As a leading researcher at LVMI "Silava", he has extensive experience in many local and international projects, as well as preparing scientific articles for high-ranking scientific journals on such important topics related to climate change today and directly related to the study course "Principles of Tree Adaptation" (Jansons Ā. Bārdulis A., Ķēniņa L., Lazdiņa D., Džeriņš E., Kāpostiņš R. (2017) Carbon content of below - ground biomass of young Scots pines in Latvia; Jansons Ā., Matisons R., Baliuckas V., Purina L., Krišāns O., Jansons J., Baumanis I. (2018) Performance variation of lodgepole pine provenances in Latvia, Jansons A., Matisons R., Pobiarsens A., Sisenis L., Neimane U. (2017) Proportion of knotty wood in stems of 28-year old lodgepole and Scots pine in experimental plantation in Zvirgzde, Latvia; Jansons A., Rieksts-Riekstiņš J., Senhofa S., Katrevics J., Lazdina D., Sisenis, L. (2017) Above-ground biomass equations of *Populus* hybrids in Latvia, Jansons A., Zeltins P., Donis J., Neimane U. (2020) Long-term effect of *Lophodermium* needle cast on the growth of Scots pine and implications for financial outcomes).

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the

study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Cooperation among the academic staff members is coined in joint meetings discussing programme content, course sequence, goals and results. In some cases, the academic staff members meet individually to discuss a particular topic. Academic staff members collaborate in delivery and improvement of course content, putting coherence in place and engaging in the work of Methodological Commission of the Forest Faculty. The forest science is closely related to many other scientific disciplines, especially in processing of empirical data obtained, for example, mathematics, computer sciences, therefore academic staff members who have good knowledge of aforesaid are involved in the programme and courses, thus broadening the horizon of knowledge and competences to be acquired in the programme where it touches other scientific disciplines, and they also support cooperation among academic staff members and researchers from various faculties.

Forest Faculty widely and actively cooperates with LVMI *Silava* and LVKĶI (Latvian State Institute of Wood Chemistry) research institutes. Two leading researchers from LVMI *Silava* supervise study courses Silviculture (2 credits) and Management of Waterlogged Forests (3 credits)

University lecturers from other faculties are engaged as consultants in elaboration of the master's theses related to specifics of other science industries.

The total number of master students in the program (2020/2021 academic year as of October 1) is 49, while the number of teaching staff is 37. The ratio of students in the study program to teaching staff is 12.9 (Annex 3 and 16).

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	3_pielikums_statistikas_dati_par_stud_magistra_mezzinatne_lv_en.docx	3_pielikums_statistikas_dati_par_stud_magistra_mezzinatne_lv_en.docx
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	4_pielikums_Compliance-with-State-Ed-Standard_en_preciz.pdf	4_pielikums_Atbalstiba-valsts-izgl-stand_lv_preciz.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	5_pielikums_Studiju_kursu_kartesana_Mapping_Mezzin_mag_lv_en.xlsx	5_pielikums_Studiju_kursu_kartesana_Mapping_Mezzin_mag_lv_en.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	1_pielikums_Study_program_plan_Mezzin_mag_en_preciz.pdf	1_pielikums_Studiju_progr_plans_Mezzin_mag_lv_preciz.pdf
Descriptions of the study courses/ modules	Study-courses_Mezzin_mag_EN.rar	Studiju-kursi_Mezzin_mag_LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikums_Mezzin_mag_en.rar	Diploms-un-pielikums_Mezzin_mag_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	mag_stud_progr_Mezzinatne_AIP_atzinums_EN.docx	mag_stud_progr_Mezzinatne_AIP_atzinums.pdf

Forest Science (51623)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Forest Science</i>
Education classification code	<i>51623</i>
Type of the study programme	<i>Doctoral study programme</i>
Name of the study programme director	<i>Āris</i>
Surname of the study programme director	<i>Jansons</i>
E-mail of the study programme director	<i>aris.jansons@llu.lv</i>
Title of the study programme director	<i>Dr. silv.</i>
Phone of the study programme director	
Goal of the study programme	<i>The aim of the doctoral study program "Forest Science" is to promote the development of forest science and, through effective cooperation of scientific institutions of the field, to ensure the formation of a new generation of scientists with international qualifications, creating opportunities for doctoral students to learn higher level theoretical studies, research methods to develop a theoretically, practically and scientifically significant doctoral thesis that would stimulate advancement of the forest sector in the sub-sectors "Forest Ecology and Forestry", "Forest Economics and Policy", "Forest Economics and Technology" of the scientific field "Agriculture, Forestry and Fisheries" and to obtain an internationally recognized degree: Doctoral degree Doctor of Science (Ph.D.).</i>
Tasks of the study programme	<i>The tasks of doctoral studies are: - to ensure the training of new scientists for solving scientific issues relevant to the forest sector and boosting the development of the sector; - to provide comprehensive knowledge to doctoral students in order to ensure the ability to apply classical and the latest qualitative and quantitative methods of forest research and to deepen theoretical training in the chosen sub-sector of science.</i>

Results of the study programme	<i>As a result of the implementation of doctoral theoretical studies and the process of scientific work, scientists and highly qualified specialists are trained, who knows and understands the current theories and findings of forest science, is familiar with the terminology used in forest science and forestry practice in Latvian and foreign languages, knows the latest research methodology and is familiar with modern research methods. Is capable to independently select, compile, systematize and analyze scientific information, knows the necessary methods of data acquisition, collection in forest sciences and forestry practices, as well as can choose and use various data processing and analysis methods. Is able to communicate about aspects of forest science and forestry practice with various forest sector specialists and society at large, as well as scientists and policy makers. Able to independently improve qualifications, manage research or development tasks, projects in forest sector organizations and companies. Contributes to the development of forest science in the chosen field of research, and/or provides a new understanding of existing knowledge and its application in practice, implementing original research and publishing its results in internationally cited sources, as well as preparing recommendations for forestry practice and / or forest ecosystem-related policy development. Is competent to independently prepare and substantiate solutions to complex forestry practice problems, synthesizing information from various sources, as well as to perform critical analysis of existing forestry practices and recommendations as well as research related to the forest ecosystem, bioeconomy. Able to independently develop research ideas, plan, structure and manage international and national scientific projects.</i>
Final examination upon the completion of the study programme	<i>Doctoral Thesis</i>

Study programme forms

Full time studies - 3 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>120</i>
Admission requirements (in English)	<i>Master's degree or equivalent higher education in forestry or in a related sciences</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Doctoral degree Doctor of Science (Ph.D.) in Agriculture, Forestry and Fisheries</i>
Qualification to be obtained (in english)	<i>—</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Since there had not been any student in part-time studies for 7 years, it was decided to not continue accrediting it.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

There was one student in each of 2 years of the part-time studies using this type of studies to avoid wasting time if they could not get a budget place in full-time studies in that particular year. Generally, part-time studies are not the most demanded ones, because they are paid studies only and total number of persons interested in doctoral studies in this programme is not so high, besides if we are to consider the planning and overall agenda, full-time studies can be balanced with work life. Since there had not been any student in part-time studies for 7 years, it was decided to not continue accrediting it.

The largest number of students in full-time studies was found in academic years of 2012/2013 and 2013/2014 (24 students), which is related to the scholarship programme financed by the European Union available back then; afterwards the number of doctoral students dropped by 20-25% and have remained relative stable during following years (mean 17, ranging from 14 to 21 student). Working as the level of programme director with individual doctoral students, LLU administration and scientific institutes, it was possible to ensure that several doctoral students, who had abandoned their studies or elaboration of doctoral thesis, return to their PhD studies and finish them successfully. This result is most prominent in year of 2019/2020 when there were twice as much doctoral students in the third year than a in the second year one year ago.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Title of the study programme “Forest Science” completely corresponds to its **goal** - to promote development of the forest science and to achieve qualification level by virtue of efficient

collaboration of the scientific institutions and in line with the international standards in order to create the new generation of scientists, providing opportunities for doctoral students to acquire theoretical studies of the highest level, research methods and organisational principles as well as to elaborate doctoral thesis with theoretical, practical and scientific significance for the forest sector development in sub-branches "Forest Ecology and Silviculture", "Forest Economy and Politics", "Forest Work and Machinery" in branch "Agriculture, Fishery and Forest Science" and receive internationally recognised degree Doctor of Science.

Forest industry in Latvia is important – forests cover 3,413 hectares and 53% of the territory of the State, and in 2019 it comprised 5.1% of GDP and 20% of total export value. Naturally, this industry focuses on practical research, conducted in LLU and in the Latvian National Silviculture Institute "Silava". Institute of the Forest Science is the largest employer for the Forest Science programme (since the last accreditation: 70% of alumni work there) and already during the studies many doctoral students work for it (currently 77% of programme's doctoral students).

The **qualification to be obtained** corresponds to the programme's goal, its title, indicating at one of the areas with the science branch integrated in its name ("Doctoral degree Doctor of Sciences (PhD) in Agriculture, Fisheries and Forest Science").

The programme was intended to be dynamic and to provide knowledge to doctoral students on how to reflect and research changes in the forest ecosystem and forest industry, and to cover the most topical issues in current economic and international situation.

Doctoral studies have a basic task to prepare the new scientists in order to empower them solving scientific problems relevant for the forest industry and to promote its development.

The doctoral programme aims at building comprehensive knowledge so that the doctoral students learn applying conventional and recent qualitative and quantitative methods and achieve more profound theoretical preparedness in the chosen sub-branch of science, and as a result the doctoral students:

- can acquire the theoretical course of the programme and pass doctoral examinations;
- can publish research results in top-ranking international scientific journals;
- can present research results in international scientific conferences and to make them available for general public in a readily understandable form.
- achieve high level skills in professional use of foreign languages for research and further work and international activities;
- can independently solve essential research and innovation tasks, promote new research ideas through critical analysis, evaluation and synthesis;
- can independently plan, structure and head scientific research and pursue qualification upgrade;
- can elaborate and defend doctoral thesis with theoretical, practical and scientific relevance to the forest industry.

All intended study results are directly related to future work of the study programme's alumni – in the scientific institute or university, or research and development work in a company (70%, 15% and 15% of the alumni respectively since the previous accreditation).

Admission requirements – master's degree or equivalent higher education in forest sciences, agricultural sciences, environmental sciences or biology. For students with masters degree in other sciences entrance exam can be required. The entrance exam is designed to expand the circle of interested people who want to develop a doctoral thesis in forestry. The specified additional requirements will be agreed with the Higher Education Council.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Conferring of a degree is **based on achievements and insights of the relevant science branch**, which is evidenced by alumni employment (see 1.3): all those who graduated before the previous accreditation work for a scientific institute or university, or in research and development company. None of these positions (scientific assistant - in case of doctoral students; researcher; leading researcher; university lecturer; associated professor, head of the research division) is accessible without a proper qualification and lack of knowledge of the most recent scientific findings. The Doctoral Council, which confers the degree, embraces not only LLU but also representatives from the Latvian National Silviculture Institute "Silava", National Wood Chemistry Institute of Latvia and Institute for Forest and Wood Product Research and Development, who comprise the majority of the Council, meaning that the compliance of doctoral degree applicants with the stated criteria is monitored and evaluated.

Update of the content of the specialised courses where the doctoral examination must be taken (in science sub-branch and research direction), also without making changes to the conceptual sections, takes place when creating or adapting scientific insights of the industry to Latvia's situation. Course topicality is evidenced by doctoral students' ability to publish their research findings in prominent (quoting index exceeds 50% of the industry's average) international journals, which could not be possible when working with irrelevant topics and information. For example, during last 2 years 60% of alumni chose to prepare and defend their theses as a set of publications, and the results were published in periodicals, such as Forest Ecology and Management, Scandinavian Journal of Forest Research, Forests, Silva Fennica, BioResources.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

Study programme "Forest Science" abide by the succession and logic sequence principle, taking into account the necessary preliminary knowledge (preparation), in order to successfully conduct research and elaborate doctoral thesis: therefore the special course Professional Foreign Language (important for work with the scientific literature), and Research Methodology (to prepare and

improve design of doctoral thesis) and Multivariate Data Analysis (for statistical data processing) are offered in the beginning of studies. They are naturally associated with the course Preparation of Scientific Papers, which at a later stage merge all the previous knowledge and skills: how to build research design, how to analyse and describe it in correct foreign terminology. Main part of the study process naturally involves application of this knowledge and contributes to the body of current knowledge individually – collaboration with the supervisor of doctoral thesis, preparing of publications and reports in conferences and interaction with the article reviewers, conference participants. All courses directly contribute to attainment of programme's goals, making sure that the doctoral student can independently solve important research and innovation tasks, come up with new research ideas through critical analysis, evaluation and synthesis, as well as independently plan, structure and head scientific research and independently upgrade their scientific qualification. It means that by achieving the result important for the new scientists in their future career in the scientific institutions, they will be able to prepare and conduct research.

The most important research directions where doctoral students carry out their research are related directly to LLU Strategy, Bioeconomy strategy and relevant RIS priorities and include:

- Analysis of greenhouse gas emission, coherence and influencing factors to reduce climate change (related directly to international obligations of Latvia and goals of EU in this field);
- forest adaptation and its strengthening – by evaluating consequences of various disturbances (such as storms, fires) and possibilities to decrease them (directly related to EU Biological Diversity Strategy and Forest Adaptation Strategy and national level policies);
- elaboration and introduction of remote research technology and other IT solutions – both in forest inventory (incl. evaluation of various damage) and restoration, forest management
- ecological and economical evaluation of various silviculture measures (for example, formation of mixed forest stands, protection from biotic interferences; improvement of growing conditions etc.; directly related to delivery of courses Bioeconomy development and Green course)

Impact of the programme on other education levels is ensured through participation of the doctoral students in lectures and practical work, heading of certain sections in traineeships for students from the Bachelor's and Master's programmes (one doctoral student at least in one event). Impact on the research is mainly related to participation in the research implementation and preparation of the scientific publications – hence promotion of recognisability and building of scientific capacity.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

The studies have a form of contact lessons and are organised and supervised as individual studies. Scope and requirements of delivery of each course are defined in the course programme. For the studies to be evaluated as successful, a student must master courses specified in the study programme's plan each semester. E-studies are available for acquisition of courses, and this media contains study materials, tasks, tests and serves as a communication platform between the student and academic staff members.

Large part of total study volume is directly related to the individual work of the doctoral student, abiding by student-centred education principles. Director of the study programme supervises and, if necessary, solves disputes between the thesis' supervisor and doctoral student, making sure that the doctoral student receives qualitative information, consultations and a possibility to implement his or her research and elaborate doctoral thesis. Programme's director also helps to find contact persons and involve consultants (also from foreign countries) where necessary.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

The topics of the PhD thesis correspond to the current trends of the practice and research, including current directions of development of international research. Doctoral theses are not evaluated on a graduation scale; their quality is high, which is confirmed by the acceptance of the Promotion Council - the council includes participants not only from the Latvia University of Life Sciences and Technologies, but also from the Latvian State Forest Research Institute "Silava", Latvian State Wood Chemistry Institute, Forest and Wood Products Research and Development Institute. The whole research and production cycle of the forest sector is covered in the PhD thesis: from reforestation and young stands (e.g. "Influence of stand structure and management regimes on regeneration of Scots pine (*Pinus sylvestris* L.) in continuous and group gradual felling", "Height variability of Scots spruce (*Picea abies* (L.) H. Karst.) in pure stands at the juvenile age"), thinning, final felling and timber (incl. biomass) extraction (for example, "Technological and economic solutions for mechanized energy wood preparation in commercial thinning"). Aspects related to forestry adaptation (tree species diversification, damage reduction) are analyzed, for example, "Heterobasidion-induced root rot in small-diameter coniferous trees", "Ash *Fraxinus excelsior* L. dieback in Latvia: stand succession and ash regeneration", "Norway spruce *Picea abies* (L.) H. Karst. wind resistance changes due to damage to root rot and trunk", "Regeneration and growth of European beech (*Fagus sylvatica* L.) stands in Latvia"). The development of the forest ecosystem was also assessed (incl. "Forest fire history and post-fire regeneration patterns in hemiboreal forests", "Impact of freezing rain and wind as a natural disturbances coniferous stands in hemiboreal forests of Latvia"). Political, policy and economic aspects related to forestry and wood processing have also been analyzed (for example, "Latvian Wood Industry Development Forecasting Model").

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

Director of the study programme discovers the opinion of employers in individual interviews: taking into account the employment of programme's alumni (the new scientists) – both in Latvian National Silviculture Institute “Silava” and LLU, and major forest management companies with research and development department. The opinion is generally positive and individual recommendations – for example are taken into account when updating the special course “Forest Ecology and Silviculture” of the sub-branch, including there also issues on forest adaptation. The employers' opinion is also explained within the framework of the project “Improvement of Administration of Latvia University of Agriculture”, receiving a remark on necessity to promote (increase) publishing of doctoral theses' results in scientific journals. Currently it is implemented through an option (relevant LLU regulation – “On procedure for approval of elaboration and execution of LLU doctoral thesis, thematically uniform collection of scientific publications”) where the volume of publications is specified. Doctoral students of the Forest Science programme purposefully choose this option (after adoption of regulation 60%) at the same time putting forth certain demands for publication number and quality, therefore the results are achieved (see 2.1 part).

Students have expressed their opinion about some courses, and evaluations across the years do not have any significant trend and they reach or exceed 80% (4 or more in 5-point system).

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

The mobility of doctoral students is mainly related to participation in conferences and presentation of their research results and getting acquainted with the next cooperation partners, who work in the same field. Geographic coverage of participants is wide, and mainly include Nordic countries (due to similar forest conditions), and also other European countries, Russia, Belarus and in some cases also North America (Canada, USA), South America (Chile), New Zealand. The mobility does not have any trends across the years.

In order to promote meeting and idea exchange of students (mobility), director organised one-week doctoral school in 2018 (*Forestry doctoral school 19th-22nd of June, 2017*) in Forest Research Station where forest sector doctoral students from the Baltic States participated (and presented their topics) – from LLU, Aleksandras Stulginskis University (current VDU), Lithuania, and Estonian University of Life Sciences (EMU), Estonia. Doctoral students also collectively participated in object inspection in the forest and lectures were read by specialists working for LLU, LVMI Silava and Latvian State Forests. Next year this idea was implemented by Estonian colleagues in the Forestry Conference for Baltic PhD Students, Estonia, 26-27.04.2018 with participation of doctoral students from the Forest Science programme.

Doctoral students from the programme Forest Science participate also in the courses envisaged for this study level within the framework of programmes BOVA-NOVA, for instance, “Nordic dendrochronological fieldweek 2014”, “Cross-disciplinary studies of forest adaptation to climate

change”, Latvia, LLU, 13-17.03.2017, and others, for instance, Intensive course for PhD students “Forest tree and stand growth and dynamics when analysing data”, 05-08.11.2018, SLU, Sweden etc.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

The Forest Faculty, Faculty of Agriculture, Faculty of Information Technologies and LLU Language Centre are partaking in delivery of programme “Forest Science”. Structural units involved in the programme are provided with the necessary study base, which is being constantly improved and developed. Steps are taken to modernise the premises and equipment on a regular basis, to prepare methodological materials. Two computer classes (with 50 workplaces) are available for students in the Faculty, where the computers have special forest management planning computer software installed and also software for data processing and designing. There is also a cooperation between the Latvian National Silviculture Institute “Silava” and the research base is available for implementing the doctoral studies.

LLU Fundamental Library offers its visitors various online databases (for example, CAB Abstracts; CRC Press e-books; EBSCO databases; EBSCO eBook Academic Collection; ScienceDirect journals; Scopus; Web of Science etc.) and databases in other media. The library has purchased a searching software PRIMO DISCOVERY, enabling simultaneous search in the subscribed and free online databases, electronic Joint Catalogue of national-level libraries, LLU FB databases (publications of LLU academic staff members, LLU Master Theses etc.). During the study process literature relevant for the speciality is available from the local authors, academic teaching staff and foreign authors and it is found in LLU Fundamental Library and Information Centre accommodated in the Forest Faculty.

The available resources and infrastructure meets the conditions for the implementation of the study programs and ensures the opportunity to successfully implement the study program and achieve intended goals.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

Provision of the study base is reflected in Section 3.1 and it includes equipped premises and access to the scientific literature databases and repositories. The most important scientific provision in the Forest Science programme:

- for measuring the forest area, in majority of cases it is preferable to choose ones with a known history and existing previous research objects that were maintained;
- laboratories and gauges.

Areas necessary for the research are situated in the territory of national scientific research forest management agency “Forest Research Station” owned by the Latvian National Silviculture Institute “Silava” and Latvia University of Agriculture, forest areas of which are deployed in various regions of Latvia. Goal of this agency is to provide scientific research aid to enable research support base in line with the priorities of forest industry development, giving a possibility to timely collect data and verify the scientific hypotheses in practice. The goal is to support higher education in the forest industry and continued education as well in order to upgrade the practical skills of forest students and also provide with practical knowledge in relevant demonstration objects in forests subject to national scientific research. Various research objects in the territory have been arranged since the end of the World War I, the majority of research objects arranged have been preserved since the 60s of the last century and part of them have retained the arrangement and later surveying information (data, schemes). This information gives a possibility for doctoral students to analyse long-term dynamics of various components of different forest ecosystems and thus get the scientific information at a better quality: it gives more substantiated conclusions for practice and a possibility to publish the results in higher ranking journals. Preserving of the arranged objects is ensured through sustainability of the work invested. Forest research station is also a nursery for scientific experiments where one can grow the planting material for the research needs and where controlled growing conditions can be provided (specific lighting, temperature, humidity mode) to examine issues related to plant physiology and adaptation.

Programme delivery involves cooperation with the Latvian National Silviculture Institute “Silava” where the doctoral students can look into the work of various research groups and have access to modern and equipped laboratories to perform specific analyses almost across all forest ecosystem’s components (and research areas):

1. laboratory complex with climate control option;
2. molecular biology laboratory;
3. forest mycology and phytopathology laboratory;
4. silviculture and forest resources laboratory;
5. forest environment laboratory (incl. soil, litter, analysers of various greenhouse effect gases, distant research equipment);
6. game and fauna research laboratory;
7. plant physiology laboratory.

In addition to the equipment of LLU, students can access also modern devices and sampling plots for conducting research vital for the basis in the forest science sector in relation to various components and services in the forest ecosystem.

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over

the reporting period and their impact on the study quality.

The most important changes are related to the change of lecturers in the course Research Methodology without affecting qualification (professor). Also, student feedback (quantitative evaluation) about the course remains high (did not change) after the change of its academic staff member. The change is related to retirement of previous academic staff member.

Director of the study program, involved also as a lecturer, had been changed.

Professors of the specialized courses (research field and research direction) had been changed in accordance to the results of the professor election.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Academic staff members involved in the programme “Forest Science” have suitable qualifications according to the Law on the Higher Education Institutions –(<https://likumi.lv/doc.php?id=37967>, in Latvian): 6 professors and 3 LZP experts are involved: it means highly qualified specialists whose qualifications are being regularly controlled and must be upgraded according to legislation. To this end, the academic staff members both participate in the scientific research and prepare publications and attend qualification upgrade courses/ seminars/ conferences (Science-based Forest Industry 2021, LLU Academic Conference etc.) and also special training courses to elevate pedagogic competence. Implementation of regular qualification upgrade measures and participation in them help following the latest findings in related sectors and recommendations for practical production, which serve as the basis for regular improvement of courses, so that the knowledge, skills and competences obtained in the study process correspond to the actual situation in real production circumstances.

More than 80% of total academic staff involved in delivery of the programme LLU is the primary job. They come both from the Forest Faculty and other structural units of LLU.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

In total, the number of publications of the academic staff involved in the implementation of the PhD study program in the sources indexed in the Scopus database during the reporting period reaches 262, incl. a significant part of the publications have been prepared together with researchers from other countries, within the framework of international cooperation, confirming participation in the development of the field of science on a larger scale. Publications are included in a number of the most important international scientific journals in the forest sector, incl. Agricultural and Forest Meteorology, Global Change Biology, Ecosphere, Canadian Journal of Forest Research, European Journal of Forest Research, Forest Ecology and Management, New Forests, Urban Forestry and Urban Greening, Silva Fennica, iForest, Forests, Forestry Studies, Baltic Forestry (Annex 4).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

During the reporting period, the academic staff implementing the PhD study program, as project managers/leaders or main executors / sub-project managers / leading researchers had been involved in 34 scientific projects. Their range of funders is quite wide: European-wide, like European Agricultural Fund for Rural Development (EAFRD), INTERREG, European Regional Development Fund projects (incl. Postdoctoral research support), European Social Fund project - and Latvian-wide: National Research Programs and Fundamental and Applied Research Projects of the Latvian Science Council, Ministry of Agriculture contract research, Rural Support Service projects. Examples of the projects: 1) Mixed species forest management. Lowering risk, increasing resilience (REFORM), FP7, ERA-NET SUMFOREST, participants. 2) Innovative brownfield regeneration for sustainable development of cross-border regions (BrownReg), 2018.-2019., INTERREG, expert. 3) Reduction of wind storm damage risk in private forest management. Latvia Council of Sciences, 2019.-2020., project leader and participants.

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

The academic staff is involved in the scientific research due to research programmes created by LLU, for example, programme "Strengthening of Scientific Capacity in LLU" where academic staff members and doctoral students can compete for research funding. Each year applications are submitted for projects financed by the state, EU structural funds, National research programmes, in cooperation with the academic staff members and researchers from several LLU faculties as well in cooperation with LVMI SILAVA, AS LVM and other forestry companies in Latvia, and also for transfer of theoretical knowledge in the production processes.

For example, the academic staff is engaged in international projects related to the forest industry, such as FP 7 ERA-NET SUMFOREST project "Mixed species forest management. Lowering risk,

increasing resilience” (REFORM) and European Forest Institute (EFI) project “FOSPREF-Wind – Wind risk to European forests under climate change”, expanding research related to risks of forest adaptation and possible climate changes and transferring the obtained knowledge to doctoral students both directly – involving them in research about these issues in Latvia (for example LZP research “Reduction of wind storm damage risk in private forest management”), and telling about them in field research objects and including the new insights in the course of Forest Ecology and Silviculture sub-field.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Field of forestry involves diverse topics and is actually linked to many other scientific disciplines, for example, agriculture, environmental engineering, and also information technologies. The academic staff members collaborate in preparing applications for the scientific research (for example, in LVM) which is unimaginable without statistical data analysis and calculations of different complexity levels. There is also a cooperation with the academic staff members from other institutions (Silava) and countries, for example, Estonia (EMU), Sweden (SLU) and in preparation of joint publications and applications and jointly supervising doctoral students and individual consultations (training) in the amplest part of the studies – research and elaboration of the doctoral thesis.

Mechanisms promoting cooperation is interest in implementation of joint research and preparation of scientific publications, by maintaining and upgrading individual qualification.

Student : lecturer ratio in the doctoral programme is 10.5, while academic staff load is 1.33 full-time positions.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	1_pielik_statistika_statistical-data_Mezz_PhD.pdf	1_pielik_statistika_statistical-data_Mezz_PhD.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard		
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	2pielik_Stud_kursu_plans_kartejums_Mapping_Mezz-PhD-prec.xlsx	2pielik_Stud_kursu_plans_kartejums_Mapping_Mezz-PhD-prec.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	3_pielik_Stud_pr_plans_Study-paln_Mezz-PhD_lv_en.xlsx	3_pielik_Stud_pr_plans_Study-paln_Mezz-PhD_lv_en.xlsx
Descriptions of the study courses/ modules	Study-courses_Mezzin_PhD.rar	Studiju-kursi_Mezzin_PhD.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Doktora_diploms_Mezzinatne_EN.pdf	Doktora_diploms_Mezzinatne_LV.pdf
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	dokt_stud_progr_Mezzinatne_AIP_atzinums_EN.docx	dokt_stud_progr_Mezzinatne_AIP_atzinums.edoc

Agriculture (45621)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Agriculture</i>
Education classification code	<i>45621</i>
Type of the study programme	<i>Academic master study programme</i>
Name of the study programme director	<i>Biruta</i>
Surname of the study programme director	<i>Bankina</i>
E-mail of the study programme director	<i>biruta.bankina@llu.lv</i>
Title of the study programme director	<i>Dr. biol.</i>
Phone of the study programme director	
Goal of the study programme	<i>Prepare highly qualified agricultural specialists for work in research, pedagogy, state administration, production, as well as for further studies in PhD program.</i>
Tasks of the study programme	<i>Tasks for achieving the goal of the study program:</i> <ul style="list-style-type: none"> • <i>to deepen theoretical and practical knowledge in the agricultural sector, in accordance with the chosen specialization;</i> • <i>to develop and strengthen the knowledge and skills necessary for the performance of research work, to deepen the skills of application of research methods;</i> • <i>to develop skills in the art of presentation of the obtained results;</i> • <i>to develop independent work skills to ensure further acquisition of knowledge.</i>
Results of the study programme	<i>Alumni of the academic Master programme "Agriculture" (AM):</i> <i>Are able to explain the scientific discoveries in the agricultural biology, agricultural economy and specialised courses.</i> <i>Can interpret and collect results of the scientific research, can plan the process of work and apply research methods. They can apply theoretical knowledge to evaluation and choice of the agricultural production, They have acquired teaching and consultative work skills, are able to discuss in public and engage in teamwork.</i> <i>Can integrate different fields of knowledge, contribute to generation of new knowledge. Can define and analyse scientific problems and conduct scientific research individually. They have competence to analyse situation concerning the agricultural production or public administration, and to make decisions on elaboration of a strategy and implementation of the necessary measures.</i>
Final examination upon the completion of the study programme	<i>Master Thesis</i>

Study programme forms

Full time studies - 2 years - latvian

Study type and form	<i>Full time studies</i>
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Duration in full years	2
Duration in month	0
Language	latvian
Amount (CP)	80
Admission requirements (in English)	<i>Bachelor's degree or second level professional higher education, or obtained higher education before the year 1995 (Agriculture, Forest Sciences, Veterinary Medicine, Biology). The applicants, who have obtained Bachelor's degree in other disciplines, shall take the entrance examination in "Plants and Animal Biology"</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Master Degree of Agricultural Sciences</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Parameters of the programme have not changed, however the results to be attained in the programme have been updated.

Alumni of the academic Master programme "Agriculture" (AM):

Are able to explain the scientific discoveries in the agricultural biology, agricultural economy and specialised courses.

Can interpret and collect results of the scientific research, can plan the process of work and apply research methods. They can apply theoretical knowledge to evaluation and choice of the agricultural production. They have acquired teaching and consultative work skills, are able to discuss in public and engage in teamwork.

Can integrate different fields of knowledge, contribute to generation of new knowledge. Can define and analyse scientific problems and conduct scientific research individually. They have competence to analyse situation concerning the agricultural production or public administration, and to make decisions on elaboration of a strategy and implementation of the necessary measures.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Number of persons studying in the Master programme varied between 21 and 42 (Annex 2). Changes in number of students are largely affected by the changes in number of alumni of the undergraduate study programmes and discontinuation of the Professional higher education Master programme "Agriculture" (code 4562100).

The rapid increase in number of students in the academic year of 2015/2016 is due to the fact that in 2014 the students received their professional Bachelor's degree for the first time, and hence all alumni qualified for matriculation in the academic Master programme and students were no longer admitted to the professional Master programme. Decrease in number of students during recent years is related to smaller number of students in the undergraduate studies.

Proportion of the MA students who study in the budgetary places has varied from 58% (in the year of the largest number of students and accordingly the fiercest competition for the budgetary places, therefore MA students with relatively good average grades had to pay for their studies) to 100%. In recent years 100% of students had budgetary places, because MA students had passing

grades and the number of students did not exceed the number of budgetary places.

Master studies have gender balance, even though male-female ratio has changed from year to year.

Slightly over one half of those who were admitted to Master studies, i.e. 54%, graduate, and this number also change from year to year.

The main reason to discontinue studies is failure to balance work and studies. Alumni of the professional Bachelor programme are highly demanded in the labour market. Employers (except for the scientific institutions) do not demand staff to hold a Master's degree, therefore one can find a well-paid and interesting job in current labour market situation also without the Master's degree. A survey conducted by the company "Dynamic University" found that demand for highly qualified agriculture production specialists is not expected to increase. Master studies are necessary to prepare few highly qualified leading employees and future doctoral students, because the number of persons holding a doctoral degree in agriculture science disciplines should be increased. Unfortunately, doctoral studies and further academic career is not of interest for majority of alumni, because scientific and educational institutions cannot offer competitive salary. Persons who are aware of the role of knowledge and development possibilities choose to study in the Master programme and to graduate from it, and these are few persons working for the scientific institutions and also those who wish to get the agricultural education after graduating from another basic discipline.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Coherence of study programme's name, degree to be obtained, as well as goals and tasks and admission prerequisites has been examined in more detail when elaborating the programme in 2010, it was regularly assessed in delivery period and reviewed in 2019 after a project "Improvement of Administration of the Latvian University of Life Sciences and Technologies", implemented by LLU within the framework of the project No. 8.2.3.0/18/A/009, where the industry experts were involved in assessment of programmes ("Provision of industry expert services for assessment of programme content and provision of recommendations within the framework of the project No. 8.2.3.0/18/A/009").

The attainable study results reflect the consistency and implementation of the study program's name, objective, and tasks. In the Master's study program "Agriculture", study objective is to prepare the leading specialists in production, state administration, and research, which defines setting of the accomplishable tasks and attainable results. The attainable results include the knowledge in latest trends in both production and science. Much attention is paid to presentation and discussion skills, and to abilities and competencies related to information analysis and critical thinking.

Courses were examined according to the procedure set by LLU, which led to updating of attainable results and requirements for credit points.

Academic Master programme "Agriculture" (Education classifier of the Republic of Latvia - 45621) complies with the Regulation of the Cabinet of Ministers on academic education standard:

<https://likumi.lv/ta/id/266187-noteikumi-par-valsts-akademiskas-izglitiba-standartu> (only in Latvian).

Master's degree studies provide students with a deeper theoretical knowledge in agricultural sphere, which cannot be acquired without the basic knowledge in biology; this is why the exam "Plant and Animal Biology" is required. This examination offers minimal preliminary knowledge for those students who have acquired education in another branch in their basic studies, and allows successful mastering of knowledge in the chosen speciality.

Admission requirements for the Master's study program, including an entrance examination for applicants who have acquired their prior education in other research branches, have been set already in the preceding accreditation in 2013 (accreditation report is available at https://www.llu.lv/sites/default/files/files/lapas/Studiju_virziena_PZ_Lauksaimnieciba_2013_2014.pdf, only in Latvian) and the requirement for an entrance examination is mentioned on page 74 of that report. This is the reason why additional coordination with the Council of Higher Education has not been made.

Goal of the Master programme "Agriculture" is to prepare the leading specialists both in agriculture production and public administration and science; programme's tasks and learning outcomes are aligned with that goal. Learning outcomes include both knowledge on the latest trends in the production and science, Large attention is paid to skills and competences related to information analysis as well as presentation and discussion capacities.

Admission requirements, i.e. exam "Plant and Animal Biology" ensure minimum grounding for those who have graduated from another discipline, to enable successful acquisition of advanced knowledge in the selected field.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Study content is created taking into account the trends of agriculture science and necessity to learn communication and other skills to achieve the proposed goal - prepare highly qualified managers, specialists or future scientists.

According to the internal legislation of LLU, the course programmes are reviewed and updated at least biannually, adding the most urgent topics and issues.

Theoretical and specialisation courses allow mastering of the scientific findings and at the same time follow-up the recent topics of the industry.

Course content is updated on a regular basis, taking into account the opinion of both students and experts. Various surveys are conducted:

- course and programme assessment in LLU Information System where the MA students can evaluate content of courses, lecturing methods and express an opinion;
- the faculty prepares alumni questionnaires.

Scientific findings can be integrated into the programme content due to competence of the university teachers and visiting lecturers. All university lecturers of theoretical courses are also the leading researchers actively conducting scientific research. Visiting lecturers (leading researchers and professors) are invited from the scientific research institutes in Latvia and abroad. Each academic year foreign professors give lectures with volume of 1 CP. Academic staff members and visiting lecturers who work with MA students are supervisors of the scientific projects of various levels or leading executives, and therefore they bridge the scientific findings to the course content. A link to the industry is enhanced by participation of the academic staff members in the work groups of ministries (mainly the Ministry of Agriculture) and other expert groups, as well as in industry associations and other non-governmental organisations. Academic staff members participate with their reports in international and local conferences and seminars and therefore courses are updated in line with the scientific trends and topicalities in the production.

The programme was analysed within the framework of the project No. 8.2.3.0/18/A/009, with participation of the leading researchers from the scientific institutions in Latvia as experts (Institute of Agricultural Resources and Economics, Institute of Horticulture) and the leading researcher and professor from Helsinki University. In general, the programme was praised, it lives up to similar programmes offered abroad. Content of individual courses has been updated according to the experts' recommendations.

The final examination in the programme is Master Thesis (25 CP), which is the result of independent research in a particular direction of the science of agriculture. The thesis includes both literature review where the latest scientific findings are collected and analysed about the research topic, and research section for elaboration of which experiments and/or observations are made in line with the methodology of relevant direction. The results obtained are analysed, interpreted and research-based conclusions are made. The high level of Master Thesis is maintained by the chosen topics, because the major part of them is involved in some wider project (projects ordered by ERAF, LZP, ZM and others). The Master Programme Examination Commission (MEK) regularly gives feedback on good scientific level of the research and also marks that literature reviewing skills have improved.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

Acquisition of the courses allow attaining the study outcomes specified in the programme. The programme has been designed to build more advanced knowledge in the general theoretical courses (Agricultural Biology, Research Methodology, Preparation of Research Reports) and economics (Investments in Agriculture). Specialisation courses depend on the selected study

direction, their content involves recent scientific findings and research results. It allows students to acquire not only knowledge, but also skills related to information sourcing and analysis, and they also skilfully link theoretical findings to actual production and the newest technologies.

Course mapping reflects compliance of the learning outcomes of each course with the goals and results of the programme (Annex 5).

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

A special attention in the Master programme is paid to the student-centred education, because students have different background of knowledge and skills. Study methods are chosen to help each student to achieve learning outcomes of the programme.

Courses include lectures, seminars, laboratory work and activities in the production companies. Individual work is mandatory in all courses and it includes laboratory work, practical work and literature review, allowing to learn research methods and enhance the skills of working with the scientific literature. Presentations prepared by the MA students for the courses create a platform for developing discussion and argumentation skills.

Various internet platforms are used in the study process. Moodle platform, which is being constantly improved, has become widely used in LLU. Academic staff members upload study materials, provide instructions for students regarding acquisition of courses, tasks for independent work, questions for self-learning and tests, and they use this platform also to communicate with students. Increasingly more distant learning elements are being introduced, especially since spring of 2020. In the new reality of Covid 19, the academic staff members provide video lectures, which can be viewed again, they organise seminars and discussions, course work and traineeship presentations. Covid 19 has made academic staff members to considerably improve their IT skills, and also infrastructure related to use of the internet platform has been improved.

Assessment methods correspond to the principles stated in the Regulation of the Cabinet of Ministers (Regulation on National Academic Education Standard).

(1) Open assessment principle - the common principles are described in Study Regulation of LLU (<https://www.llu.lv/en/study-guide-documents>). Certain valuation methods for each course are clearly defined in the course programme, which is published in LLU information system (IS).

(2) Compulsory assessment principle - a student must have passing grades in all courses in order to get the Master's degree in agriculture.

(3) Principle of possible review of the assessment - the main principles are provided in the Study Regulation, however the university teacher informs about particular tests (Pass/Fail tests, tests etc.) at the beginning of the studies and publishes it in e-studies.

(4) Principle of variety of tests and exams used in the assessment. Assessment of the courses is mainly cumulative - the assessment consists of a special examination or a test, and also assessment of tasks, tests or presentations during the semester. A separate assessment is given to

individually elaborated and presented work or a report on the work according to rules published in e-studies. In order to promote student involvement in the study process, the students participate in the assessment of some tests, for example, they evaluate the quality of peer presentations.

All courses are student-centred.

- results of the course are clearly defined and students are aware of them; if necessary, academic staff members work individually to help attaining the learning outcomes - recommend additional literature, organise individual consultations, especially if the education background of the student was not related to agriculture.
- The MA students know and understand the defined study results (both those of the programme and the course);
- assessment of learning outcomes is designed to allow checking whether and at what level the learning outcomes are attained.
- The study process focuses on a student who can study independently.
- one can understand how the set of individual courses lead to outcomes of the programme;
- an academic staff member must promote the education process to allow student attaining the learning outcomes;
- at the end of the course the students provide their evaluation of the course mastered.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

During the research traineeship “Agriculture” (the volume of practical training is 6 CP, and it is accomplished in the 3rd semester), the MA students learn more about activities of the scientific institutions and scientific research, and also improve presentation and organisational skills. It allows students conducting individual research and consultative/teaching work. These outcomes correlate to total results to be attained in the programme - scientific work planning skills, application of scientific methods as well as teaching and consultative work skills.

If necessary, the program’s director and/or subbranch supervisors help students choose the most suitable place for practical training to be able to accomplish the envisaged program. During practical training, the supervisor of the Master’s thesis follows the performance of training and is responsible for the involvement of the student in activities favoring the acquirement of his/her practical skills (trials, field days, exhibitions, etc.). Some part of practical training is often done at the Institute of Soil and Plant Sciences or at the Institute of Animal Sciences, in order to offer students a possibility for participation in delivery of study courses and/or in preparation of study materials.

Since this is a scientific traineeship, the students participating in it are mainly assigned to the scientific institutions, and part of the traineeship may take place in other organisations of the cooperation partners, including project partner organisations, for example - Latvian Rural Advisory and Training Centre, Farmers Saeima, etc. Traineeship goal is to learn various experimental methods, approaches, organisation of research, methods of collecting different experiment/observation/data as well as building of skills necessary when using different equipment and software. Students become familiar with the structure of the scientific institutions, procedure of

project preparation and application submission and funding attraction possibilities.

In the traineeship the students can fine-tune their teaching skills – students supervise laboratory work of the Bachelor programme students, prepare and read some lectures and participate in elaboration of the methodological materials. Lectures are read both within the framework of the courses and seminars to the producers and within the framework of the Field days (trial visit).

While in traineeship, the students participate in organisation of seminars and different events (field experiments and demonstrations, exhibitions etc.).

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

Topics of the theses cover wide scope of subjects concerning the science of agriculture, they correspond to the priority research directions defined in LLU strategy. In agriculture and horticulture fields it is mainly related to the sourcing of quality products, drawing a special attention to reasonable use of natural resources, for example, optimal use of fertilizer and/or pesticides. Part of the research is connected to study of microorganisms and invertebrates crucial to agriculture as well as possibilities to grow relatively new crops, such as soya. Possibilities offered by the precision technologies are also evaluated in the theses both regarding the plant and animal production. Master Theses focusing on animal husbandry mainly look at the breeding and selection of milk and meat cattle, and also sheep and goats. Factors influencing longevity of milk cows and inbreeding and size of efficient population in local endangered cow populations are explained, and intensity and meat quality of pure-bred and various interbred in Latvia is viewed. Individual Master Theses are devoted to the analysis of productivity aspect in the alternative animal husbandry branches, such as deer breeding and rabbit breeding.

Students' theses are elaborated:

- within the framework of the scientific projects, both in LLU structural units (Faculty of Agriculture, Research Institute of Agronomy, Institute of Plant Protection Research, and Institutes of Agricultural Resources and Economics and Horticulture).
- in particular farms or companies.

The students are involved in realization of projects of different levels both as the scientific assistants and volunteers. The students have participated in the implementation of projects of the 7th framework programme and projects funded by LZP and cooperation (EFLA) projects.

Master Thesis may have two supervisors or advisers may be invited both from LLU academic staff members and leading researchers of the scientific institutes.

Elaboration of the Master Thesis is divided into three stages, which ensures good quality of the paper. Once the thesis is submitted, it is reviewed by two qualified academic staff representatives with a doctoral degree, and they provide an opinion on the quality of thesis and readiness to be defended.

The Master's thesis is evaluated as "Passed" or "Not passed". Each year, Master examination commission acknowledge that some papers should be particularly recognized –in the survey period,

23–33 % of the total number of defended theses are evaluated as excellent and are further proposed for different competitions, for example, for ALTUM Award, for the LLMZA and the Latvian Academy of Sciences Young Scientists Awards.

Master Examination Commission (MEK) has put a special emphasis on topicality of the theses for the industry and/or scientific significance and practical use.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

During implementation of the programme there were several surveys carried out: a survey at the beginning of studies (organised by programme director); evaluation of individual courses, which can be filled out in LLU Information System at the end of each semester; and also alumni and employers' surveys.

The average evaluation of the programme, which is filled out in LLU IS, from the perspective of students by years, vary (3.7-4.7) around 4.1. (evaluation scale 1-5). Unfortunately, since the students are not very active in providing their feedback, the methodological commission has prepared questionnaires that are offered to the students after defending of their theses. These surveys have brought similar results. The MA students praise general atmosphere, cooperation with university teachers and supervisors of the Master Thesis, and there are no crucial shortcomings noted. However regarding the programme content the proposals and evaluations are very controversial – some students seek more advanced programme content with included molecular biology, for instance, while others want more emphasis on practical agriculture classes.

The contents of study courses is being improved and updated according to the desires of students and the requirements of the branch. For example, to extend the understanding of the chemical composition of animal produce (milk and meat), the physiological and environmental factors affecting it, as well as the importance of chemical composition in the production processing, two new study courses – “Meat Production Technology” and “Milk Production Technology” – were designed, replacing the previous study course “Quality of Products of Animal Origin”. If the designing of a new course is not possible, the contents of existing study courses is improved. For example, the study course “Pests and Pathogens of Crops” comprises also the theme of genetic and biochemical basics of the interaction of plants and pathogens.

In order to meet the wishes of students in this narrow field, we offer to elaborate a final paper on the topic of their interest.

Employers have been surveyed as well, although it is difficult to get an impartial opinion, because only few alumni with the Master's degree work in the particular enterprise. All employers admit the theoretical basis to be very strong, in some cases they note absence of practical skills that are necessary in certain company.

When starting the programme, more than a half (54%) admit that they study pursuing their interests in this field and also a wish to upgrade their competitiveness in the labour market. The MA students find majority of courses (with only few exceptions, which change from year to year) to be interesting and necessary.

The surveys also require individual assessment for each course and quality of lectures. The

evaluation, in general, is very good, mostly exceeding four points out of five.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

Mobility of students during master studies is low, part of students has started their careers in parallel to studies and do not wish to leave them. For those whose undergraduate education was not related to agriculture and who wish to obtain more theoretical and practical knowledge, they are aware that LLU is the best place to achieve it.

However, there are students who use the benefits of ERASMUS+. During the report period two MA students participated in ERASMUS+ exchange programme. One semester was spent in the University of Agriculture in Poland, Krakow mastering the special courses. The student obtained the highest level possible - A. Other MA student was in the traineeship in Denmark, University of Aarhus, Agroecology Department, in the centre of Flakkeberg, and also took one exam in the summer school. Feedback from the traineeship supervisor was excellent both in terms of knowledge level (exam passed with A) and readiness to study and do the research independently.

Assessing the mobility of incoming students, one master's student from the Slovak University of Agriculture has been an internship at the faculty within the ERASMUS + exchange program.

As part of the ERASMUS + exchange program, one master's student from the Slovak University of Agriculture has been an internship at the faculty. Within the framework of the ERASMUS KA program, in the reporting period we enrolled 6 master students (Kazakhstan, Ukraine, Russia) and a group of 15 master students from Kazakhstan - in practice.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Number of study places from the public funding are stipulated in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Agriculture (LLU). It is defined in the trilateral contract on funding for 2020 year that the basic costs of one study place is 1,518.98 EUR, study level ratio for Master programmes is 1.5 and social provision of the study place for Master programme is 164.34 EUR, study cost ratio in education in

the thematic area for Master programme “Agriculture” is 1.8 (ratios for each thematic education area vary, they are stipulated in the Regulations of the Cabinet of Ministers “Procedure according to which the higher education institutions and colleges are financed from the state budget”), costs per one student of the Master programme “Agriculture” is 4,264.88 EUR. In 2020, the proportion of costs for the Master programme “Agriculture” comprises: salaries –76%; scholarships – 6%; products and services – 15%, incl. utilities – 6%; building of the fixed capital – 3%.

Public funding does not cover the costs necessary for the research performed for the Master Thesis. However, the quality of the research is maintained due to participation in the projects implemented in the faculty (approximately 50%), large part of works is elaborated in the scientific institutes or proprietary study and research farms.

Information about the conformity of the informational and material and technical base is available in Section 2 Chapters 3.2. and 3.3. of the Description of the Study Direction, and in Chapter 3.1. of the Professional Bachelor’s Program “Agriculture”.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

During the reporting period the composition of academic staff members has not changed significantly. Several professors and leading researchers have retired. At the same time academic staff members who have developed their qualification and obtained experience – associate professor and assistant professor, as well as associate professors who started teaching after their careers in the manufacturing sector of other scientific institution – started teaching to the MA students. It does not have a significant bearing on the study quality, because change of generations is gradual. We believe that it increases step by step, because academic staff members with diverse experience enrich the studies. In order to ensure growing number of the new university teachers coming to teach MA students, laboratory works (supervised by the leading teacher) are led by current doctoral students.

Guest professors from the EU universities (at least in 1 CP each semester) and leading researchers from the Institute of Agriculture Resources and Economics and Institute of Horticulture also read lectures to the MA students.

4.2. Assessment of the compliance of the qualification of the teaching staff members

(academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Qualification of academic staff members comply with the Law on Higher Education Institutions, the leading teachers of the Master studies hold a doctoral degree. Only academic staff members holding a doctoral degree and working also as the leading researchers deliver the theoretical basic courses in the field and specialised courses in the academic Master programme "Agriculture".

27% of the workload in delivery of academic Master programme is taken by the professors and visiting professors, 19% - associated professors and 22% - university lecturers. Some university lecturers who do not have a doctor's degree read lectures in the elective courses (such as Rhetoric) and participate in preparation and implementation of the special courses under the supervision of the leading lecturers.

Professors, associated professors and university lecturers are elected according to the criteria stated in the Cabinet Regulations.

University lecturers upgrade their qualification on a regular basis. Qualification development of teachers in teaching courses is mandatory once in every six years. Academic staff members attend also other courses - improve their English skills, and also attend courses related to the advanced mastery of new technologies, such as "Dynamic and Active Presentation", "Cloud Services for Data Storage and Sharing" etc.

University lecturers growth their qualification also through participation in international conferences with their reports, and also through participation in other type of mobility. University lecturers widely use ERASMUS+ programme, within the framework of which they do the internship or read lectures in other universities.

The lecturers take part in the implementation of different-level projects and in the preparation of scientific publications (for information see Chapter 4.5. and persons's CV). This ensures the revision of the contents of study courses and the incorporation of latest research findings in study courses, as well as the conformity of the themes of Master's theses to the topicalities of research issues, which in its turn ensures that graduates are competent in topical research findings and participate in the creation of new knowledge. On the other side, the realization of applicable projects ensures the involvement of teaching staff and students in the solution of problems urgent for the branch.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

The academic staff is involved in projects of various levels - Horizon 2020 (for example, The Data Driven Dairy Decisions for Farmers, 4D4F), 7th Framework Programme (for example, Enhancing of legumes growing in Europe through sustainable cropping for protein supply food and feed, EUROLEGUME), projects funded by the Latvian Science Council (for example, Method of increasing the physiological active compound in vegetables grown in Latvia in the changing climate conditions), projects financed by the European Structural Funds and ordered by the ministries (especially the Ministry of Agriculture). The list of projects implemented by the academic staff of the Faculty of Agriculture can be found in Annex 4 of the doctoral study program report.

The quality of publications by teaching staff has significantly improved in the survey period. For example, research papers by the teaching staff have been published in the leading branch journals - "European Journal of Agronomy", "Photosynthetica", "Agriculture", "Frontiers in Plant Science", etc.

Also, the best students are involved in the preparation of publications, and they are co-authors of both national and international scientific publications. Several Master's students have been co-authors of research publications in indexed journals, for example, papers regarding plant diseases (for example, Effects of soil tillage and crop rotation on the development of wheat stem base diseases), vegetable physiology (for example, Changes in the biochemical composition of tomato fruit under the influence of illumination quality), livestock breeding, nutrition etc. (for example, Effect of sex and age on beef cattle meat pH; Effect of concentrate feeding technology on nutrient digestibility in Latvian dark-head lambs) for information about these publications, see academic staff CV's involved in study program).

Research results are used to prepare for lectures, and students are involved in implementation of projects as volunteers (if they elaborate their Master Thesis in this project) or according to an employment contract as the scientific assistants. Correspondingly, the MA students participate with their papers in the scientific conference "Students of Their Way to Science" and also conference "Diverse Agriculture" organised for students and MA students by the Faculty of Agriculture. The best students are involved also in preparation of publications, and they are co-authors both in national and international scientific publications.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

In total 37 university lectures are engaged in delivery of Master studies, 3.79 PLE in total, and student-university lecturer ratio is eight students per one academic staff member.

The content of courses is discussed in the Methodological Commission of the Faculty, followed by further discussions in the institutes of relevant profile under the auspices of the Faculty of Agriculture, and finally approved in the Council of the Faculty of Agriculture.

Courses are interrelated as students acquire general theoretical courses during the first year (for example, Agricultural Biology, Precision Agriculture) as well as compulsory courses who pave the road to further studies (such as Plant Genetics and Breeding or Animal Genetics and Breeding) according to the study direction. In the 2nd year the students acquire elective courses depending on their specialisation, research discipline and interests of the MA student, for example - Cattle Breeding, Introduction into Population Genetics, Pests and Pathogens of Crops etc. The research traineeship strengthens the theoretical knowledge, research and teaching work skills. Mapping of the courses allow aligning the learning outcomes from certain courses with common results of the programme (Annex 5).

Academic staff members cooperate within the framework of one course (for example, "Biochemical and Physiological Aspects of Animal Nutrition" is delivered by two university teachers from the Faculty of Agriculture and Faculty of Food Technology). Cooperation is necessary to prevent content overlapping and to cover all questions not discussed, yet important for achieving desirable learning outcomes.

Academic staff members cooperate also during elaboration of the Master Thesis, because when studying a topic in the horticulture, for example, plant protection efficiency is also relevant. This is where coordination between methodological parts takes place and the student has access to consultations with other university teachers.

All academic staff members involved in the research traineeship and defence of the Master Thesis participate in said activities and evaluate the learning outcomes. So, in future work (course lectures, organisation of practice, elaboration of Master Thesis) the aspects requiring more attention are emphasized.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	2_annex_Statistical_data_EN_prec.pdf	2_pielik_Studējošo statistika LV_prec.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	1_annex_Compliance_to_state-educ-standard_en_prec.pdf	1_pielik_Atbiļstība-valsts-standartam_lv_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	5_annex_Mapping of results EN.xlsx	5_pielik_Rezultatu kartesana LV.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	3_annex_Plan of studies EN_prec.pdf	3_pielik_Studiju plans LV_prec.pdf
Descriptions of the study courses/ modules	Study courses description EN.rar	Studiju kursu apraksti LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikums-Mag_en.rar	Diploms-un-pielikums_Mag_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU aplikinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU aplikinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU aplikinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	mag_stud_progr_Lauksaimnieciba_AIP_atzinums_EN.docx	mag_stud_progr_Lauksaimnieciba_AIP_atzinums.edoc

Agriculture (51621)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Agriculture</i>
Education classification code	<i>51621</i>
Type of the study programme	<i>Doctoral study programme</i>
Name of the study programme director	<i>Aleksandrs</i>
Surname of the study programme director	<i>Adamovičs</i>
E-mail of the study programme director	<i>aleksandrs.adamovics@llu.lv</i>
Title of the study programme director	<i>Dr. agr.</i>
Phone of the study programme director	
Goal of the study programme	<i>The aim of the Doctoral Study Program "Agriculture" is to educate the new generation of scientists for dealing with the scientific problems of agriculture, obtaining more profound theoretical knowledge and acquiring the research methods, to provide doctoral students with opportunities to acquire the highest level of theoretical knowledge and research work methods, and principles of scientific work organization, to develop a doctoral thesis and to obtain a doctoral degree in agricultural sciences in accordance with international requirements, to prepare the young generation of scientists for work in solving agricultural scientific problems.</i>
Tasks of the study programme	<i>To facilitate qualitative research and drawing of new scientific knowledge in crop production, fruit growing, market gardening, ornamental horticulture, grassland management, plant breeding, biotechnology, phytopathology, agricultural entomology, plant protection, soil science, agrochemistry, field-crop cultivation, rearing and breeding of animals, animal feeding, technologies for producing animal husbandry products; To ensure the publicity of research results and the development of a Doctoral Thesis; To acquire the principles of and skills for the organization of scientific and pedagogical activities; To facilitate the integration of doctoral students into the international academic community.</i>

Results of the study programme	<p><i>As a result of the implementation of doctoral theoretical studies and the process of scientific work, scientists and highly qualified specialists are trained, who have acquired in-depth knowledge in agricultural sciences (plant and animal science) and scientific methodology.</i></p> <p><i>Doctoral students acquire skills to independently conduct and manage scientific research, prepare project applications, acquire team management skills, are able to join scientific project research groups in Latvia and abroad, are able to present research results at international and national scientific conferences. They acquire the ability to prepare internationally recognized scientific publications, are competent to constantly solve scientific problems in agriculture, formulate basic research questions and put forward hypotheses, discuss it at the national and international level, work in scientific or higher education institutions, holding academic or administrative positions in public administration and agricultural production, are able to create new knowledge in the agricultural sector and contribute to its original development.</i></p> <p><i>Doctoral students can competently engage in pedagogical work in the preparation of young scientists. Theoretical acquisition of the study program and elaboration of the doctoral thesis ensures the achievement of the mentioned study results.</i></p>
Final examination upon the completion of the study programme	<i>Doctoral thesis</i>

Study programme forms

Full time studies - 3 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>120</i>
Admission requirements (in English)	<i>Master's degree or equivalent higher education in agriculture or a related sub-branch of science</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Doctoral degree Doctor of Science (Ph.D.) in Agriculture, Forestry and Fisheries</i>
Qualification to be obtained (in english)	<i>-</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Full time studies - 3 years - english

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>english</i>
Amount (CP)	<i>120</i>

Admission requirements (in English)	<i>Master's degree or equivalent higher education in agriculture or a related sub-branch of science. At least B2 level of English language skills</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Doctoral degree Doctor of Science (Ph.D.) in Agriculture, Forestry and Fisheries</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Full time studies - 3 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>120</i>
Admission requirements (in English)	<i>Master's degree or equivalent higher education in agriculture or a related sub-branch of science</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Doctoral degree Doctor of Science (Ph.D.) in Animal and Dairy Science</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Full time studies - 3 years - english

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>english</i>
Amount (CP)	<i>120</i>
Admission requirements (in English)	<i>Master's degree or equivalent higher education in agriculture or a related sub-branch of science. At least B2 level of English language skills</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Doctoral degree Doctor of Science (Ph.D.) in Animal and Dairy Science</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Parameters of the study programme have not changed since the last accreditation.

According to the Cabinet of Ministers Regulation No. 49 "Regulation on Latvian scientific branches and sub-branches" doctor of science (pH. D.) is conferred in Agriculture and Fishery Sciences, Forestry or Doctor of Science (Ph. D.) in Animal and Dairy Science <https://likumi.lv/ta/id/296661-noteikumi-par-latvijas-zinatnes-nozarem-un-apaksnozarem> (Latvian only)

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Person's wish to study in doctoral programme is affected by several factors related to funding, such as availability of scholarship and its amount, possibilities to attract various private or investment funds, as well as situation in the agricultural sector and country in general.

Number of doctoral students varies between academic years of 2013/2014 and 2020/2021 In said period, 36 students were admitted to first year of doctoral studies, the largest number of persons admitted were in 2013/2014 - 12 persons altogether. Over the next years, between 2014/2015 and 2020/2021, the number of persons admitted by years was considerably less, 24 in total. 83.3% of persons admitted to the doctoral studies of LLU Faculty of Agriculture were women (Annex 1). Implementation of the doctoral study program "Agriculture" in English is planned after accreditation. So far, it is not offered in English, so the analysis of the number of students for the reference period has not been performed.

Doctoral programme was implemented only as full-time studies. Students do not choose part time studies due to financial considerations, because it entails study fee, accommodation fee during the studies, vacation and costs required for the research that are quite large.

When evaluating the availability of the scholarship, the study programme "Agriculture" offers 6 budget places (25 budget places altogether) during the first year, at the amount of 113.83 EUR per month, nevertheless it is not sufficient for students to not work and devote all their time to studies. For a comparison, between 2009 and 2011, doctoral students of LLU had the support programme "1.1.2.1.2. Support in delivery of doctoral programmes". Students with good study results qualified for 800 LVL (1138.30 EUR) targeted scholarship per month and up to 1000 LVL (1422.87 EUR) for business trips annually.

Since the academic year of 2014/2015, all budget places were filled only in the academic year of 2017/2018. Persons admitted to studies later are fewer in number, whereas no students started doctoral studies in the academic year of 2019/2020. It could be because persons working for the governmental bodies do not need a doctoral degree, whereas the salaries in the scientific institutions, if compared to agricultural product manufacturing sector, is not competitive.

Number of students in further courses is not related to the number of persons admitted to the first study year, part of doctoral students discontinue studies, part of them take the academic leave of absence and some of them return to studies. The largest number of students in the programme was in the academic years of 2013/2014, 2014/2015 and 2017/2018 – 32, 29 and 27 respectively.

Full-time studies last 3 years, which is not enough to conduct research for at least 2-3 years and obtain confirmatory results for a credible interpretation. In order to continue the research, majority of doctoral students take two academic leaves of absence. Number of persons engaged in active studies in year of 2019/2020 was less than persons in the academic leave of absence, 7 and 9 respectively.

List of programme students, topics and supervisors of the doctoral thesis in 2020/2021 can be viewed in Annex 5. Topics of the doctoral theses prove that lately there is a spike of interest in causes of plant diseases, factors influencing formation of crop yield, whereas in the animal science disciplines – about problems and solutions in horse husbandry and sheep husbandry sector.

Insufficient number of persons admitted to the doctoral studies, discontinuation of studies and limited financing has affected the number of defended doctoral theses. 15 doctoral theses have been defended during last 7 years. List of names of doctoral programme's students, topics of theses and their supervisors can be viewed in Annex 5. The largest number of theses were defended in 2016 and 2018 (4 in each), but none was defended in 2019. From the theses defended in 2016, one was related to field crop cultivation, two with horticulture sub-branch and one with animal and dairy science branch. Three from the theses defended in 2018 were related to field cultivation and one with horticulture sub-branch. From the persons who obtained a scientific degree during the reporting period, six (40%) are academic staff members from LLU Faculty of Agriculture.

38 doctoral students were disqualified from the studies in the reporting period, and some of them had started their studies before the year of 2013. Absolute majority (34) were counted out due to end of the study period, one was discharged due to failure to perform the contractual liabilities, one student left studies at own will and two did not return from the academic leave of absence (Annex 1).

Doctoral studies broaden students' horizon, enhance their independence, decision-making ability and teach to be liable for their consequences, however development potential of scientific research in Latvia is limited. In the year of 2019, it was found in a survey conducted by the company “Dynamic University” that demand for highly qualified agriculture manufacturing specialists is not expected to increase. Specialists with a doctoral degree are demanded only by the scientific institutions (Law on Scientific Activity) <https://likumi.lv/ta/id/107337-zinatniskas-darbibas-likums> (Latvian only). Specialists working for another institutions, such as ministries and advisory services, are not subject to such requirements.

Alumni of the doctoral programme are competitive in the labour market and may take the leading positions also in other jobs. The alumni can work at:

1) Scientific institutions in Latvia:

LLU Faculty of Agriculture, LLU supervisory institutions such as Institute of Agroresources and Economics, Horticulture Institute, LLU Scientific Institute of Plant Protection (Agrihorts), LLU

Agriculture Institute, SIA Latvijas augu aizsardzības pētniecības centrs (Latvian plant protection research centre), Scientific Institution of Food Safety, Animal Health and Environment BIOR etc. as well as in the scientific institutions abroad.

2) Educational Institutions: Latvian University of Agriculture, University of Latvia, colleges and vocational schools, foreign educational institutions.

3) Institutions related to elaboration and implementation of legislative documents in agriculture, consultations: Ministry of Agriculture, organisations specialising in pureblooded animal husbandry, Latvian Rural Consultation and Education Centre and elsewhere.

In order to involve doctoral students and new scientists in the scientific activity, thus preventing discontinuation of studies, LLU implements several internal research projects (Strengthening of the scientific capacity in LLU; conducting of basic research in LLU; delivery of LLU research programme). Researches from LLU Faculty of Agriculture involve both doctoral and master programme students in elaboration of projects to an extent possible, thus providing data necessary for their theses.

Industry and foreign experts recommended to extend the study period until the doctoral studies to 4 years, which would allow conducting an in-depth research of a particular problem and hence to prepare publications for peer-reviewed journals. Experts' recommendation cannot be solved merely with a resolution of LLU management, it must be done at governmental level.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Coherence of study programme's name, degree to be obtained, goals and tasks, study results and admission prerequisites has been examined in 2019, within a framework of a project "Improvement of Administration of the Latvian University of Agriculture", implemented by LLU within the framework of the project No. 8.2.3.0/18/A/009, where industry experts were involved in the assessment of programmes ("Provision of industry expert services for assessment of programme content and provision of recommendations within the framework of the project No. 8.2.3.0/18/A/009"). Experts' opinion - name, goal and tasks of the programme are corresponding.

Agriculture industry is one of the basic industries of Latvian economy. Name of the doctoral programme "Agriculture" clearly points at the range of issues dealt by the doctoral students when elaborating their theses. Also priority research directions defined in the Development Strategy of LLU, implemented by the Faculty of Agriculture, are closely linked with topics of doctoral theses:

- Studies of soil and land as basic resources for agriculture.
- Research of important microorganisms and invertebrates in agriculture.
- Improving plant productivity and yield quality through environmentally-friendly technologies.
- Improving animal productivity and functional efficiency.

Goal of the doctoral programme is to bring to doctoral students the highest level theoretical knowledge and research work methods, principles of organisation of the scientific work, elaboration of the doctoral thesis and to obtain doctoral degree in line with the international requirements (Ph. D) in agriculture, forestry and fisheries or animal and dairy science. To prepare the new generation

of scientists to solve scientific problems in agriculture.

Tasks defined in the programme are aimed at achieving the goal, deepening the theoretical knowledge and practical skills of foreign language (English), research methodology, mathematical processing of data and industries related to the doctoral thesis and research of the problem chosen by the doctoral student, which in its turn contributes to doctoral students' skills and competence in publishing the research results and preparing the doctoral thesis, facilitating their involvement in scientific and teaching work, as well as promoting their inclusion in international academic and scientific circles.

Graduates with a master's degree or equivalent higher education in agriculture or a related sub-branch of science (veterinary medicine, forestry or biology) can apply for doctoral studies in the program "Agriculture". If the master's degree is in another field of science, an entrance examination in Agricultural Biology may be determined. The entrance exam is designed to expand the circle of interested people who want to develop a doctoral thesis in forestry. The specified additional requirements will be agreed with the Higher Education Council. When studying in English in addition to the above requirements, you must have English language skills at least at B2 level.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Study plan of theoretical subjects in the doctoral programme is confirmed individually for each doctoral students not later than within two months of starting the studies.

Courses of doctoral programme are designed to deepen the foreign language knowledge (ValoD001) and research methodology (lauZD038) of first year's students supporting their ability to read and understand the recent scientific literature according to the general scientific practice to arrange experiments or research, record and process data with free access software (MateD005 and MateD001). Acquisition of the course Preparation of Scientific Papers (CitiD001) promote doctoral students' abilities and competences in good quality scientific articles, but in-depth acquisition of specialisation study course allows to have in-depth knowledge and promote understanding of relevance of the topic of the chosen doctoral thesis.

The programme was analysed within the framework of the project No. 8.2.3.0/18/A/009, involving of the leading researchers from the scientific institutions in Latvia as experts (Institute of Agroresources and Economics, Institute of Horticulture) and the leading researcher and professor from Helsinki University. When evaluating the programme's content, experts emphasized a necessity to learn foreign languages and recommended to offer teaching one of the courses in English, inviting foreign professors for that purpose.

Doctoral students cultivate and develop their skills suitable for the labour market, such as data accumulation and analysis, evaluation of environmental impact, entrepreneurship skills, during elaboration of their doctoral thesis. Development of such skills is related both to planning (including the financial planning), arrangement of the research or experiment, management of maintenance staff, data sourcing, collecting and analysis, preparation of the scientific reports and preparation of articles, communication with other scientists from the industry both in Latvia and abroad.

Measures introduced last year to restrict the global spread of Covid19 promoted attendance of various courses and planned scientific conferences in Zoom platform. Doctoral students took advantage of this opportunity and listened to the offered seminars in English, thus strengthening their knowledge of foreign language and application skills. Involvement of foreign professors for mastering of certain study course may be difficult, because mastering of the courses are mostly individual, involving consultations with the leading academic staff members. However, the doctoral students may take internationally offered courses in various topics more often.

Each doctoral thesis is unique, aimed at researching a certain problem related to agriculture industry. Majority of the doctoral students are involved in elaboration of various level of scientific projects and the obtained scientific doctoral degree (Ph. D.) in Agriculture, Forestry and Fisheries, Animal and Dairy Science is based on innovative achievements and insights of the relevant industry.

The awarding of a doctoral degree in Agricultural and Fisheries Sciences, Forestry or Animal and Dairy Science is based on the results of scientific research relevant to the field. This is evidenced by the topics of defended and approved doctoral theses, which are summarized in Annex 5.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

The programme was analysed within the framework of the project No. 8.2.3.0/18/A/009, engaging the leading researchers from the scientific institutions in Latvia as experts (Institute of Agroresources and Economics, Institute of Horticulture) and the leading researcher and professor from Helsinki University, and it allowed to conclude that the programme corresponds to the proposed goal, it is comparable to similar programs abroad.

Implementing of theoretical doctoral studies and conducting of scientific work enables preparation of the scientists and highly qualified specialists, who have deep knowledge of agriculture or animal and dairy cattle breeding sciences and scientific methodology. Courses included in the doctoral programme both promote and add to the skills of doctoral students. For example, preparation of the scientific articles result in good quality scientific articles for journals or conference paper compilations, and promote deeper understanding of the research methodology, which the doctoral students learn in other course (Research methodology).

Programme graduates can independently prepare project applications, individually conduct and supervise scientific research, can lead the teamwork and are able to collaborate in researcher groups of scientific projects in Latvia and abroad, can generate new knowledge in agriculture and

uniquely contribute to its development. Learn internationally acclaimed publication preparation skills, can present research results in international and national scientific conferences, congresses and symposiums.

Acquisition of individual specialisation courses enhance doctoral students' competence of individual problem-solving in agriculture science, define the fundamental subjects to be researched and set forth hypotheses, discuss them at national and international level, work for scientific or higher education institutions, taking academic positions or administrative positions in public administration and agricultural manufacturing.

The new doctors of science are competent to engage in teaching in order to prepare the new scientists.

During the studies, especially during preparation of the doctoral thesis, the obtained knowledge, skills and competences are transmitted to industry specialists and also undergraduate students of the Faculty of Agriculture. It is a constant development process from which the new scientists and industry experts and students benefit.

The priority research directions defined in the LLU development strategy, which are implemented by the Faculty of Agriculture, are closely related to the topics of doctoral theses and they are:

- Research of soil and land as basic agricultural resources.
- Improving plant productivity and crop quality through the use of environmentally friendly technologies.
- Research on microorganisms and invertebrates important in agriculture.
- Improving animal productivity and functional efficiency.

Doctoral studies ensure the acquisition of theoretical knowledge and research work methods, principles of scientific work organization, which are further used by doctoral students in the development of doctoral thesis and later scientific projects. The new doctors of science are a change for the academic staff and scientists of LLU LF.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Doctoral programme is aimed at individual work of a doctoral student in the chosen scientific direction, which is reflected in distribution of study volume between theoretical part (28 credits) and scientific part (92 credits). In order to successfully acquire the doctoral programme, the doctoral student and his or her scientific supervisor prepares an individual plan for the entire study period, for each study year. Topic of the doctoral thesis and individual student's plan is reviewed and discussed in the relevant institute of the Faculty of Agriculture, and it is approved in the sitting of the Board of Faculty. The doctoral student reports biannually for the work performed in the sitting of relevant institute and receives evaluation of his or her achievements.

During the studies the doctoral student takes doctoral examinations concerning the theoretical course of the programme, they are supervised by an examination commission consisting of 3

doctors of science approved by the Vice-rector for Studies of LLU.

The acquired courses are evaluated with a grade in 10-point system, where 10 - outstanding, 9 - excellent, 8 - very good, 7 - good, 6 - almost good, 5 - satisfactory, 4 - almost satisfactory, 3 - poorly, 2 - very poorly, 1 - unsatisfactory. Criteria and procedure for knowledge assessment are defined in the Study Regulation of LLU: <https://www.llu.lv/index.php/en/study-guide-documents>.

Portion of the scientific work is translated in credit points according to its suitability for the annual plan and according to the overall readiness level of the doctoral thesis. Reports on progress of current yearly plan are reviewed in the sitting of academic staff of relevant institute and accepted by the programme director.

Good quality doctoral studies are completed by the doctoral student with a successful examination and tests stated in the doctoral study plan, submission of doctoral thesis for defense of the doctoral degree in the Doctoral Council of the relevant industry, public defense of the doctoral thesis and acquisition of doctor's degree. Procedure for evaluation and defense of the doctoral thesis follows provisions the Cabinet Regulation No. 1001 of 27 December 2005 "Procedure and criteria for conferring doctor's degree" <https://likumi.lv/ta/id/314346-grozijumi-ministru-kabineta-2005-gada-27-decembra-noteikumos-nr-1001-zinatniska-doktora-grada-pieskirsanas-promocijas-kartiba-u...> (in Latvian).

One can see defended doctoral theses, their abstracts in the electronic data bases of LLU library. https://kopkatalogs.lv/F/?func=find-b-0&local_base=llu02

For additional information refer to:

Doctoral studies: <https://www.llu.lv/en/degree-programmes>

Doctoral programmes: <https://www.llu.lv/en/doctoral-study-programmes>.

Doctoral programme "Agriculture": <https://www.llu.lv/en/doctoral-study-programme-agriculture-LLU>.

Guidelines for delivery of LLU doctoral programme: <https://www.llu.lv/index.php/en/study-guide-documents>.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

Doctoral programme does not involve traineeship, however, the doctoral students conduct their research in certain research facility, engage in scientific or professional activities, solve and analyse problems and provide recommendations during their elaboration

All doctoral students purposefully participate in diverse events organised by the scientific or professional organisations, or they participate in organising of various events thus complementing their scientific, professional and lecturer's skills and competences.

Doctoral students are involved in preparation and delivery of the courses of their discipline for students of Bachelor's and Master's programmes.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

Information about doctoral theses' topics can be found in Tables 1 and 2 of Annex 5 (see Other attachments). Topic of the doctoral thesis is primarily based on its relevance in the given period. It is affected by possibilities to apply international scientific projects and current offers from the business.

During the sitting of the academic staff the relevance of topic, its contribution to new knowledge and problem-solving of the industry is analysed. Topics of the doctoral theses are most often related to scientific projects that are being elaborated at doctoral thesis' supervisor, or financed in a particular scientific institution.

Topics researched in field cultivation and horticulture are related to topical issues on formation of field crops and garden crops, selection problems for the purpose of biological production system, issues that will help to launch integrated plant growing system, molecular research of pathogens, formation of plant-microorganism association, use of plants as a source of renewable energy. Research on invertebrates and microorganisms vital to the agriculture; explanation of diversity of plant pathogen phenotypes and genotypes, their development cycles and development possibilities resulting from the climate change etc.

Topics of doctoral theses in animal and dairy animal breeding science are mainly related to quantitative genetics, and it is supported by the large data volume accumulated in the Agriculture Data Centre. Students are also interested in molecular genetics research. Topics in this discipline are elaborated in collaboration with independent research group "Genomics and bioinformatics". This group started cooperation with domestic animal breeders thanks to the group's support, molecular-genetic laboratory was organised in the Latvian University of Agriculture. Students also show interest in studies of nutrition of various animal breeds, accurate feed distribution technologies etc.

Lately the LLU Faculty of Agriculture has been cooperating with the Latvian Biomedicine Research and Study Centre (BMC), which is the leading research body in the molecular biology, biomedicine and biotechnologies in Latvia. This collaboration promotes deeper study of issues to be solved in agriculture.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

19 persons participated in the survey of doctoral students of the programme Agriculture, doctoral degree holders and employers, out of which 13 are doctoral students and 6 alumni. It can be explained with a fact that the same respondents were both doctoral students and alumni and later also employers in that particular period.

Survey results are generally positive. They reassure that the doctoral studies have supported

further self-learning process of the respondents. It has been concluded that doctoral students are satisfied with the structure of programme. They believe that doctoral studies provide sufficient knowledge, according to their wishes and specifics of the research, promote practical application of the knowledge obtained, and boost their competitiveness in the labour market. Results show that 16 respondents are satisfied with the course offer, whereas 3 believe that it should be broader. It must be marked that acquisition of the elective courses in the programme is very flexible. Doctoral students can choose the topics relevant to their study direction and learn them in universities of Latvia and European Union.

However, based on the results of doctoral students' surveys, study course programs are being improved. During the reporting period, the study program Animal Husbandry Products Production Technology has been improved, including non-traditional animal husbandry sectors, such as deer breeding, rabbit breeding and fish husbandry. The study course Horticulture has been prepared, combining the previously taught three study courses (Fruit Growing, Ornamental Horticulture and Vegetable Science).

All respondents believe that qualification of the academic staff members involved in programme delivery is suitable, and doctoral students, supervisors and academic staff members cultivate positive relationships and cooperation.

Survey respondents believe that provision of study process in terms of study literature and methodological materials is sufficient. Concerning the materially technical provision of study materials, 9 of them believe it to be sufficient and 10 hold that it should be supplemented. Regarding the direction of Animal and Dairy Science, they recommend to strengthen the experimental basis.

Majority of respondents (11) believe that international cooperation during the studies has been sufficient, whereas 8 think there is a room for improvements, and recommend to involve foreign lecturers in the study process. Opinion of doctoral students, alumni and experts who evaluated the programme overlap in this regard.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

Possibilities of outgoing mobility of doctoral students are vast. They are supported by cooperation agreements signed between LLU and various level universities, for example contracts within ERASMUS+ exchange programme include contracts with 29 countries. Mobility of doctoral students is enhanced also by other sources of financing – various scholarships (Jānis and Millija Kāvuši Scholarship managed by the LLU Development Fund, information about the scholarship <https://www.llu.lv/lv/stipendijas/attistibas-fonda-stipendijas/jana-un-millijas-kavusu-stipendija>, in Latvian), support funds etc.

In the reporting period, one of doctoral students learned in a university of Portugal (Universidade Trás-os-Montes e Alto Douro), two participated in the courses organised by EuBerry in Geisenheim, Germany “Berries Physiology – Cultivation – Quality – Processing”, one participated in NOVA PhD courses “Adaptation and Resilience in Plant Breeding” organised by the Swedish University of Agricultural Science thus obtaining additional knowledge in plant breeding. One of doctoral students studied at Aarhus University, Global Rust Research Centre in Denmark, between

02.10.2017 and 28.10.2017. Goal - to learn about wheat infecting with *P. striiformis* spores, uredospore proliferation, phenotyping, and repeatedly on 24.02.2019 - 01.03.2019. Goal - to learn about phenotyping of *P. striiformis*, basic skills of genotyping, work in the greenhouse and laboratory, and she also studied at John Innes Centre, Noridge, Great Britain (RustWatch Workshop on Marple diagnostics) 03.11.2019. - 07.11.2019. Goal - to learn working with MARPLE software, *P. striiformis* rust identification.

One of doctoral students mastered NOVA doctoral course "Biodiversity Based IPM in Field Crops" (3 ECTS) at the Swedish University of Agriculture Science, Uppsala in 2015, and course "Moderns IPM in Greenhouses" (3 ECTS) in Iceland Agricultural University, in Hvannery, Iceland, in 2016.

Four doctoral students participated in ERASMUS+ exchange programme to improve professional skills and competence level.

Content of the courses mastered in the mobility programme is reviewed and acknowledged as similar to one of the courses of programme "Agriculture"; this task is carried out by the Doctoral Council of Agriculture, Forestry and Fisheries Sciencedirection Field cultivation sub-field or Animal and Dairy Science.

Until now, the study program has not been offered in English, foreign students have not studied in it, therefore no information on the mobility of incoming students has been provided.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Doctoral programme "Agriculture" is implemented only as full-time studies. Number of study places from public funding are stipulated in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Agriculture (LLU). When calculating the state funding for delivery of programmes, study level ratio, which is 3 for doctoral programmes and study cost ratio, which is 1.8 for programme "Agriculture" in thematic field of education, is taken into consideration. Size of the ratio between the academic year of 2013/2014 and 2019/2020 has not changed, but scope of one study place basis varies between 1,333.36 EUR and 1,518.98 EUR. Social provision of a study place is the same across all years, i.e. 2,034 EUR.

Costs per one doctoral student in programme "Agriculture" in 2013 was 7,855.60 EUR, they were slightly increased year by year, reaching 10,234.44 EUR in 2019. Majority of the state funding was channelled for academic staff and assistant remuneration, some part for doctoral scholarships and some for infrastructure maintenance, incl. library, which provides doctoral students with access to scientific literature databases. The state financing does not cover costs related to the research work

of the doctoral student, comprising arrangement of the research, conducting of the necessary analyses, publication preparation and editing and participation in conferences. This portion of costs is partially covered when engaging the doctoral students in performance of the scientific project. It allows the doctoral student to start the researcher's career under a supervision of a competent researcher, to obtain scientifically grounded, credible research results and to prepare doctoral thesis at good quality. Symbiosis between the supervisor and doctoral student in this process is positive, because the doctoral student provides a lot of support in analysis of the data obtained, preparation of publications and presentation of data obtained. Majority of publications are results of collaboration of doctoral student and supervisor of the doctoral thesis.

For the implementation of the doctoral study program, the laboratories, equipment and other necessary resources of our University and the Faculty of Agriculture are used. The material and technical resources are described in section 3.2 of Part 2 of the report and in the report of professional bachelor study program "Agriculture" in section 3.1. Information on the information base used in the study program is described in Part 2, Section 3.3 of the report.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

Since 2015, LLU is a partner to the Latvian Academic Network (LAT). LAT provides connection to the Latvian science infrastructure network, services, scientific libraries, databases and provide connection to science infrastructure also for LLU supervisory institutions Institute of Agroresources and Economics and Institute of Horticulture, thus bringing the scientific IT infrastructure management of science branches present in LLU under one roof. Within the framework of LAT project, LLU has obtained high-performance servers, driver array, network infrastructure devices that ensure high capacity of mathematical calculations (cloud computing, laser-scanned data processing), data analysis and statistical processing, modelling processes. A multi-fibre optical network extends among LLU facilities in Jelgava, and it provides high-performance data flow among LLU Faculties to perform multidisciplinary studies and process data on the basis of LLU centralised IT resources or transport data via optical connection to the uniform LAT data centre in Riga.

In order to conduct their research, the doctoral students can use all LLU labs and infrastructure of other scientific institutes. A single LLU portal has been developed to reflect activities of the institutes under its auspices. As a result of the projects, the scientific equipment has been upgraded. Data on existing equipment are available at <https://www.llu.lv/lv/zinatniska-inventara-datubaze> (Latvian only).

Part of LLU labs and structural units, which are used more frequently for delivery of doctoral programme "Agriculture".

Scientific Laboratory of Biotechnologies (LLU BZL) was opened under a resolution of LLU Senate No. 9-59/14.12.2016, merging LLU Scientific Laboratory of Agronomy Analyses and LLU Scientific Laboratory of Molecular Biology and Microbiology. Smart Technologies section was opened in the laboratory with the Resolution No. 10-33 of 9 October 2019 of LLU Senate.

LLU Scientific Laboratory of Biotechnologies (<https://www.llu.lv/en/research-laboratory-of-biotechnology>) is the basic unit of research,

performing test orders, providing opinions, maintaining and preserving the gene bank of Latvian agricultural animals and conducting scientific research in one of sub-branches of the science.

Laboratory structure consists of and comprises:

1. **Division of Agronomic analysis section**, which offers to determine various physically chemical indicators in the feed both with chemical methods and NIR (near infra-red light) spectrometer, perform accredited physically chemical indicator analyses in plant correction agents.
2. **Division of Molecular biology and microbiology** offers services in animal and plant molecular genetics, bacteriology, veterinary microbiology and mycology.
3. **Division of Smart Technology section**, which allows using the latest technologies (3D digital light microscope, confocal laser-scanning microscope) for in-depth study of plants or other samples.

Institute of Plant Protection Research “Agrihort” of Latvia University of Life Science and Technologies (<http://agrihort.llu.lv/en>). Goal of the institute is to perform international scientific and actual research in plant protection sector.

Main tasks of the institute:

to conduct research on harmful organisms of crops: causal agents of diseases, pests and weed biology and interaction with the crop;

to elaborate, adapt and demonstrate sustainable technologies, methods and products of control harmful organisms;

to prepare and disseminate scientific and popular-scientific publications;

to develop cooperation with other scientific institutions, companies and organisations to improve the scientific and economic activity.

Research Institute of Agronomy of Latvia University of Life Science and Technologies.

The Institute conducts scientific research, breeds perennial herbaceous plants and prepare the top category seeds for the newest varieties, test economic properties of field varieties in conventional and biological agriculture, prepares the new scientists according to LLU doctoral programme.

SIA LLU Training and research farm “Vecauce” provides a platform for scientific tests of students in agriculture sciences. MPS “Vecauce” gives an opportunity to LLU students, master and doctoral students to conduct research for elaboration of bachelor, master and doctoral thesis and also deliver business offers regarding research of varieties, plant protection agents, fertilizers and growing technologies.

Study and Research farm “Pēterlauki” is a structural unit of the Faculty of Agriculture, its goal it to participate in delivery of programmes and scientific and advisory work of LLU Faculty of Agriculture, in cooperation with the Institute of Soil and Plant Science, Institute of Animal Science, Faculty of Veterinary Medicine and other structural units of LLU. Main tasks of MPS “Pēterlauki” are related to study process and scientific research:

providing the experimental basis for academic staff, doctoral and master students and for performance of the scientific research and arrangement of experiments;

to serve as a basis for organising and taking place of practical seminars.

According to Decree No. 640 of 21 October 2015 of the Cabinet of ministers, as of 1 January 2016, LLU **APP “Institute of Agricultural Resources and Economics”** was built on the basis of State Priekulji Plant Breeding Institute, State Stende Cereals Breeding Institute, Latvian State Institute of

Agrarian Economics and including there also the Agriculture Sciences Center of Latgale.

The only scientific institute in Latvia developing research in field crop selection. Scientists specialising in breeding and field cultivation sectors and interdisciplinary research in economics work there. The priority research directions of the Institute:

Field crop genetics and breeding for integrated and biological farming system

Development of sustainable field crop breeding technologies for various farming systems

Evaluation of field crops for efficient use

Production of feed

Sustainable development economics of bioresource industries

Efficiency of production processes and competitiveness of companies

Study of sustainable development options for territories

LLU **APP "Institute of Horticulture"** was opened on 1 January 2016 on the basis of Latvia State Institute of Fruit Growing, Pure Horticultural Centre and farm "Vīnkoki". The Institute of Horticulture represents agriculture and food industries and implement research in orcharding and vegetable gardening, thus strengthening the capacity of horticulture and contributing to development of the industries. The priority research directions of the Institute:

Diversification and breeding of garden plant varieties suitable to the Baltic Sea region;

Environmentally friendly garden plant growing systems;

Garden plant storage and processing technologies;

Research of biological basis of horticulture science.

The Institute strengthens the scientific potential in the Faculty of Agriculture and provides an opportunity to improve study quality in courses related to horticulture.

Each faculty has several equipped scientific laboratories aligned with the specifics of studies and research. LLU LF study and scientific laboratories:

Plant Pathology and Microbiology Laboratory;

Plant Biology and Physiology Laboratory;

Scientific Laboratory of Grains and Seeds;

Scientific Laboratory of Soil and Agrochemistry;

Laboratory of Garden Plants and Apilogy.

In order to carry out research in animal and dairy science disciplines, data accumulated in **Agriculture Data Centre Republic of Latvia** about origin, productivity and genetic value of all animal breeds are used for the research. <https://www ldc.gov.lv/en>, as well as laboratories of LLU Faculty of Veterinary Medicine and Faculty of Food Technologies.

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

20 academic staff members from 3 LLU Faculties, all of them holding a doctor degree, are involved in delivery of the doctoral programme "Agriculture". The average age of the academic staff members is 55 years, which is by 4 years less than in the academic year of 2013/2014. It is due to the fact that the new teaching staff members who obtained their PhD in this reporting year, namely in academic year of 2020/2021, are involved in program delivery, and in comparison to the academic year of 2013/2014 a number of professors went down while number of university lecturers has grown by 9 or 45% and 6 or 30% respectively. Two of the new university lecturers are not involved in directing the courses, nevertheless they supervise the doctoral theses. Recently, in parallel to LLU LF academic staff members, also the leading scientists from the scientific institutes are involved in supervision of the doctoral theses, and thus there are two supervisors of the thesis.

The change of the academic staff involved in the implementation of the doctoral study program is mainly related to the retirement of senior professors. The new lecturers with a doctoral degree have been elected to the position of associate professor or assistant professor. The involvement of new academic staff in the implementation of the study program does not reduce the quality of studies, as their knowledge and skills in the fields of foreign languages, information technology and communication are at a good level (see person CVs). It ensures the involvement of doctoral students in the preparation of international projects and recognized scientific articles, thus increasing the international recognition of LLU and LF and the quality of studies.

Changes in academic staff as well as structure of the Faculty of Agriculture were made during the reporting period. Since 1 September 2018, LLU Faculty of Agriculture has 2 institutes: Institute of Soil and Plants Science (AAZI) and Institute of Animals Science (DZZI), Laboratory for testing of value for cultivation and use of agricultural crop varieties (SĪN) and MPS "Pēterlauki" <http://www.lf.ltu.lv/lv/strukturvienibas>, Latvian only)

16 university lecturers and researchers holding a doctoral degree in agriculture, 2 holding a doctoral degree in biology sciences and 1 holding a doctoral degree in economics work at AAZI. 7 university lecturers and researchers with doctoral degree in agriculture science work for DZZI.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

20 qualified academic staff members are involved in delivery of doctoral programme "Agriculture", 19 (95%) of them work for the Latvia University of Life Science and Technologies as the primary job. All academic staff members have been elected in their positions according to the Resolution No. 10 - 53 of 11.12.2019 adopted by the Senate, Regulation of the Latvia University of Life Science and Technologies on academic positions.

<https://www.llu.lv/sites/default/files/2019-12/Pielikums%20Sen%C4%81tam.pdf> (Latvian only).

Election of the academic staff members in a suitable academic position confirms correspondence of person's academic and professional qualifications both for study and research work. Supervisors of doctoral theses are experts of Latvian Science Council (LZP) and supervisors or executors of scientific projects. Some part of the scientific supervisors participate in delivery of international scientific projects.

Directions of scientific activity stated by the academic staff members in their CV are closely related to courses headed by them, thus ensuring integration of most recent scientific insights into the courses and choice and supervision of relevant topics for doctoral theses. Academic staff members' qualification can also be judged from the quality of publications, their inclusion in international peer-reviewed databases (Annex 6). Academic staff member evaluation by H-index elevates year after year, 75% of the academic staff members involved in programme delivery has index of 3 and above.

Academic staff of the Faculty of Agriculture of LLU is engaged in international professional and scientific associations and unions of relevant industry, such as:

- Nordic Association of Agricultural Scientists (NJF),
- European Society for Agronomy (ESA),
- International Soil Tillage Research Organisation (ISTRO),
- British Society for Plant Pathology (BSPP),
- International Society for Horticulture Science (ISHS),
- European Weed Research Society (EWRS),
- International Union of Soil Sciences (IUSS),
- KBBE-net – Knowledge Based Bioeconomy, European Cooperative Programme for Crop Genetic Resources Medicinal and Aromatic Plants Working Group;
- EAAP – European Federation of Animal Science etc.

Academic staff members undergo professional upgrade on a regular basis.

Qualification upgrade of teachers in teaching courses is mandatory once in every six years. They attend English courses and courses related to the advanced mastery of new technologies, such as “Dynamic and Active Presentation”, “Cloud Services for Data Storage and Sharing” etc.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

Academic staff members involved in programme delivery head their lectures and sessions in programmes of all levels, therefore majority of their work is devoted to provision of good quality study process, including preparation of study materials, classes, individual consultations, which are even more important for doctoral studies.

In parallel to this work, a huge emphasis is put on publishing the scientific research results in publications of various levels and participation in conferences. In a period between 2013 and 2020,

228 publications have been published in indexed issues at Scopus and Web of Science databases, 107 or 46.5% of them are publications in journals and 123 or 53.5% of them are published in scientific conference papers' collections (Annex 6). During the last 3 years, the majority of publications have been included in journals, mainly in Agronomy Research, Acta Fytotechnica et Zootechnica, Acta Horticulturae, and there are also publications in journals Advances in Agronomy, European Journal of Agronomy, Canadian Journal of Plant Pathology, Photosynthetica, Agriculture etc.

Academic staff members and doctoral students take an opportunity to publish their papers in the scientific journal "Rural Sustainability Research" of LLU, which has been indexed in international SCOPUS database since February 2020.

Collections of conference papers from conferences organised by LLU, for example Scientific and Practical Conference on Harmonious Agriculture <http://www.lf.llu.lv/lv/lidzsvarota-lauksaimnieciba> (Latvian only), Harvest Festival in Vecauce and others, and also publications in professional journals are used to inform agriculture industry specialists.

Full information about academic staff members' publications is gathered in LLU library database https://kopkatalogs.lv/F/NLLF9V6KELQFTB51ATC8TE251Y3UDEKN4KUGGJ3428YEIV3NBR-05332?func=option-update-Ing&P_CON_LNG=ENG.

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

Academic staff of the Faculty of Agriculture actively supervises and/or participates in elaboration of scientific projects (Annex 4). Since the academic year of 2012/2013, scientific projects of international scale were launched, such as ERA-NET, and since 2015/2016 a series of INTERREG projects.

Here we should mention FP7-KBBE-2013-7 Grant Agreement No. 613781, EUROLEGUME Enhancing of legumes growing in Europe through sustainable cropping for protein supply food and feed, which was supervised by LF professor and leading researcher from LLU part. Researchers from the project group participated in a competition "Sower 2018" with the results of this research, and became winners in the nomination "Science for Practice and Innovations" in group "Science for Innovation". Leading researchers and researchers from LLU Faculty of Agriculture, Food Technology, Veterinary Medicine, Economics and Public Development and Information Technologies, Institute of Horticulture, Pūre Horticulture Research Centre, Institute of Agroresources and Economics, Priekuli Research Centre and SIA "Bioefekts" engaged in its implementation, thus confirming close cooperation with both LLU Faculties and institutes.

As the issue of climate change, ensuing consequences and prevention possibilities has emerged to the front, LLU scientists supervise and participate both in international and local projects to solve the mentioned problems. In field cultivation sub-discipline these are projects about sustainable use of land resources, renewal of coefficients used in calculation of nutrition balance, assessment of plant resistance etc., in gardening sub-discipline, about technologies for breeding golden currant and garden blueberries, elaboration of new management methods for greenhouse plant lighting

systems, careful growing of Japanese quince (leading institution: Institute of Horticulture) and others.

In Animal and Dairy Science discipline these are topics on feed dosage optimisation, digestibility of nutrition and possibilities to use precision technologies to herd supervision and economic use. List of projects and reports are available at LLU website: <https://www.llu.lv/en/international-research-projects>.

Cooperation projects with Lithuanian and Belarusian scientists have been implemented. They are financially supported mostly by the Ministry of Agriculture inviting to participate in the research projects to solve issues relevant for the industry. In the reporting period 22 academic staff members and researchers from the Faculty of Agriculture participated in such projects.

LLU implements several internal research projects (Strengthening of scientific capacity in LLU; Basic research in LLU; implementation of LLU research programme). Researchers from LLU Faculty of Agriculture involve doctoral students in elaboration of projects to an extent possible, thus providing the data necessary for their theses and attracting the funding for analyses. Topics of the doctoral theses are often related to the research in relevant project.

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

Involvement of the academic staff in the scientific research both at national and international level is evidenced from the project participation data found in Annex 4.

6 National Research Programmes and 3 projects financed by the Latvian Science Council (LZP) were implemented during the reporting period. One of them is project “ Pathogenicity and Diversity of *Botrytis spp.* - important causal agent of legume disease”, Project No. R124, leader of projects - a professor and, leading researcher of LLU, and leading researcher from Helsinki University.

One of examples of international cooperation is project “Climate-friendly Cattle Breeding Systems (CCCfarming)” (project number ZV 90). Project supervisor and leading researcher is a doctor of agriculture sciences from the Faculty of Agriculture. Elaboration period December 2019 to November 2022. Project group contains nine leading research institutes as well as stakeholders from Europe and elsewhere, ensuring wide coverage of environment and agriculture systems. The following LLU Faculties and institutes are involved to implement the project: The Faculty of Agriculture, Institute of Soil and Plants Sciences, Institute of Animal Sciences, Faculty of Engineering, Faculty of Economics and Social Development. Project coordinator: Stichting Wageningen Research (Wageningen Livestock Research), (Netherlands). Cooperation partners: Netherlands, Germany, France, Italy, Poland, Great Britain, Lithuania. Project implementation costs EUR 210,000.00 (two hundred ten thousand EURO 00 cents) in total, and they are financed from the budget of Latvian government. As mentioned before, these are only some examples.

Academic staff of the Faculty of Agriculture is involved in projects related to the industry and delivered study courses, and the obtained conclusions for betterment of further course content.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

In order to ensure study process, the academic staff collaborates with various educational and scientific institutions of Latvia and other countries. Doctoral students are offered to attend study courses organised by other universities and scientific conferences,

Not only LLU lecturers, but also the leading researchers from other scientific institutions are involved in delivery of specialised courses for the doctoral students. For example, several researchers from “Silava”, AREI, DI and LU Faculty of Biology have participated in the special course “Special research course”. Closer cooperation with supervisor of the doctoral thesis and staff members from other scientific institutions is created during the elaboration of the research for doctoral thesis.

Cooperation partners of the Faculty of Agriculture in science and teaching issues:

- Latvian Academy of Agricultural and Forestry Sciences;
- Faculties of Biology and Earth Sciences of the University of Latvia;
- LU Botanic Garden;
- Latgale Agricultural Science Centre;
- ZPI „Silava”;
- Scientific Institute of Food Safety, Animal Health and Environment BIOR;
- Latvian Biomedicine Research and Study Centre;
- LLU MPS „Vecauce”

Higher education and research institutions of agriculture discipline in Europe:

- Estonian University of Life Sciences (Tartu);
- Former Alexander Stulginsky University, current **Vytautas Magnus University** (Lithuania);
- Swedish University of Agricultural Sciences (Uppsala);
- Šiauliai University (Lithuania);
- Helsinki University (Finland).

Third countries:

- Grodno State Agrarian University (Belorus) and others.

International cooperation has taken place through participation in the Board of Experts in Croatia, due to accreditation of programmes in Osijek University, Faculty of Agrarian Biotechnology (25.11-29.11.2019), Doctoral Council work in Lithuanian Research Centre for agriculture and forestry, Vytautas Magnus University were Yuliia Kochiieru defended with her doctoral thesis “Mycotoxins in spring cereals and their effect on the quality of grain products” (10.12.2020) and Sigita Janavičiene defended her doctoral thesis “Changes in type A and B trichothecenes, important grain quality factors, during cultivation on spring cereals and grain storage” (12.12.2019).

Academic staff members participate in ERASMUS+ activities by delivering sessions and experience exchange within the framework of their professional upgrade. Most frequently attended universities are Estonian University of Life Sciences, University of Helsinki, Wageningen University, Georg-August Universitat Gottingen and others.

International cooperation opens up an opportunity to improve programme, upgrade qualification of the doctoral students, supplement special literature resources, ensure acquisition of the latest research methods and methodologies by the doctoral students.

In the implementation of the study process, the cooperation of the academic staff and laboratory heads of the LLU faculties and LF structural units is formed during the study course acquisition process, as well as in the process of development of scientific projects and preparation of scientific articles. Scientific projects, the results of which are often the basis of the doctoral thesis, bring together colleagues from different scientific institutions.

Student-lecturer ratio in the doctoral programme "Agriculture" is 11, while academic staff load is 1.46 positions.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	1_pielik_Statistikas-dati_Statistical-data_LD_lv_en.pdf	1_pielik_Statistikas-dati_Statistical-data_LD_lv_en.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard		
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	2_pielik_Studiju kursu kartejums_Mapping_LD_lv_en.xlsx	2_pielik_Studiju kursu kartejums_Mapping_LD_lv_en.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	3_pielik_Study-plan_LD_en_prec.pdf	3_pielik_studiju plāns_LD_lv_prec.pdf
Descriptions of the study courses/ modules	Study_courses_description_Ls_PhD.rar	Studiju_kursu_apraksts_Ls_dokt.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Doktora_diploms_Lauksaimnieciba_EN.pdf	Doktora_diplomi_Lauksaimnieciba_LV.pdf
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	dok_stud_prog_Lauksaimnieciba_AIP_atzinums_EN.docx	dok_stud_prog_Lauksaimnieciba_AIP_atzinums.edoc

Forest Engineering (42623)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Forest Engineering</i>
Education classification code	<i>42623</i>
Type of the study programme	<i>Professional bachelor study programme</i>
Name of the study programme director	<i>Agris</i>
Surname of the study programme director	<i>Zimelis</i>
E-mail of the study programme director	<i>agris.zimelis@llu.lv</i>
Title of the study programme director	<i>Ph. D.</i>
Phone of the study programme director	
Goal of the study programme	<i>Prepare qualified forest managers and future policy makers – professionally and comprehensively educated and independently thinking personalities who are able to use modern information domains / technology services and apply latest scientific findings to improve the industrial manufacturing technologies, understand production process and its unity with environment, ensuring sustainable and rational forest management, preserving and increasing of their values as well as developing unconventional ways to use the forest resources in wide range.</i>
Tasks of the study programme	<i>Programme’s task is to provide students with theoretical knowledge and develop practical skills in forest evaluating, regenerating, maintaining and harvesting, timber delivery, sale and primary processing for consumers, as well as for solving issues related to forestry economics and Latvian economy.</i>

Results of the study programme	<p><i>Knowledge - forest ecology, principles of forest management and silviculture, planning of forest management, primary and secondary forest utilisation, harvesting and logistics of forest materials, forest infrastructure, values of non-timber and use thereof, forest economy and commercial activity.</i></p> <p><i>Skills:</i></p> <ul style="list-style-type: none"> - <i>must prove in different situations that knowledge obtained in the study programme can be evaluated as having high quality.</i> - <i>must be able to apply theoretical and practical knowledge in solving industry's problems;</i> - <i>apply different work methods, techniques, technical solutions, designing and production technologies in forestry production and practical work;</i> - <i>apply Latvian, international and global forestry standards, notions and terms as well as updated laws and regulations;</i> - <i>provide recommendations to successfully manage forest resources from economic, ecological and social aspect;</i> - <i>apply the acquired research skills and competences in scientific research activity.</i> <p><i>In order to achieve the results, a graduate can apply modern solutions, technologies and equipment:</i></p> <ul style="list-style-type: none"> - <i>is able to independently define the research problem, put forth a goal and subordinate research tasks, choose appropriate methodology and to make individual research according to it, to analyse the obtained data and compare them to similar research and present them when defending the Bachelor thesis;</i> - <i>is able to make independent decisions when planning and supervising the forestry and felling works;</i> <p><i>Programme's alumni acquire comprehensive theoretical and professional skills and also skills required in production, which would allow successfully working for different harvesting companies, choose a work in companies and their management teams suitable for their interests or develop own business.</i></p>
Final examination upon the completion of the study programme	<i>Bachelor Thesis</i>

Study programme forms

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>4</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>160</i>
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Forest Science</i>
Qualification to be obtained (in english)	<i>Engineer of Forestry</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Part time extramural studies - 5 years - latvian

Study type and form	<i>Part time extramural studies</i>
Duration in full years	5
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Forest Science</i>
Qualification to be obtained (in english)	<i>Engineer of Forestry</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Parameters of the study programme have not changed since the last accreditation.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Dynamics of the number of students during the last years is evaluated as positive, that is to say, decrease in the number of students, which is partly explained by demographics in our country, has stabilised. Number of students has increased during last three years (Fig. 1). Possibly, one of the factors encouraging this increase, is growing demand in the industry for highly qualified labour force (Dynamic University, "Pētījums par darbaspēka pieprasījuma tendencēm projekta Nr.8.2.3.0/18/A/009"/ A study of labor demand trends in the project) as well as improvement of study process quality.

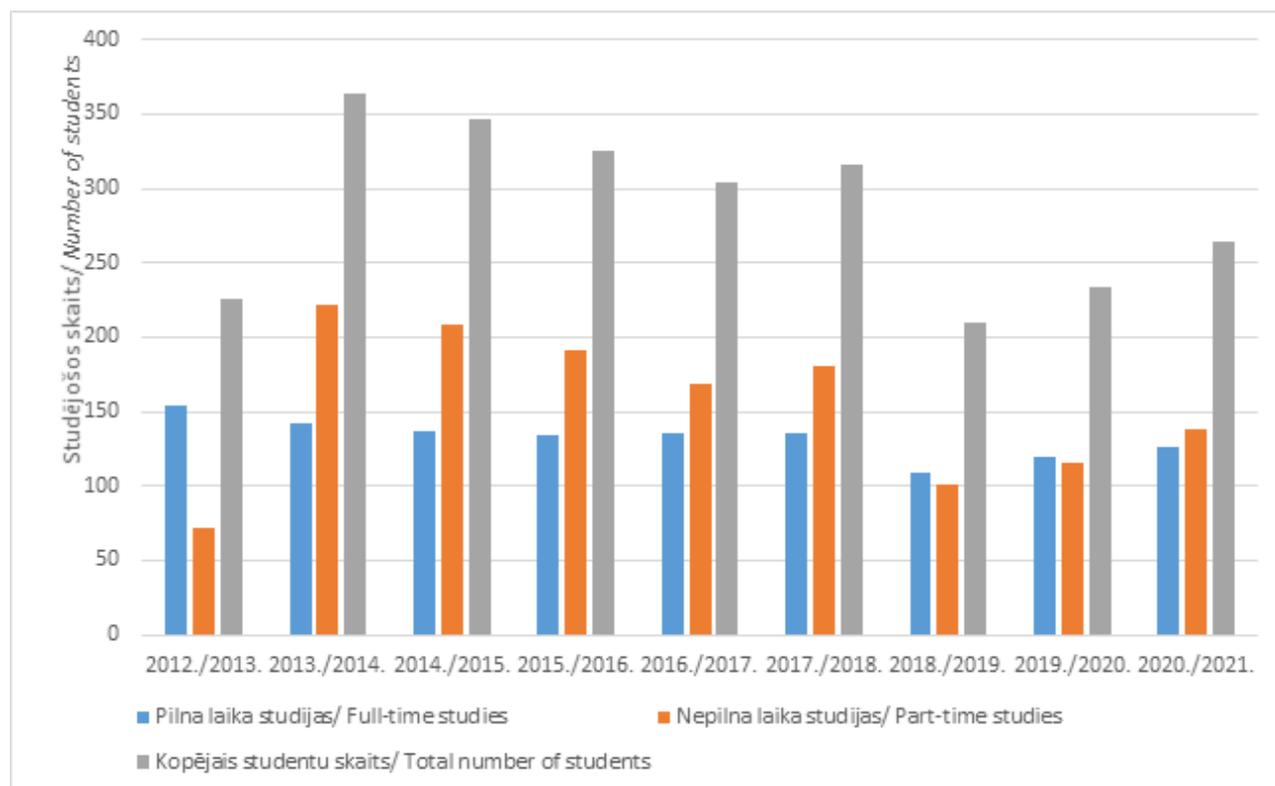


Fig. 1. Number of students at Professional study programme "Forest Engineer"

Full-time students mostly do not work, majority of them enrol to the Forest Faculty right after graduating from the secondary school. Number of students in full-time studies in academic year of 2012/2013 was the highest, and the following study years saw gradual decrease with the lowest number in academic year of 2018/2019 (Fig. 1).

Majority of part-time students are employed, also in the forest sector. Most often a need for education is driven by career promotion aspirations. Majority of part-time students marked widening of knowledge and professional horizon and acquisition of new contacts as the motivation behind studies. Between 2013 and 2018 a steep increase of part-time students was related to a demand for qualified employees in the industry. For example, in order to work as a harvesting specialist, one needs to have a Bachelor's Degree in Forestry. If companies of the industry dictate such requirement for their employees and a diploma of Bachelor of Forestry is considered as document which confirms knowledge and relevant skills, it is a positive sign for the study programme and indicates at high quality of education and also a prestige of the position.

In order to improve the study process, reasons why students discontinue studies are analysed. Several reasons are mentioned in the first year. 22% of students do not comply with programme's requirements and the same amount - financial liabilities. 16% of them do not start studies. It means that students have changed their mind. In this situation it is not possible to find out if a student has chosen another study programme. Approximately 32% discontinue studies voluntarily without stating the reason. The largest student dropout in the first year was in 2013 when 54 students discontinued studies. Over last years this trend has considerably lowered, for example, 21 students terminated studies in 2018 whereas 13 in 2019.

In the second year the main reasons for terminating the studies were non-compliance with programme's requirements (53%) and failure to comply with financial obligations (24%). 8% of students discontinued studies voluntarily without stating any reason. Total reduction of the number of students in the second year in 2019 was 6 students, which is more than twice as little as in 2018 when 14 students left the studies.

The main reasons for discontinuation of studies in the third year are similar, i.e. 46% of students do not comply with programme's requirements and 23% - with financial obligations, and 15% of students discontinue studies by not registering. 4 students left the studies in third year in 2019.

Reasons of discontinuing the studies in the fourth year for 64% of students was failure to comply with study programme's requirements and 21% - unsettled financial liabilities. A failure to comply with study programme's requirements is related also to final exam of the studies where the students do not meet the demands timely and at good quality, which is related to pre-defense of the Bachelor thesis and hence they are forced to discontinue studies. Such students largely try to elaborate and defend Bachelor thesis next year. 6 students left the studies in fourth year in 2019.

The reason for discontinuing the studies also in the fifth study year (full-time students) is mainly related to a failure to meet the study obligations. 1 student left the studies in 2019.

Study programme Forest Engineer is delivered in line with the best practice and individual approach. It means that every student who wishes to leave studies is invited to talk about possible solutions and returning to studies after some time. Sometimes failure to meet the study requirements is due to a new employment of the student and the new schedule intervening with studies. In this case, students often return to the faculty for part-time studies.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and

professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

The Forest Faculty of Latvia University of Life Sciences and Technologies provides one professional Bachelor's study programme "Forest Engineer" (education code - 42623). Students of professional Bachelor's study programme "Forest Engineer" are conferred the Professional Bachelor Degree in Forest Science and the qualification of Engineer of Forestry. The obtained qualification corresponds to the fifth professional qualification level (Annex 1). Total volume of the study programme Forest Engineer is 160 credits; duration of full-time studies is 4 years (Law On Higher Education Institutions, Article 57 - <https://likumi.lv/ta/id/37967-augstskolu-likums>, only in Latvian) and part-time studies - 5 years.

The main goal of the programme is to prepare qualified forest managers and future policy makers - professionally and comprehensively educated and independently thinking personalities who are able to use modern information domains / technology services and apply latest scientific findings to improve the industrial manufacturing technologies, understand production process and its unity with environment, ensuring sustainable and rational forest management, preserving and increasing of their values as well as developing unconventional ways to use the forest resources in wide range. Programme's task is to provide students with theoretical knowledge and develop practical skills in forest evaluating, regenerating, maintaining and harvesting, timber delivery, sale and primary processing for consumers, as well as for solving issues related to forestry economics and Latvian economy.

The study programme is available in Latvian only.

In order for the programme "Forest Engineer" to prepare specialists suitable for industry's requirements and be aligned with changes and technology development of today, development of its content is an ongoing process. It is based on LLU development strategies 2015 - 2022 and the guidelines included in "Strategy-agenda of the Forest Faculty 2020 - 2024". According to the strategic documents, the goal and main task of improvement of study process is to give students relevant, modern study programmes compliant with market requirements and traineeship opportunities, which happens in close collaboration with the leading industry specialists and academic staff members of the Forest Faculty who constantly develop their professional and teaching competences.

The study programme corresponds a standard "Forest Engineer". The professional standard was approved by the Order of the Ministry of Education and Science of 14 February 2003 No. 79., the developed standard is available on the website of the State Education Content Center, in the section "Mandatory applicable professional standards and pre-professional qualification requirements". Programme title includes a wide range of competences which characterise the qualification/position/speciality included in this title. A degree to be obtained "Professional Bachelor Degree in Forest Science and the qualification of Engineer of Forestry" fully complies with industry's demand for modern and independently thinking student who can make competent decisions and solve issues from various perspectives and knows forestry both as economic industry and technologies, starting from soil preparation to sorting of round timber in lower end wood-yard.

Description of professional study programme Forest Engineer states:

- a forestry engineer manages a forestry company or a structural unit of a company;
- works in state forestry institutions, other organizations and companies or farms as a manager, forestry consultant, advisor;

- plans the work of forestry companies;
- handles financial and accounting issues;
- develops business plans and estimates;
- plans technological processes and activities;
- organizes a hunting farm;
- ensures production conditions in accordance with labor protection requirements;
- understands the basics of business, economics, accounting and legislation, performs economic analyzes;
- ensures the application of liability for violation of regulatory enactments regulating forest management and use;
- obtains and analyzes information;
- carries out scientific research work in the forestry sector.

Knowledge – forest ecology, principles of forest management and silviculture, planning of forest management, primary and secondary forest utilisation, harvesting and logistics of forest materials, forest infrastructure, values of non-timber and use thereof, forest economy and commercial activity.

Once the professional higher education study programme Forest Engineer is acquired, the alumni

- must prove in different situations that knowledge obtained in the study programme can be evaluated as having high quality.
- must be able to apply theoretical and practical knowledge in solving industry's problems;
- apply different work methods, techniques, technical solutions, designing and production technologies in forestry production and practical work;
- apply Latvian, international and global forestry standards, notions and terms as well as updated laws and regulations;
- provide recommendations to successfully manage forest resources from economic, ecological and social aspect.
- apply the acquired research skills and competences in scientific research activity. Organisation of scientific research and practical work.

In order to achieve the results, a graduate can apply modern solutions, technologies and equipment:

- is able to independently define the research problem, put forth a goal and subordinate research tasks, choose appropriate methodology and to make individual research according to it, to analyse the obtained data and compare them to similar research and present them when defending the Bachelor thesis;
- is able to make independent decisions when planning and supervising the forestry and felling works;
- programme's alumni acquire comprehensive theoretical and professional skills and also skills required in production, which would allow successfully working for different harvesting companies, choose a work in companies and their management teams suitable for their interests or develop own business.

The professional standard determines the main sections, the professional competencies required for the performance of professional activities, the skills required for the performance of the basic tasks of professional activities and the knowledge required for the performance of the basic tasks of professional activities. A set of necessary knowledge provided by the study programme is divided into six sections:

1. Generally educative courses – 9 different courses with 20 credits in total;

2. Industry's theoretical courses – 16 different courses with 36 credits in total;
3. Industry's professional specialisation courses – 24 different courses with 60 credits in total;
4. Elective courses with 6 credits in total;
5. Elaboration of the final paper (Bachelor thesis) with 12 credits in total;
6. Study traineeships – 6 different traineeships with 12 credits in total;
7. Professional traineeships – 2 different traineeships with 14 credits (Annex 2).

Once the students have acquired generally educative course, they have the basic knowledge, skills and competences; once they master the industry's theoretical basic courses and study traineeship, they obtain theoretical knowledge in forest sector and understand their application in practice; once students acquire industry's professional specialisation courses, they learn skills and competences of application of theoretical knowledge. This knowledge and skills are reflected when elaborating and defending the Bachelor thesis in the National Examination Commission.

Taking into account the instruction language of the programme (Latvian only), one of requirements for student admission is a successfully passed examination of the Latvian language in the secondary school. In order for a student to be competitive in the labour market and be able to root their decisions in scientific conclusions and have international perspective, they also need to study in foreign language for some time. It defines a requirement for potential students to pass centralised examination in foreign language (Assessment of centralised examination in foreign language can be substituted with international test assessment, pursuant to Cabinet Regulation No. 543 of 29.09.2015). Foreign language skills are necessary for elaboration of various course papers and final thesis. They are fundamental for a student to take an opportunity to participate in student mobility programmes. Since the study course offers engineering subjects, students must have appropriate basic knowledge which is shown by successfully passed centralised examination in mathematics. If persons who acquired their secondary education before 2004 or have been discharged from centralised examinations wish to apply for studies, they must submit the average annual grade in Latvian, foreign language in their diploma or a passed centralised exam as satisfactory proof.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

The courses are updated on the basis of recommendations and suggestions provided by Council Convent and basic guidelines elaborated by the Ministry of Agriculture "Basic guidelines for development and forestry and related industries 2015-2020." (https://www.zm.gov.lv/public/ck/files/ZM/mezhi/meza%20pamatnostadnes/Pamatnostadnes_2015_2020.pdf, only in Latvian) and according to Latvian forest policy

(<https://www.zm.gov.lv/mezi/statiskas-lapas/nozares-strategijas-politikas-dokumenti/latvijas-meza-politika?nid=328#jump>, only in Latvian). Coherence of study programme and relevant topics in the industry is discussed in meetings of various level where representatives from different businesses update the knowledge which would be needed by alumni. The programme director follows-up industry development trends and updates the course content in cooperation with other departments and courses. Student association "Šalkone" was also involved in improvement of study programme. The necessary changes were made in the courses pursuant to Article 56¹ of the Law On Higher Education Institutions (<https://likumi.lv/ta/id/37967-augstskolu-likums> or <https://likumi.lv/ta/en/en/id/37967>, only in Latvian). Study programmes are updated and improved on the basis of tasks put forth by LLU Development Strategy.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

By preparing a study plan for full-time and part-time studies (Annex 5), a principle of course succession is observed. Course content is taken as the basis to evaluate what knowledge is required to allow complete acquisition of them in the studies. For example, course Wood Science provides the basic knowledge to identify tree species and know their physical and mechanical properties as well as introduce to different parts of timber and their functions. A student needs this knowledge to acquire a course Wood Commodities Science where issues related to round timber are emphasized, and they consequently lay a basis for the first traineeship "Power Tools in Forestry". Before cross-cutting, the student must understand the right proportions based on optimum requirements for cross-cutting. The described research principles are observed also when elaborating other courses in the programme.

In order to avoid overlapping of study courses and to ensure knowledge succession in theoretical and professional courses and traineeship in industry, a regular audit takes place – lecturer of the course or traineeship introduces all academic staff to course content. It is organised as open sitting of department where the university lecturer concisely elaborates on the topic of their study course and related practical tasks. The discussion evaluates both content and if the particular course gives the required basic knowledge for the next course.

Additionally, the programme director evaluates overlapping of the course by means of mapping (Annex 4). Course mapping is rooted in the Profession standard. The mapping results in coherence of courses and topics and standard requirements in them,

In order to ensure the study process, supportive tools for better acquisition of the subject and online communication with course lecturer in e-studies are provided; e-studies contain regularly updated information about study literature and other activities where information exchange can take place in chats or forums. When starting the study course, students are introduced to the course content, volume of tasks to be carried out in the semester, evaluation system and other requirements and conditions.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

A degree in professional Bachelor study programme Forest Engineer can be obtained only by students who have a positive assessment of entire programme content. It means that a student has successfully passed all study courses, including free electives, traineeships and obtained positive assessment in pre-defense and defense of thesis.

Study process, i.e. duration of semester is defined in internal regulations of LLU. According to the Law on Higher Education Institutions, 40 CP is acquired in full-time studies, but less than 40 CP is acquired in part-time studies per academic year. Common structure of the study process is construed to make it understandable for a student.

When implementing the professional bachelor study program "Forest Engineer", the scope and evaluation methods of the full-time and part-time study program do not differ, which means that the content of the program provides the necessary set of knowledge, skills and competencies in accordance with regulations (Cabinet of Ministers Regulation No. 512). According to the Law on Higher Education Institutions, less than 40 CP are acquired in part-time studies in an academic year. The number of contact hours in part-time studies is determined by the LLU Study Regulations.

The implemented study program implements the principles of student-centered education, which means that:

- clearly achievable study course results and students are introduced to them in the first lecture, students know the program and study course defined results;
- the assessment system is designed so that the student has the opportunity to ascertain the level at which he / she has achieved the set learning outcomes (taking into account that students pay the most attention to assessment criteria, then this issue is discussed in detail in the first lecture);
- the lecturer, with the tools at his / her disposal, promotes the student's studies in order for him / her to achieve the set results;
- the student understands how the set of results of separate study courses forms the results of the study program;
- after the end of the study course students have the opportunity to give their assessment of the study courses; in addition - during the study process the director of the study program conducts discussions with students about the study process.

When starting a new study course, a university lecturer (university lecturers in some cases) explains the course goal, tasks and expected results, requirements to be met for a successful acquisition of the course and tests/exams, explains assessment criteria in more detail, informs students about consultation times and form. Approximately 45% of courses have an exam or a test at the end (LLU Study Regulation). Several methods are applied in delivery of courses. The students can improve and strengthen their knowledge and develop communication and argumentation skills by participating in seminars and reading papers and reports and also actively engaging in discussions.

Examples provided within the context of courses are topical events in the industry both in Latvia

and abroad. In order to provide students with topical information and provide general picture of demand for knowledgeable specialists in the industry to improve the course content, some lectures or courses are delivered by forestry specialists. Thus, students become more interested in processes happening in the industry and also argumentation for relevant knowledge is provided.

A possibility to receive accumulating assessment is considered a positive factor, which by all means also motivates a student to focus on studies.

In addition to studies, the students can also participate in organising and managing various events, such as “Forest Days” and “Scientists’ Night” thus improving their understanding of processes relevant for industry and improving the application of knowledge learnt in studies.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

There are 8 traineeships in general during the studies. Six of them are study traineeships and 2 of them production traineeships. Tasks of the study traineeships are related to deeper acquisition and strengthening of theoretical knowledge.

The goal of study traineeship “Power Tools in Forestry” is to strengthen the knowledge learnt in studies that are related to use of motorised tools in forestry (according to traineeship programme). Students strengthen the theoretical knowledge when working with motorised tools (chainsaw, brush cutting machine), get acquainted with occupational safety measures in harvesting (from work planning to a prepared or harvested felling area). Once the basic aspects of felling area management are acquired, students build skills in precise tree-felling techniques and rational cross-cutting of trees. It provides a better understanding of motorised tool operation in context of work environment requirements. Over the last years this traineeship has been considerably improved – department staff acts as a moderator and observer, while those providing practical training are certified and professional specialists of motorised tools. Among indirect benefits of the traineeship one can mention enriching students’ knowledge with evaluation methods and criteria used in EU.

The students of complex traineeship “Forestry” get a basic insight into forest botany, dendrology, forest regeneration, forest soil science, forest ecology and typology, forest protection, forest selection, silviculture, train to evaluate forestry impacts. In traineeship they also learn how to use hunting arms and tools and strengthen these skills in a course “Game Management”. Theoretical knowledge and skills acquired from practical classes.

Other study traineeships (“Land Surveying”, “Mechanisation of Forestry Works”, “Dendrometry and Forest Inventory” and “Logging Operations”) are delivered similarly – they correspond to course and traineeship programme and their goal is to strengthen and develop students’ knowledge and competences.

Production traineeships “Logging” and “Management and Economics” are delivered in forestry organisations and companies. “Logging” is split in two parts. The first part (3 calendar weeks) is organised in Ogre Vocational School where practical training and application of theoretical knowledge is carried out regarding preparation, adjusting and control of harvesting machinery in real circumstances of felling area. The second part (3 calendar weeks) takes place in a production

company, which provides an opportunity for students to get acquainted with organisation of forestation works, technical equipment and aspects of technological discipline in real life circumstances. In order to implement good quality and course-compliant traineeship, a traineeship specification has been elaborated and it is presented both to companies and students. Traineeship is concluded with a test – defense of traineeship report where the heads of Department of Forest Utilisation of LLU Forest Faculty, programme director and traineeship supervisor are taking part in and representatives from the related companies of the industry are invited. Defense is organised as a discussion, in parallel to testing the acquired knowledge in line with the specification of the chosen programme.

Traineeship “Management and Economics” envisages acquisition of practical knowledge about planning, managing and organising the forestry works and practical application of economic indicators, when adopting strategic decisions. Students must gather and analyse data on forest industry and organisation of forestry works to determine influencing factors and evaluate results of activities, which is a basis for students’ conclusions about possibilities to improve industry and company (organisation) and economic weight. Information about the industry and its organisation and stakeholders’ groups are provided to the students during the traineeship, and industry structure and involved parties are discussed. Students undergo practical part or individual traineeship as master’s assistants or apprentices by participating in production process. Students need to make decisions on different activities in their traineeships, for example, to check top-end wood-yard residues or evaluate impact of harvesting on environment. The tasks are based on knowledge acquired in the study traineeships which are then strengthened in the industry companies. Following the traineeship, students present what they have learned in the traineeship and provide recommendations on the necessary improvements. Traineeship report is assessed by the commission comprised of director of study programme Forest Engineer, the head of the Department of Forest Utilisation, dean, traineeship supervisor and representatives of involved companies or organisations. Over the last years two representatives from Joint Stock Company “Latvia’s State Forest”, two representatives from the Ministry of Agriculture and two from State Land Service participate in the defense of traineeship.

Each year, as the traineeship is concluded, programme director together with senior representative of the course discuss impressions encountered in the course, specifies shortcomings to be prevented, if any, and reviews students’ recommendations on improvement in traineeship or any other changes.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

The topics of Bachelor theses in the Professional Bachelor study programme Forest Engineer are chosen in the second semester of third year of full-time studies (Semester 6), whereas in the second semester of fourth year on part-time studies (Semester 8). Recent traineeship shows that students are entitled to choose a work topic of their interest and supervisor of thesis. Over the last five years, where a supervisor of thesis is a specialist forking for the forestry industry, another supervisor is assigned from the Forest Faculty. It is necessary to ensure the compliance with the procedure for elaboration of thesis under LLU Forest Faculty requirements laid down in “Structure and execution of study thesis”.

Once the topic or direction of the thesis and supervisor(s) is chosen, relevance of the topic and compliance with professional Bachelor's study programme Forest Engineer is discussed in an open sitting of Department of Forest Utilisation. Where necessary, prospective thesis supervisor is invited to substantiate the topicality of thesis and its relevance for forest industry. Once the topics are reviewed and specified, students start elaborating their theses in collaboration with supervisors. The supervisor of the thesis is responsible for thesis' quality and compliance with the basic information and methodological requirements. All theses elaborated during the last four years have been relevant for the forest industry. Work quality increases year by year, which is witnessed by the positive remarks from the State Examination Commission (VPK). A fact that part of the Bachelor theses is elaborated within the framework of some industrial project, including with cooperation partners of the Forest Faculty, for example, Latvian State Forest Research Institute "Silava" is evaluated positively.

Prior to defense in front of VPK, students have to do two pre-defenses, according to a calendar schedule of the Bachelor thesis elaboration in study programme Forest Engineer (Approved by the Council of LLU Forest Faculty). The volume of Bachelor thesis to be presented in the first defense is 60% which includes full abstract and methodology elaborated so far. Here a student is given a chance to present their achievements and also to understand and know how to answer the questions posed by pre-defense commission. Supervisors of theses and university lecturers from the Department of Forest Utilisation participate in this process. The second pre-defense is deemed to be a general rehearsal and 100% of the work must be done by then. University lecturers from the Forest Faculty and stakeholders participate in the process (if the supervisor of thesis comes from outside of the Forest Faculty). This approach is praised both by the university lecturers and students. It encourages the students to work systematically and timely, gives an opportunity to see also work of other students and listen to recommendations of university lecturers. At the same time also university lecturers learn about situation in topics beyond their courses thus promoting integrated approach to delivery of courses and elaboration of the theses.

Determines that up to 10 minutes for presenting the Bachelor thesis and up to 10 minutes for answering the questions are given for defense of theses in front of the VPK. The VPK members are first ones to ask the questions, followed by other participants of defense. The Department of Forest Utilisation recommends adding the leading industry companies or research institutions' representatives to the Commission's composition. Over recent years the Commission has only one representative from LLU Forest Faculty, and other members have been delegated from companies. Once all theses have been presented, commission members choose their assessment according to LLU Regulation. Students are informed about their assessments at the end of day (information with assessment placed in an envelope is handed out individually to each student). Over the last years (except for COVID 19 restriction period), the reviewers of theses must represent the forest industry. This work is voluntary and vivid interest from the part of forestry companies to engage in reviewing points at high quality of theses and their practical application.

In the process of defending the final theses with the evaluation "excellent" better results are shown in 2014/2015. and 2018/2019. study year (Tab.1). The development of such works is related to the topicality and practical significance of the chosen topics. In turn, since 2017/2018. the percentage of assessments for which the assessment is "very good" in the final thesis has decreased as a percentage of the study year. This is partly related to the improvement of the final work development requirements - the topic of the work should be described in sufficient detail in all chapters and pay more attention to the part of scientific literature and analysis, where the author compares his results with similar research in Latvia or worldwide.

Tab.1. Evaluations of final theses.

Tab.1. Evaluations of final theses.

Assessment	2019./2020.	2018./2019.	2017./2018	2016./2017.	2015./2016.	2014./2015.	2012./2013.
4 (almost average)	3	-	2	-	-	-	-
5 (average)	3	3	6	3	-	2	-
6 (almost good)	17	16	17	6	6	7	5
7 (good)	46	45	45	50	37	33	44
8 (very good)	29	26	22	38	52	46	41
9 (excellent)	3	11	8	3	6	13	10
10 (excellent)	-	-	-	-	-	-	-

According to the opinions of the State Examination Commission, the quality of graduation theses is growing every year. This is also justified by the general support of the industry, where students have the opportunity to collect the data set and other materials necessary for the development of the final work in production conditions, which directly increases the significance of the developed work.

When assessing students' choices in relation to the topicality of the thesis topic, several aspects must be taken into account. The process is organized in cooperation with the heads of departments, the director of the study program and the lecturers of the responsible department. This means that before starting the development, the student must first agree on the topic of the final work. In recent years, a system has been introduced that students fill in an online document that provides basic information about the potential final work: the title of the work, the set tasks and goals, as well as the hypothesis and the potential supervisor of the work. After the preparation of this information, an open meeting of the department is organized, where the potential topics of the bachelor's thesis and other basic information are considered. The topicality of the topic, possible solutions and recommendations for the development of the work and improvement or clarification of basic information are discussed. After receiving a positive decision, the student begins the development of the final work. Such a procedure takes time, but clearly the biggest benefit for the student is security and confidence that the State Examination Commission will not have questions about the topicality and significance of the work for the forest sector. The works in the study program are related to various aspects - with environmental issues, for example, "Analysis of forest fire dynamics in the protected landscape area of Slītere National Park", "Analysis of forest fire dynamics and their causes in Kurzeme and Zemgale"; with the construction and monitoring of forest roads, such as "Construction analysis of forest road" Autumn road "on low load-bearing soils", as well as current topics related to hunting issues, such as "Red deer (*Cervus elaphus* L.) browsing habits in young stands depending on the chosen pre-commercial thinning method in JSC "Latvian State Forests" in North Kurzeme region "; Topical topics related to forestry and logging, such as "Rutting dynamic on organic soils", "Evaluation of double bark thickness for Eurasian aspen (*Populus tremula* L) round timber", "Thinned Silver birch (*Betula pendula* Roth.) dendrometric indicators". In total, all 308 final theses have been developed at a high level and are available in the archives of the Faculty of Forestry

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

Recommendations from the convent and alumni are important for improving the study process as they notice in the work environment what additional knowledge and skills the forestry employees need. One of examples is a deeper understanding of various units and practical skills when operating manipulators. In order to provide students with a possibility to build not only theoretical knowledge but also promote their understanding of equipment operation and possibility to learn practical skills a decision was made to improve the study environment. A new and modern laboratory is almost completed in the premises of the Forest Faculty where students will be able to acquire the necessary knowledge and competences in using technologies in various courses (Forest Work and Machinery I, Mechanization of Forestry Work I and Mechanization of Forestry Work II, Innovations in the Forest Sector and Biomass Utilisation for Energy).

Regular cooperation with industry representatives, which are also employers, take place within the framework of study programme Forest Engineer. Industry representatives are in the Convent, NEC, and are invited as visiting lecturers, review theses, work in different action groups with representatives from the Department of Forest Utilisation, and it provides a platform for constant opinion exchange and there is no need to organise special surveys to find out opinions.

Students fill out questionnaires where they evaluate academic staff members in LAIS system according to LLU principle. Since filling out of the questionnaires is mandatory, the obtained information is not correct and will be used for further analysis. In order to improve the quality of elaboration of theses, the Department of Forest Utilisation created a questionnaire in academic year of 2019/2020 where students evaluate their cooperation with a supervisor, personal activity and contribution to thesis, as well as supporting and hindering factors when elaborating thesis. All employees from the Department of Forest Utilisation were introduced to survey summary and analysis of result and, according to student wishes, a decision was made on organising the first pre-defense earlier in next study year.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

Student mobility is ensured according to procedure dictated by LLU. Students can apply for a mobility programme in LLU International Cooperation Centre. Firstly, student and programme director jointly evaluate mobility prospects and fitness for study plan. In this process, within the framework of the mobility programme, study courses were found which match or stand closely to the selected programme in the Forest Faculty. The students are well equipped with fundamental knowledge to be able to participate in the mobility programme and study in another university. Students' interest in participation in the mobility programme varies (Fig. 2). It depends on different factors, for example, foreign offer's content, interest in particular country, culture and other events. Students consider safety issues very strictly before they choose to submit their applications and take on the mobility programme.

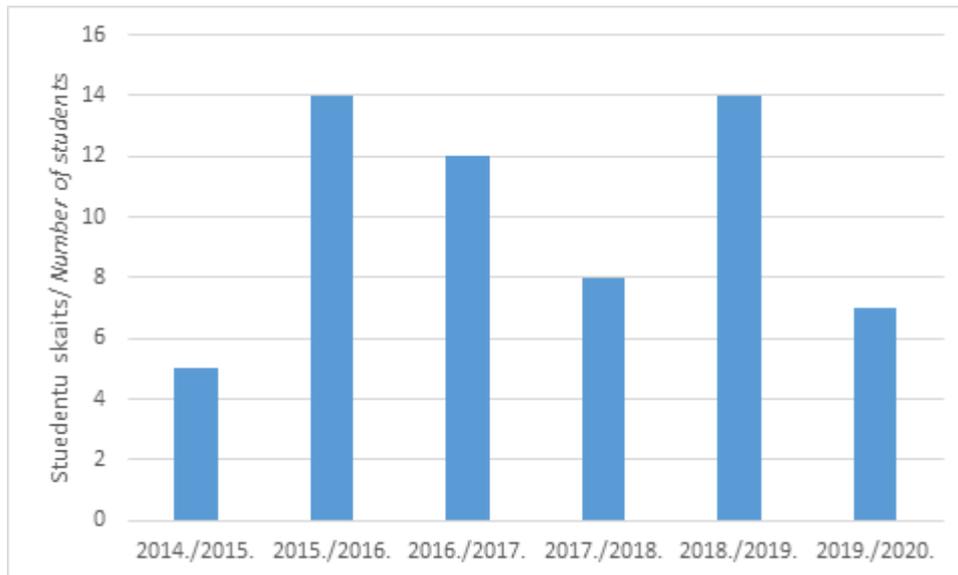


Fig. 2. Number of students in the mobility programmes, from 2014 to 2020.

Student survey shows that the most attention when choosing mobility programme must be paid to a country offering that programme. However, not all countries offer something suitable for the study programme Forest Engineer. The second decisive factor in choosing it was student feedback. Based on two said conditions - suitable programme content and recommendations - one can conclude that a list of most demanded universities involved in mobility programmes remain unchanged in long-term.

- Aristotle University of Thessaloniki;
- Czech University of Life Sciences;
- Mendel University in Brno.

Recently students' interest in University of Eastern Finland has decreased despite it offering rather high-quality studies and material base and also the largest producers of forestry machinery. When comparing the programmes, one can conclude that large attention in Finland is paid to work with different IT and data processing software. A challenge to the study programme Forest Engineer is to add latest technologies in forestry to the course programme so that students in future can choose also this programme.

Incoming student mobility in bachelor study programs at the Faculty of Forestry from 2014 to 2019, there are 19 students. It is not possible to separate the number of students by study programs according to the current data accounting. Foreign students do not choose a specific study program, but individual study courses that provide the necessary set of knowledge, mainly so that when returning to their university, it would be possible to equate semester to semester.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the

respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

The number of study places from public funding is harmonised in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Life Sciences and Technologies (LLU). It is defined in the trilateral contract on funding **for year of 2020** that the basic costs of one study place are 1,518.98 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Professional Bachelor's study programme "Forest Engineer" is 1.8 (ratios for each thematic education area vary, they are stipulated in the Regulations of the Cabinet of Ministers "Procedure according to which higher education institutions and colleges are financed from the state budget"), costs per one student of the Professional Bachelor's study programme "Forest Engineer" are 2,898.02 EUR.

Every year the LLU Senate confirms distribution of revenue and expenditure of LLU combined budget structure, which is prepared in compliance with the law "On the State Budget" passed by the Saeima, and annual order of the LLU rector "On Planning of LLU Combined Budget". The combined budget is controlled and audited by an external sworn auditor, whose opinion and report is reviewed and confirmed by the Senate.

Before the revenue and expenditure of LLU combined budget are approved in the Senate, it is reviewed, discussed and approved by the Action Group for Resource Utilisation and Development, which consists of the rector, vice-rectors, chancellor, Director of LLU, deans of all faculties, head/CFO of the Resource Accounting Centre, head of the Finance Planning Centre, chief economic officers, main specialists in the real estate and legal matters.

Distribution of revenue and expenditure approved in LLU Senate determines that 80% of the assigned state funding comprise remuneration and 20% comprise other costs. 60% of funds from paid studies are spent for covering remuneration costs and 40% - for other costs, 20% of which are in direct control of the Faculty delivering the relevant study programme. Volume of funding of the scientific base is calculated and granted annually depending on the active scientific work. Scientific base funding, amounting to 50%, can be spent by the Faculty, and 50% are intended for covering central costs. Scientific funding comprises the funds attracted for project implementation.

Distribution of joint LLU budget consists of estimates of structural units / faculties where costs are arranged by expense type. Percentage division of the costs of Bachelor's study programme Forest Engineer in 2020:

- Wages - 72%;
- Scholarships - 7%;
- Products and services - 17%, (incl. utilities - 6%);
- Building of the fixed capital - 4%.

State funding for professional Bachelor's study programme **"Forest Engineer" is as follows:**

In the trilateral contract on study programme funding **for year of 2019** the basic costs of one study place are 1,518.98 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor programme "Forest Engineer" is 1.8, costs per one student of the Bachelor programme "Forest Engineer" are 2,897.82 EUR..

In the trilateral contract on study programme funding **for year of 2018** the basic costs of one study place are 1,458.51 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor programme “Forest Engineer” is 1.8, costs per one student of the Bachelor programme “Forest Engineer” are 2,788.54 EUR.

In the trilateral contract on funding **for year of 2017** the basic costs of one study place are 1,393.33 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor’s study programme “Forest Engineer” is 1.8, costs per one student of the Bachelor’s study programme “Forest Engineer” are 2,672.13 EUR.

In the trilateral contract on study programme funding **for year of 2016** the basic costs of one study place are 1,333.11 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor programme “Forest Engineer” is 1.8, costs per one student of the Bachelor programme “Forest Engineer” are 2,190.93 EUR.

In the trilateral contract on study programme funding **for year of 2015** the basic costs of one study place are 1,333.11 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor programme “Forest Engineer” is 1.8, costs per one student of the Bachelor programme “Forest Engineer” are 2,191.05 EUR.

In the trilateral contract on funding **for year of 2014** the basic costs of one study place are 1,333.11 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor’s study programme “Forest Engineer” is 1.8, costs per one student of the Bachelor’s study programme “Forest Engineer” are 2,173.51 EUR..

In the trilateral contract on study programme funding **for year of 2013** the basic costs of one study place are 1,333.36 EUR, study level ratio for Bachelor programmes is 1 and social provision of the study place for Bachelor programme is 164.34 EUR, study cost ratio in education in the thematic area for Bachelor programme “Forest Engineer” is 1.8, costs per one student of the Bachelor programme “Forest Engineer” are 2,181.55 EUR.

During the reporting period, in order to provide the necessary knowledge in accordance with the demand of the Forest industry, intensive work is being done to provide the material and technical base. Forest industry professionals are involved in the study process to lead certain topics (guest lectures).

The largest investments in equipment development are in 2015, where 10 equipment was purchased, while in 2016, only 2 equipment was purchased. This is mainly due to the improvement of laboratories and the identification of the necessary equipment. Starting from 2017, investments to supplement technical equipment are increasing, namely, in 2017 6 equipment (mainly computer equipment), in 2018 16 units (mainly computer equipment), in 2019 one equipment, which is an unmanned aircraft control panel. Taking into account the rapid development of technology, it was necessary to arrange the unmanned aircraft required for the study process. In 2020, two equipment was purchased.

In order to fully implement the planned internships, the Forest Research Station provides support, for example, “Motor tools in forestry” provides the necessary equipment, as well as chainsaws and forest stands, where it is possible to strengthen the knowledge acquired during the study process. There is also a “Forest Taxation and Forest Management” provision, which is necessary for

conducting a forest inventory.

In 2016, the Faculty of Forestry received support for equipping the computer class with Timber Office, TimberMatic H-12 and TimberMatic F-12, which provides an opportunity to improve knowledge for job preparation for the harvester, as well as analyze the prepared volume and productivity both by technical units and forest machine operators. In addition, it is also possible to improve knowledge in making technical settings - in the simulator. In cooperation with the branch company SIA "INTRAC Latvija", the Faculty of Forestry received 3 harvester simulators for one semester, until then only one simulator was available to the Faculty of Forestry, which is intended for approbation of working methods and technology used in the delivery process.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

The basic composition of academic staff is stable and does not change during the academic year. Over the last five years several university lecturers have terminated their work due to retirement and career development.

When attracting new academic staff members, not only education but also work experience in forest industry is taken into consideration. There are several academic staff members who are not only university lecturers for the courses but also work for a forestry company. University lecturer who deals with the topics in this programme on a daily basis started to deliver courses Dendrometry and Forest Management in academic year of 2020/2021. It means that students will benefit not only from high level theoretical knowledge, but it also provides a direct link to traineeship and forest industry. Modern software will be gradually introduced to the mentioned courses which is used in the industry only for some years - LVM GEO.

Visiting lecturers from other LLU structural units of the industry are invited to cover specific topics. As of academic year of 2020/2021, also visiting professors come to deliver study programme Forest Engineering.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and

the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Requirements for academic staff involved in delivery of study programme are laid down in Article 39 of the Law on Higher Education Institutions (<https://likumi.lv/ta/id/37967-augstskolu-likums> or <https://likumi.lv/ta/en/en/id/37967>, only in Latvian).

According to “Forest Faculty Strategy (Forest Faculty Strategy – action plan 2020-2024), different activities are organised so that the academic staff and other academic staff members could develop their knowledge, skills and competences. The academic staff members develop their professional, teaching and other knowledge in various seminars and courses on a regular basis. It must be marked that professional development activities are organised to expand knowledge and perspective on industry topicalities in general rather than academic staff’s competences regarding courses to be delivered. All academic staff members of the programme must be knowledgeable in issues related to programme to actively participate in managing, consulting and assessment of final thesis.

Competences necessary for the courses to be delivered are supplemented individually. Part of them work in the industry and source additional information from colleagues. Majority of university lecturers attends special professional development courses, seminars or participates in conferences. Since 2020, competences are supplemented within the framework of various internship programmes in forestry companies.

University lecturers of the programme actively engage in preparing the text-books, write publications and partake in projects. For example, course Biomass Utilisation for Energy is delivered by an academic staff member whose research activity is related to work in LVMI “Silava” and who participates in projects and scientific work that corresponds to the content of the course for 80%. Therefore, it is possible to ensure not only acquisition of theoretical knowledge, but also provide students with competent knowledge on the most topical research and their results. Traineeship “Dendrometry and Forest Inventory” is delivered by certified dendrometry specialist. Professionalism of the academic staff members involved in the study process is evaluated as high, and it is indirectly shown by an increase in demand for full-time studies and also constantly high interest about part-time studies.

In the implementation of the professional bachelor's study process, 3% of lecturers have a bachelor's degree, 47% have a master's degree and 50% have a doctor's degree. Forest-related courses are mainly taught by teachers related to the forest sector, which means active participation in science or participation in production processes. The results of the lecturers' academic, scientific and organizational work are summarized once a year and reports are prepared, which are also related to the motivation principles developed by the Latvia University of Agriculture. The performance and achievements of the lecturers are included in the personal CV.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

Intensive activity of the academic staff members in relation to measuring and quality assessment of round timber can be related directly to knowledge transfer to the study process both to improve theoretical knowledge and guiding the students into research. Relevant topics of theses are offered to students (one of project tasks) which they can solve by applying the same methodology and instrument. After collection of data and further processing the students can compare results and get consultation where needed. Elaboration of such theses is deemed to guide students into research, which obviously demonstrates the role of data collection according to methodology and versatility of instruments used and a possibility to evaluate costs. An example of best practice is students' involvement in project "Impact of the size and number of cargo on tyre track formation in the main felling areas on organic soils". One of students involved in it graduated from the faculty and continues working in the industry, and the second one plants defending his thesis in academic year of 2020/2021. Direct involvement of students in project implementation was possible by ensuring active cooperation with academic staff members/researchers while processing and collecting data.

Similar examples of student involvement are also related to topics on timber increase, game management or CO₂ emissions.

During the reporting period, the teaching staff is involved in various scientific research activities as participants or managers of institutional projects and programs. The projects are implemented together with industry organizations, such as SIA "Metrum", JSC "Latvijas valsts meži", Forest Industry Competence Center, SIA "Rīgas siltums" and other representatives of the Forest Industry. During the reporting period, lecturers have also been involved in international projects, as well as in State research programs. An integral part is scientific activities, including conducting international scientific conferences, which are organized in Latvia.

The involvement of the lecturers of the study program in the projects (management or participation) is reflected in the CV of each person.

4.6. Assessment of the cooperation between the teaching staff members by specifying the

mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Evaluation of the academic staff members is based not only on intense activities in the industry or science, but also on student evaluations at the end of each semester. Since student participation in evaluation is voluntary and questionnaires are filled out only by small number of students, the evaluation is considered to be biased.

Compliance of the academic staff members is evaluated before delivery of each course or starting employment. One of the basic requirements is compliance with the Law On Higher Education Institutions, besides the work experience plays a major role in delivery of professional study programme. Apart from the existing experience also the systematic approach to professional development and widening of horizon in other areas is evaluated additionally.

Visiting lecturers are invited to deliver individual topics in more detail in some courses. This cooperation model is positively evaluated also by students. Inviting visiting lecturers for individual classes is an initiative taken by the academic staff members and they must previously coordinate it with the study programme's director and head of department.

In order to avoid duplication of the content of the study course, the cooperation of the academic staff is organized at least once a year as an open meeting of the department (that is, all lecturers of the Forest Faculty may participate). In general, the study courses included in the programs are designed with the idea that they complement each other and do not repeat.

74 university lecturers are involved in the study programme, equalling to 11.26 workloads. Student : academic staff ratio is 23.4 : 1.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	1_Annex_changes-in-the-number-of-students_EN_prec.pdf	1_pielik_statistika-par-studejosajiem-parskata-perioda_LV.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	2_Annex_compliance-with-the-national-education-standard_EN_prec.pdf	2_pielikums_atbilstiba-valsts-izglitiba-standartam_LV_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)	3_Annex_match with the professional standard_EN_prec.pdf	3_pielikums_atbilstiba-pret-profesiju-standartu_LV_prec.pdf
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	4_Annex_mapping of study courses_EN_prec.xlsx	4_pielikums_studiju-programmas-kartejums_LV_prec.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	5_annex_Study-plan_full-and-part-time_Mezinzeris_bak.rar	5_pielik_Studiju-plans_PL_NL_Mezinzeris_bak.rar
Descriptions of the study courses/ modules	6_Annex_study-cours_EN.rar	6_pielikums-studiju-kursi_LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikums_Mezinz_en.rar	Diploms-un-pielikums_Mezinz_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education		
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.		

Agriculture (42621)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Agriculture</i>
Education classification code	<i>42621</i>
Type of the study programme	<i>Professional bachelor study programme</i>
Name of the study programme director	<i>Dace</i>
Surname of the study programme director	<i>Siliņa</i>
E-mail of the study programme director	<i>dace.silina@llu.lv</i>
Title of the study programme director	<i>Dr. agr.</i>
Phone of the study programme director	<i>29821882</i>
Goal of the study programme	<i>To provide students with the basic professional theoretical knowledge in agricultural science, including theoretical and methodological basis of agricultural science and related sciences, simultaneously students solve topical theoretical and practical problems of agricultural science individually, applying the acquired knowledge in practice and research.</i>
Tasks of the study programme	<p><i>Tasks are to provide the theoretical knowledge and practical skills planned in the study program so that graduates can successfully work in the following directions:</i></p> <ul style="list-style-type: none"> <i>• agricultural production and processing enterprises;</i> <i>• pedagogical and scientific work;</i> <i>• in the advisory service;</i> <i>• environmental protection institutions;</i> <i>• state self-government and administration;</i> <i>• in public and political organizations.</i>

Results of the study programme	<p><i>Agronomist with specialization in Field Crops or in Horticulture</i> Graduates have acquired knowledge in chemistry, physics, biometrics, biology, plant and animal physiology, agricultural business and law, psychology, foreign language, and other general education courses; knowledge of biological characteristics of field crop and horticultural species, varieties and their suitability for producing certain products or processing; crop growing technology; evaluation of cost-efficiency of an applied technology. Graduates are able to work independently and creatively; self-educate; use recent research findings in the industry to improve production technologies; appreciate the importance of sustainable agricultural production and its unity with the environment; independently acquire the necessary skills in specialization; comply with the laws and regulations of the European Union and the Republic of Latvia in agricultural production; gather, systematize and analyze data; use special literature in the subject field of agriculture. Agronomists are competent to organize agricultural production, they are familiar with laws and regulations related to agricultural industry; they are competent to assess risk factors and competitiveness in the industry; regularly organize relevant training seminars for subordinate staff members or inspect them, to continue studies in the master's degree programme.</p> <p><i>Zootechnician in Breeding</i> Graduates have acquired knowledge in chemistry, physics, biometrics, biology, plant and animal physiology, agricultural business and law, psychology, foreign language, and other general education courses; knowledge of biological characteristics of farm animals and their suitability for producing certain products or processing; farm animal breeding, feeding and housing technologies; evaluation of cost-efficiency of an applied technology. Graduates are able to work independently and creatively; self-educate; use recent research findings in the industry to improve production technologies; appreciate the importance of sustainable agricultural production and its unity with the environment; independently acquire the necessary skills in specialization; comply with the laws and regulations of the European Union and the Republic of Latvia in agricultural production; gather, systematize and analyze data; use special literature in the subject field of agriculture. Zootechnician in breeding are competent to organize agricultural production, they are familiar with laws and regulations related to agricultural industry; they are competent to assess risk factors and competitiveness in the industry; regularly organize relevant training seminars for subordinate staff members or inspect them, to continue studies in the master's degree programme.</p> <p><i>Manager of an Agricultural Company</i> Graduates have acquired knowledge in chemistry, physics, biometrics, biology, plant and animal physiology, agricultural business and law, psychology, foreign language and other general education courses; knowledge of biological characteristics of field crops, horticulture crops as well as livestock species, varieties and their suitability for producing certain products or processing; techniques of growing and caring of crops and farm animals; evaluation of cost-efficiency of an applied technology. Graduates are able to work independently and creatively; self-educate; use recent research findings in the industry to improve production technologies; appreciate the importance of sustainable agricultural production and its unity with the environment; independently acquire the necessary skills in specialization; comply with the laws and regulations of the European Union and the Republic of Latvia in agricultural production; gather, systematize and analyze data; use special literature in the subject field of agriculture. Manager of an Agricultural Company are competent to organize agricultural production, they are familiar with laws and regulations related to agricultural industry; they are competent to assess risk factors and competitiveness in the industry; regularly organize relevant training seminars for subordinate staff members or inspect them, to continue studies in the master's degree programme.</p>
Final examination upon the completion of the study programme	Bachelor Thesis

Study programme forms

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	4
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Agronomist with Specialization in Field Crops</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Part time extramural studies - 5 years - latvian

Study type and form	<i>Part time extramural studies</i>
Duration in full years	5
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Agronomist with Specialization in Field Crops</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	4
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Agronomist with Specialization in Horticulture</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	4
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Zootechnician in Breeding</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	4
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Manager of Agricultural Enterprise</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

Part time extramural studies - 5 years - latvian

Study type and form	<i>Part time extramural studies</i>
Duration in full years	5
Duration in month	0
Language	<i>latvian</i>
Amount (CP)	160
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>

Qualification to be obtained (in english)	<i>Agronomist with Specialization in Horticulture</i>
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Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Part time extramural studies - 5 years - latvian

Study type and form	<i>Part time extramural studies</i>
Duration in full years	<i>5</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>160</i>
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Zootechnician in Breeding</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

Part time extramural studies - 5 years - latvian

Study type and form	<i>Part time extramural studies</i>
Duration in full years	<i>5</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>160</i>
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Bachelor Degree in Agriculture</i>
Qualification to be obtained (in english)	<i>Manager of Agricultural Enterprise</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

The admission requirements have changed (see Table) in the programme parameters since the last accreditation, other parameters have not changed.

Parameters	Parameters
<i>Name of the programme</i>	Professional Bachelor's study programme "Agriculture"
<i>type and form of studies</i>	Full-time studies and part-time studies
<i>volume in credits</i>	160 credits
<i>instruction language</i>	Latvian
<i>degree / qualification to be conferred</i>	Professional Bachelor Degree in Agriculture and qualification of Agronomist with Specialization in Field Crops or Horticulture or Zootechnician in Breeding or Manager of Agricultural Enterprise
<i>admission requirements</i>	General secondary education or vocational education. Compulsory: Centralized exam (CE) in Latvian, in a foreign language, in mathematics; CE in biology or final mark (GA) biology (may also be agrobiolgy or forest biology) or natural sciences Additionally: CE or GA in chemistry

Admission requirements are supplemented with "agrobiolgy or forest biology", taking into account the subjects acquired in general secondary education or vocational secondary education (the content of the subjects "Agrobiolgy" and "Forest biology" was compared with biology and found to be appropriate).

Admission requirements:

<https://www.llu.lv/lv/pamatstudijas#uznemsana> (only in Latvian).

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Number of students studying in the Faculty of Agriculture, professional Bachelor's study programme in full-time and part-time studies mainly fluctuated in the reporting period (the lowest total number of students was 264, the highest – 378). Increase in the number of full-time students was observed in academic year of 2014/2015 (264), followed by a decrease year by year (187 full-time students were recorded on 1 September 2020). Number of students in part-time studies augmented until the academic year of 2015/2016, and for the next four years it remained the same with small changes, and then again it dropped in academic year of 2020/2021. (Annex 4).

Dropping number of students is a consequence of several factors – demographic situation in Latvia and general trend where number of employees in agricultural fields decrease in EU and Latvia alike. It is related to development of science, modernisation of technologies and growing popularity of robotics used in the agricultural production. It indirectly points at a need for highly qualified specialists. In relation to aforesaid, in years to come, it is not possible to prognosticate an increase in the number of students, one can expect the number of students to stabilise and focus on permanent improvement of study quality.

Judging from regular first year's student surveys which are conducted on a regular basis, 67 to 78% of first-year students had clearly decided on their profession upon graduating from the secondary school. Persons who see a potential in this education, whose family members have studied here, or who are already engaged in agricultural production, who have heard good feedback about the study programme and faculty, who find the studies to be interesting and see career perspective in them choose to study agriculture.

In general, ratio of full-time and part-time students in the reporting period was 71:26 to 65:35, expressed in percentage. Majority of students studied for state budget (65 to 82%), and 7 to 16% of students paid for their full-time studies from own pocket. Part-time students pay for the studies themselves.

When analysing by gender category, agricultural studies are mainly chosen by men, and less than half of students admitted in the reporting period was female (from 26 to 49%).

Two to 23% of students in the reporting period started studying at later study phases. The reasons were different – academic leave of absence, discontinuation of studies due to work or family situation, change of study programme (students from other programmes start studying in agriculture), etc.

48 to 63% of students who are admitted graduate from studies. The main reasons for discontinuation of studies were inability to comply with programme's requirements (understanding that agricultural studies are not easy), failing to organise themselves for an independent work, failing to balance studies with work, due to change in family situation, also due to financial considerations. 15% of students from the number of students in the reporting period discontinued studies (53% of them from full-time and 47% of them part-time).

LF statistics data on students in the professional bachelor's study program are in Annex 4.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

The professional bachelor's study program "Agriculture" is a so-called "umbrella type" program, where obtaining one degree (Professional bachelor degree in Agriculture), can additionally obtain one of four qualifications: 1) Agronomist with a specialization in Field crops or 2) Agronomist with a specialization in Horticulture, or 3) Zootechnician in Breeding or 4) Manager of Agricultural Enterprise.

The professional bachelor's study program provides both the acquisition of theoretical study courses in the bachelor's part and special study courses in accordance with the chosen qualification and specialization direction, as well as extensive professional practice that ensures the link between theory and practical production. Taking into account the above, students can change the direction of specialization after the first year of study, thus in any case achieving the set goal of the study program, fulfilling the tasks and achieving the set results.

The corresponding professional standards were approved by the Cabinet of Ministers on 18 May 2010. No. 461 "Noteikumi par Profesiju klasifikatoru, profesijai atbilstošiem pamatuzdevumiem un kvalifikācijas pamatprasībām un Profesiju klasifikatora lietošanas un aktualizēšanas kārtību" (with amendments), only in Latvian.

Coherence of study programme's name, degree to be obtained and professional qualification, as well as goals and tasks of professional qualification and admission prerequisites has been examined in more detail when elaborating the programme in 2010, it was regularly assessed in delivery period and reviewed in 2019 after a project "Improvement of Administration of the Latvian University of Agriculture" was implemented by LLU within the framework of the project No. 8.2.3.0/18/A/009, where industry experts were involved in assessment of programmes ("Provision of industry expert services for assessment of programme content and provision of recommendations within the framework of the project No. 8.2.3.0/18/A/009"). Courses were examined according to the internal regulatory documents of LLU, which led to updating of attainable results and requirements for credit points.

The goal of programme is to provide students with fundamental professional knowledge in agricultural science, including theoretical and methodological basis of agriculture and related scientific disciplines, at the same time enabling students to solve relevant theoretical and practical problems of agricultural science independently, and taking care of practical application of this knowledge to practice and research. Hence, highly qualified agricultural experts with comprehensive body of knowledge, skills and competences are prepared according to their professional activity and who are able to:

- use conclusions of modern scientific field to improve industry's production technologies;
- understand the role of a sustainable agricultural production and its harmony with environment;
- acquire the necessary practical skills in a particular direction of specialisation independently;
- continue studies in graduate programme.

Admission requirements stated for the study programme Agriculture (CE in biology or yearly assessment in biology (can be also agrobiolology or forest biology) or natural sciences) ensure successful studies in agriculture regardless of the chosen qualification..

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

The content of study courses is created, looking at the needs and specifics of the agriculture as a production industry, basing both on development of agriculture and related industries and labour market development.

According to internal documents of LLU, the course programmes are reviewed and updated at least biannually, adding the most urgent topics and issues.

Research conducted by and experiment results achieved by the academic staff (academic staff members and leading researchers) is a considerable contribution to agricultural industry and also development of study programme and content improvement. Often, not only academic staff of the agricultural industry, but also scientists from other industries (veterinary medicine, food production and economics) are involved in implementation of scientific projects, and it allows delivering the study course from different perspectives.

The academic staff members prepare scientific articles, participate in conferences, scientifically applied and practical seminars, and not only participate but also organise the rural days, elaborate methodological study materials, prepare text-books and monographs.

Entire content of study courses is reviewed on a regular basis, taking into account several aspects. Updating and development of study course content takes place on the basis of:

- Student surveys:
 - when providing an evaluation of each particular study course once it is acquired (a survey questionnaire is available in LLU Information System where a student evaluates content of study course, methods applied (whether they encouraged course acquisition); ability of academic staff member to engage students and other indicators, and they can also provide their commentaries / proposals and evaluate their engagement);
 - at the end of studies, a graduate survey takes place, where the alumni evaluate study programme in general and particular study course;
- development trends on certain topics included in the study course, taking into account recommendations from the industry's representatives or traineeship supervisors; discussions at national and international scale – in conferences, symposiums, seminars, webinars, project meetings, sittings of industry associations / societies etc.
- proposals from study programme's director and heads of sub-directions, which are reviewed in the sittings of faculty's Methodological Commission of Studies;

- expert recommendations. The study programme was analysed in 2019, within the framework of project No. 8.2.3.0/18/A/009, involving an industry expert from Agriculture Organisations cooperation council and professor from Helsinki University as experts. Experts evaluated the study programme positively, and it is equalled to similar study programmes abroad. Some expert recommendations have already been introduced. For example, experts recommended to organise traineeships during the high season, to an extent possible, so that the students can get an experience of consulting work. This recommendation is already being implemented in the study process, because the professional traineeships are split, taking into account both professional considerations (for agronomists – beginning of vegetation period, also period of active vegetation) and laws and regulations (organisation of study process) (for implementation of expert recommendations refer to Section 2);
- Based on survey results “Survey on trends of demand for labour force within the framework of project No. 8.2.3.0/18/A/009”, processed by “Dynamic University” Ltd.

The academic staff members, programme director and faculty management, based on survey results, evaluation, expert recommendations, discussions or results of surveys, consider possibilities to improve course content and implementation thereof, by reviewing and changing the course volume where necessary.

Based on previously mentioned, content of existing courses and new study courses are created taking into account topicalities in the industry and recommendations from the employers.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

Course programmes are elaborated according to the goal, tasks of programmes and defined study results, which are determined by LLU internal regulatory documents and relevant profession standard.

Study programme includes: generally educative and industry’s theoretical courses; industry’s professional specialisation courses according to the chosen study direction; traineeship programmes harmonised in advance with previously acquired courses; professional traineeship which strengthens theoretical knowledge in practical application; and Bachelor thesis, elaboration and defense of which is closely linked to programme’s goals and attainable outcomes. The aforementioned allows obtaining a Bachelor Degree in Agriculture and relevant qualification.

Coherence of courses is encouraged also by the sequence of acquisition, because successful acquisition of professional courses is rooted in generally educative and industry’s theoretical courses.

The aim of the study program is the same for all specialization directions, the most significant difference is in the results to be achieved in the specialization direction “Manager of Agricultural enterprise”. In the direction of this specialization, students also study special study courses in the field of field crops, horticulture and animal husbandry, thus being able to manage and organize agricultural production also in multidisciplinary farms or companies.

Mapping of study courses reflects coherence and compliance of each course with the programme's goal and attainable outcomes.

One of outcomes of the programme is ability of alumni to gather, systematise and analyse data, work independently and creatively. Students develop the mentioned skills by participating in the research programmes headed by the supervisors of their theses or conducting research in agronomy or animal husbandry in production conditions under the lead of their thesis supervisor. Research results are annually presented in the scientific conference of LF graduate students and students "Diverse Agriculture", preparing also the theses on their research (theses have been published electronically since 2018, <http://www.lf.llu.lv/lv/studentu-konference>, only in Latvian). Students can also participate with their reports in the international student conference "Students on their Way to Science" organised by the university (since 2014 <https://www.sws.llu.lv>). Participation in conference develops students' ability to prepare a presentation in a focused manner and a summary on the topic of their thesis, ability to present and answer the questions with substantiation. In employers' surveys these skills are indicated as among the most important.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

The study program is implemented in full-time and part-time studies. Based on the criteria specified in the Law on Higher Education Institutions, in the academic year students acquire 40 credit point (CP) in full-time studies and less than 40 CP in part-time studies. According to the Cabinet of Ministers Regulation No. 512, not less than 40% of the volume of the bachelor's study program consists of contact hours.

According to the LLU Study Regulations, full-time studies are a form of studies in which the amount of lesson for 1 CP is not less than 16 contact hours. Part-time studies are a form of studies in which the student acquires a part of the content of the study program independently and the amount of lesson for 1 CP is up to 8 contact hours.

Studies are delivered in a form of lectures, seminars, practical / laboratory works and independent works of students. All LLU resources (multimedia projectors, microscopes, which are connected to computer and screen, e-studies platform, video lectures online) are used for on-site classes.

During the studies the students can engage in discussions, ask questions both during and outside classes (consultations, e-mail, calling, e-studies platform). In some courses problem solving approaches are employed. Study materials (lecture materials as presentations or records), practical and laboratory tasks and descriptions etc.) and auxiliary materials for students are available also in e-studies. Materials for self-guided learning (for example, control questions, homework etc.) are available in e-studies platform.

Criteria of study delivery and assessment comply with:

- Cabinet of Ministers Regulation No. 512 of 26 August 2014 "Regulation on national standard of second-level professional higher education",
- Cabinet of Ministers Regulation No. 240 of 16 May 2014 "Regulation on national standard of

academic education”, which lays down the principles of mandatoriness, assessment review possibility. The principles are described in LLU Study Regulation (10.06.2015 LLU Senate Resolution No. 8-182 of 10.10.2018. Amendments to the Senate Resolution No. 9-162, <https://www.llu.lv/index.php/en/study-guide-documents>), and principle of diversity of evaluation forms in the assessment is described in course programmes.

Studies for LF full-time students are planned centrally at LLU, but for part-time students studies are planned at the faculty, taking into account the amount of contact hours set by LLU 1 CP. Part-time studies are implemented in the form of sessions, in each semester contact classes are planned twice in two weeks.

Methods for assessing the courses were chosen on the basis of knowledge necessary for performing the basic tasks in the professional activity as stated in the profession standard at the level of understanding and application and are the same in full-time and part-time studies..

Procedure for assessment of course results is integrated in every course description (in compliance with Study Vice-rector Resolution No. 2.4.-5/44 of 28.08.2018 “On procedure of elaboration of course/traineeship programme and procedure for registering and updating the information in LLU IS Course Register”. Assessment system and evaluation of student progress are elaborated by university lecturer or lecturers of a particular course. Criteria for successful acquisition of a course is participation in seminar discussions, class attendance, elaboration and successful defense of practical /laboratory / independent works and papers etc. The course programme also describes conditions of getting cumulative assessment and student conduct in case the conditions for assessment are not fulfilled. Before attending course lectures, the students can read about assessment criteria and conditions in the course catalogue, and an academic staff member in the first lesson introduces students to conditions on successful acquisition of the course. Information about conditions of the acquisition of study course is available on LLU e-studies platform.

An academic staff member can create an assessment book in e-studies platform (estudijas.llu.lv) where he or she enters assessment of independent, practical, laboratory work or seminar intended in the course in 10-point system, pass/fail assessment or points indicated in the course. Thus, students can follow-up their study progress.

Faculty of Agriculture pursues student-centred approach:

- Course outcomes are clearly defined, students are introduced to them, and students put all their effort to attain them;
- Students know and understand the defined study results (both those of the programme and the course);
- assessment of learning outcomes is designed to allow checking whether and to what degree the learning outcomes are attained.
- The study process focuses on a student who can study independently.
- one can understand how a set of individual courses lead to outcomes of the programme;
- an academic staff member puts all their efforts to promote student’s work and achieve the proposed learning outcomes;
- at the end of the course, students evaluate it.

Results of the study programme are defined and they:

- create a uniform understanding for students and academic staff of the expected outcomes at the end of each particular course and programme,
- are an instrument for academic staff member to organise more efficient study process by choosing appropriate teaching methods, topics and materials;
- create a mutual understanding and comprehension among colleagues at the faculty and

university regarding the attainment of course and choosing of particular method;

- allow comparing courses and their compliance with the programme and identify aspects / topics where some content and results overlap or are missing;
- provide information to employers about knowledge and skills according to the qualification involved.

Delivery and assessment methods applied to the programme promote attainment of course and programme's goals and results.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

The Professional Bachelor's study programme offers traineeships every year: the first study years they have traineeships with tasks and content closely related to the goal and results of the programme, in the third study year's spring semester and last study year's autumn semester students undergo individual traineeship in industry's companies to apply their theoretical knowledge to real-life situations.

Organisational aspects of the traineeship are regulated by LLU Traineeship Regulation (available at <https://www.llu.lv/en/study-guide-documents>), it is delivered according to a traineeship programme and division of study year, which is approved by LLU Study Council.

Study traineeships (Practical Rural Management 1 KP, Basics of Agriculture 2 KP, Agronomy 3 KP) are supervised by the academic staff members both in laboratories and in one of LLU training and research farms (MPS "Pēterlauki" and SIA "LLU MPS Vecauce") and also industry's companies (study visits). Traineeship coordinator is an academic staff member responsible for each traineeship and cooperates with all the academic staff members involved to create a study traineeship plan, coordinates and supervises it.

Students are assigned to a professional traineeship with a dean's order and on the basis of a trilateral agreement signed among the university, traineeship provider and student. The traineeship agreement states the main obligations and rights, traineeship supervisors from the faculty and from the traineeship provider. A student must present traineeship programme to the traineeship provider and agree on a successful performance thereof.

Students have freedom in choosing the traineeship places when it comes to professional traineeship, whereas the traineeship coordinator, programme director and sub-direction heads may recommend the most suitable traineeship provided judging from the previous cooperation, experience and contacts in the industry. Companies also inform about traineeship opportunities. Information about traineeship providers are gathered and published in faculty's dean office, it is sent to students in e-mail and/or published on LLU website, Work and Traineeship Offers (https://www.llu.lv/lv/darba_piedavajumi/view_work and <https://www.llu.lv/en/job-offers>) section.

Potential professional traineeship providers are agriculture enterprises, consultation service, companies and establishments related to agricultural services, professional organisations, scientific institutes, public administration companies.

Students may use the opportunities offered by the exchange programmes ERASMUS+ and undergo traineeship outside Latvia for at least two months. In this case too, students chose their traineeship provider individually or at a recommendation of a coordinator, programme director or head of sub-direction. In the reporting period the students have taken opportunities of ERASMUS+ and also private contacts when heading for professional traineeship to Germany, Norway, Canada, South Africa, Spain and other countries.

Before signing of a trilateral contract, students present traineeship programme and expected outcomes to a potential traineeship supervisor, harmonise it and report about prospective traineeship provider to the traineeship coordinator. If the chosen place of traineeship is not suitable for the traineeship programme, a student can change it by consulting and harmonising it with traineeship coordinator at the faculty.

During the professional traineeship students prepare intermediary report, gather and describe collections (depending on qualification), prepare the final traineeship report. Traineeship coordinators randomly visit students at their traineeships by coordinating it previously with the traineeship provider. During the traineeship students attend professional seminars, rural days and professional exhibitions of the industry.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

The Bachelor thesis is elaborated at the end of undergraduate studies, on the basis of results of a trial, research or an experiment. Within the framework of a (Bachelor) thesis, students do the research, observations, experiments, evaluate ecological and economical aspects thus involving some interdisciplinary aspects. Topics of theses are very versatile. The main directions of the research field related to microorganisms and invertebrates (*Rhizobium spp.*, mycorrhiza fungi, interaction among various microorganism groups, life cycle of microorganisms, pathogenic fungi, pest invasion and natural enemies of pests etc.) significant in agriculture), role of pollinators, bee-keeping, plant productivity (field crops, garden plants) and factors influencing the harvest quality, environmentally-friendly growing technologies, soil research, animal productivity and functional efficiency, research of animal welfare, adaptation and behaviour etc.

Students can choose their topics of Bachelor thesis according to their interests or to elaborate topics offered by the faculty both within the framework of scientific projects and in a specially arranged experimental study and research or production farms. Potential topics of the theses are specified by the faculty each year. Students are also informed about possibilities to elaborate their theses in the institutes under the auspices of LLU (Institute of Horticulture , Institute of Agricultural Resources and Economics). Supervisors of the theses are academic staff members of the faculty; when elaborating a thesis in any of scientific institutes, the second supervisor or consultant is the leading researcher or a researcher of the institute.

The final examination of the programme is an elaborated, reviewed and publicly defended Bachelor thesis in front of the Commission. The State Examination Commission (VPK) consists of industry's representative and faculty's academic staff members, the chairman of the Commission is industry's representative. The final assessment consists of an assessment from the reviewer and 7 members of the Commission. The VPK notes that the topics of Bachelor theses are related to current topicalities in the industry, with a practical focus, with a meaning, and solving topical problems and

issues in a particular company / farm.

During the reporting period, the average bachelor thesis evaluation was 7.3 (in the range from 6.9 to 7.8, there were differences both by years and specialization directions). The final work with "excellent" (10) was evaluated for 5 students, which is only 1%. Grade 7 was 31.4%, 8 - 24.8%, 9 - 19.5%. Very few (5.4%) final theses were assessed as average (5).

As mentioned above, the assessment of the theses is very diverse (from average to excellent), however diversity points at student's ability to focus on the thesis when elaborating it, when gathering data, when planning their time for a professional description and focusing while presenting and defending, ability to correctly narrate the results of their research/trial in a limited time, to substantiate, discuss and defend their standpoint.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

Several surveys take place while delivering the programme, and they allow analysing students' readiness for studies, quickly respond to difficulties (student survey in the 1st study year, once they have spent 1, 2 and 3 months studying) and evaluate student opinion, suggestions and recommendations in study process.

During the studies the students have several opportunities to evaluate study process, to express their opinion and come up with proposals: evaluation of individual courses (at the end of semester evaluate particular courses (including traineeships) via electronic assessment system LLU IS) and evaluation of the programme (alumni survey after defense of the thesis). Evaluation of each particular study course can be reviewed and analysed both by university lecturers of particular courses and programme director. A survey summary is discussed and analysed by faculty's Methodological Commissions of Studies and faculty's Council sittings. It is soon planned to create an electronic version of elaborated alumni survey.

Programme director and Vice-dean organise regular meetings with course and group senior members to discuss topical issues, problems, find solutions, hear out proposals and recommendations.

Students' evaluation of academic staff members in the reporting period has varied between 3.93 and 4.42, with 4.22 being the average score (in 5-point system). The academic staff members get acquainted with the evaluation of each particular course by evaluating the development potential of the course. Evaluation results are discussed also together with programme director when looking for the optimum solution.

According to the electronic survey created by LLU IS, the average score of studies by years vary between 3.62 and 4.02 (in 5-point system) which is perceived as averagely good to good and complies with the results of faculty's alumni survey results. When collecting the results, one can conclude that alumni evaluate their preparedness for work in the industry as averagely good to good. The alumni marked that their ability to independently perform work tasks according to the job role, to work in a team, solve practical issues professionally is good; ability to solve strategic issues, lead work collective, consult customers, work with foreign cooperation partners is average. The alumni positively evaluate a cooperation with thesis supervisor and improved information processing skills. They mention foreign language skills as a shortcoming even though these skills

have improved over recent years. Communication and presentation skills of alumni have improved during the reporting period.

Recommendations provided by the alumni can be taken into consideration when improving some courses, when changing their volume and creating new courses, thus giving an improvement to the programme in general.

Alumni survey results show that agriculture industry contains a plenty of knowledge and practical skills and after graduation from the programme the professional development must go on to be updated in industry's topical issues, so a consequent self-education skill is very important.

Large number of alumni work in farms or rural production enterprises already during the studies, some of them remain working at professional traineeship providing company / farm / public authority. Employers point out that students have sound theoretical knowledge, they can integrate well in a team. Supervisors of traineeship companies (potential employers) evaluate students from good to excellent, praising their theoretical knowledge and organisational skills, and teamwork. The feedback on students' work in traineeships praise their purposefulness, developed communication skills, clear vision and understanding of the chosen industry, time for information sourcing to explain economic problems and solving organisational issues of work. Heads of the traineeship providers mark that apprentices are aware of their field however point out that there is always some room for development. Nevertheless, traineeship supervisors indicate also that apprentices have a different level of preparedness in theoretical issues.

According to the research data obtained by SIA Dynamic University, the employer survey included representatives of companies operating in field crops, animal husbandry, game management and related auxiliary works (n=40), where 52.5% of respondents say that qualified specialists are demanded today as much as 5-10 years later. Employers specified the most important skills and knowledge: industry-compliant education and knowledge (73%), integrity and responsibility (20%), knowledge of the market (10%), technical and digital skills, financial literacy and communication skills, and team leading and cooperation skills.

Based on the survey results, volumes of courses have been changed in the reporting period (for example, number of lessons in the courses related to identification of plant disease triggers, insects and damage caused by them, development cycles, restriction possibilities, economically useful invertebrates); new courses were created which expand students' understanding of sustainable agricultural production (for example, The Basics of Biochemistry, Soil and Water Conservation) and expand professional preparedness (for example, Fish Husbandry). We have agreed with National Plant Protection Service that students could acquire a certificate of user of plant protection agents (registration class 2), if they successfully pass the courses in Plant Pathology, Entomology and Crop Protection. The acquired certificate allows the students to work in a traineeship and to be more competitive in the labour market.

Regular talks with all stakeholders (students, employers, industry's organisations) lay a basis for development of course content and programme.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

In the reporting period, 59 students were involved in exchange programme ERASMUS+, choosing to

study (36 students) and undergo professional traineeship (23 students). They choose universities from 7 countries (Czech Republic, Slovakia, Lithuania, Norway, Portugal, Spain, Poland) for studies; they went for a traineeship in foreign companies and institutes in 10 countries (Germany, Spain, Portugal, Belgium, Croatia, Netherlands, Austria, Denmark, Estonia, France).

In the reporting period, 8 students went to study and nobody chose to go for a traineeship abroad in the exchange programme ERASMUS+ in academic year of 2013/2014. The largest number of students to take use of student mobility opportunities both for studies and traineeship was in academic year of 2017/2018 (10 and 7 students respectively), mobility opportunities were used only by several students over some last years of the reporting period (Annex 12 in part Study field). Some students have used other possibilities to undergo traineeship in foreign companies and have done so in Canada, South Africa and Russia. Studies and traineeship abroad in academic year of 2019/2020 were restricted by the spread of COVID 19.

Taking into account relatively low mobility activity, student survey was conducted in the reporting period. Judging from the survey results, relatively low student activity is explained by work in their own farm or that of their parents (mainly for male students); not being sure about their foreign language skills; lack of wish to stay away from home for a longer period (mainly for female students); not being sure if they are able to handle studies after returning; part of students surveyed believed that existing programme provides all that is needed for a competitive education. Students who chose a qualification Agronomist with a specialisation in horticulture used mobility opportunities of ERASMUS+ most frequently.

ERASMUS+ student mobility is available to all study directions in LLU and all higher education levels and they take place according to *Erasmus University Charter* and ERASMUS+ Student Charter. For more detailed information refer to LLU website: <https://www.llu.lv/en/erasmus>.

Before heading to any university involved in ERASMUS+ exchange programme, students coordinate study courses in the chosen university and alignment possibilities of the courses in their programme either fully or partially (applicants prepare Academic Recognition Intention Letter which is harmonised with programme's director and is considered to be dean's approval). Students choose universities and courses to be acquired very responsibly. ERASMUS+ coordinator from the faculty and programme director engage in a course selection, by evaluating the courses offered by the partnering university according to the study direction and encouraging students.

Once they return from studies in a partnering university, the courses mastered there are fully or partially aligned (by harmonising in advance if the course volume matches). During the reporting period, in one case one course only could not be aligned because it was not successfully acquired.

Before going for a traineeship to a foreign company, a student with traineeship supervisor harmonises the traineeship programme and defines traineeship tasks in the traineeship agreement. The agreement is signed by a student, programme director and contact person from the traineeship provider. Once the traineeship is completed, student submits the traineeship report and a certificate and feedback from the traineeship provider, participates in public defense of their traineeship according to traineeship programme and LLU Traineeship Regulation.

ERASMUS+ scholarship for traineeship mobility is available also to LLU alumni. In the reporting period, this opportunity is taken by one student when heading for a traineeship in Norway.

In the reporting period, more than 60 foreign students from Poland, Slovakia, Portugal, Turkey, Kazakhstan, Lithuania, Italy, Romania, France, Netherlands, Germany, Russia, Ukraine, have studied in the Faculty of Agriculture. 7 students from Slovakia (graduate student, traineeship provided by SIA "LLU MPS "Vecauce""), Turkey and Romania came for a traineeship. Lectures were delivered and experience was exchanged by academic staff members from Kazakhstan, Turkey, Romania,

Belgium, Sweden, Russia, Albania, Portugal, Poland and Uzbekistan.

Outgoing and incoming student mobility is summarized in Annex 12 of the study field report section.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

All faculties with the classrooms, premises for practical and laboratory works and laboratories at disposal of the faculty are involved in delivery of Professional Bachelor's study programme.

General-use premises (equipped classrooms for lectures and seminars) and laboratories of faculties involved in studies are used for study processes taking place in the Faculty of Agriculture.

LLU LF study and scientific laboratories:

- Grain and Seed Science – scientific laboratory, 2 Street Lielā, Jelgava. Equipped with laboratory equipment and inventory (grain quality analyzer Infratec, which is included in the Latvian Grain Network, climate chamber for determining seed germination potential, seed counter, device to determine gluten content, falling number, scales and other devices).
- Soil and agrochemistry science laboratory, 2 Street Lielā, Jelgava. The laboratory is equipped with devices and inventory for examining soil properties, analysis of plant parts and fertilisers, soil respiration intensity and determining of other parameters and indicators; rock and mineral and plant profile collections are used in the study process (190 soil profiles).
- Soil and agrophysics laboratory, 2 Street Lielā, Jelgava. Equipped with the necessary equipment to determine agrophysical properties of the soil and analyse treatment systems (determining capillary porosity of soil and absolute humidity content and other agrophysical properties), area calculation and global positioning system (GPS), soil layer density measuring device and other devices.
- Plant pathology and entomology laboratory, 1 Street Strazdu, Jelgava. Equipped with devices and inventory (climate chambers, microscopes which are connected to computer, laminar boxes etc.) which allow acquiring pure pathogenic fungi cultures from damaged plants for diagnostic purposes; allows identifying insects etc.
- Microbiology laboratory, 1 Street Strazdu, Jelgava. Fitted with equipment and inventory for examining the biological processes of the soil, running microbiological soil analyses, examining impact of various preparations on microorganism growth, testing antibacterial properties of preparations, collection of *Rhizobium* spp. strain (44) for growing commercially important papilionaceous plants etc.
- Plant biology and physiology laboratory, 1 Street Strazdu, Jelgava. Fitted with equipment and inventory for examining the physiological processes of plants, determining and analysing of

biochemical composition of plants, plant propagation *in vitro*. There is a greenhouse for growing plants, equipped with measuring instruments and devices for keeping and controlling the microclimate (records, observation).

- Horticulture plant and apiculture (beekeeping) laboratory, 1 Street Strazdu, Jelgava. The laboratory has horticulture and apiculture equipment, devices and inventory. There are two greenhouses made of different materials and equipped with devices for plant proliferation and growing in different systems. There are vegetable, medicinal plant and herb collections arranged and maintained for keeping the genetic resources, a collection of different species and varieties of high bush blueberries, and a collection of other horticulture species and varieties. Genetic resources of Latvian honeybee are being maintained and instrumental insemination is taking place. An object for presenting the systems for growing golden currants and high bush blueberries has been arranged.

In order to deliver animal husbandry direction in the study process, faculty's laboratory equipment is used, for example, for analysis of nutrition; specialised software for calculation of feed portions is mastered and laboratories of other faculties involved in the study process are used.

As already mentioned, all faculties are involved in delivery of study programme, therefore laboratories of these faculties and equipment for practical and laboratory work and elaboration of the thesis are used.

LF study and research farm (MPS) "Pēterlauki" (comparison of field crop varieties, soil treatment methods, growing technologies etc.) and SIA "LLU MPS "Vecauce" (in animal husbandry (livestock, breeding methods, milking technologies, types of cattle-sheds etc.) in field crop culture and horticulture) materially technical base is used for study traineeships. Horse breeding course uses the material base of MPS "Pēterlauki" equestrian and training centre "Mušķi".

All laboratories perform practical, laboratory works, as well as experiments and analyses for elaboration of the thesis. Materially technical base of study and research farm is used for elaboration of theses.

In order to elaborate study papers (independent, papers, seminar paper, course paper, final paper) one can use the services, resources and databases of LLU Fundamental Library (see Section 2.3 of Part 2), as well as resources from the faculty's institutes and academic staff members - scientific journals, volumes of conference papers, monographs, books and other informative materials.

Materially technical base is being constantly improved, in the confines of available budget. For example, within the framework of project No. 8.1.1.0/17/I/001 premises, classrooms, computer classes and laboratories necessary for delivery of STEM programme were equipped and modernised (e.g, microscopes for plant pathology laboratory works, equipment of entomology training, mobile device for determining microclimate, device for sampling the feed etc.), laboratory equipment was bought (for example, draught cabinets, soil water return gauge etc.), greenhouse equipment (e.g., flooding tables) etc., laboratory devices and equipment were bought in academic year of 2014/2015 within the framework of Agriculture Ministry subsidy contract No. 180914/267 (e.g., reagents and laboratory materials, digital scales with software, mobile device for non-destructive determining biochemical composition of plants).

Every year part of faculty's funding is used for renewing or improving materially technical base.

Devices and equipment which were covered from scientific projects' funds are used for elaboration of theses, because some part of Bachelor theses is elaborated by students within the framework of scientific projects.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

Academic staff members from all faculties (91 academic staff members) are engaged in delivery of programme thus ensuring attainment of proposed learning outcomes at good quality. Academic staff member ratio: 17% professors, professors Emeritus and visiting professors, 16% associated professors and assoc. professors Emeritus, 28% university lecturers and visiting university lecturers, 37% lecturers and visiting lecturers and 2% visiting assistants. 60% of staff engaged in delivery of the study programme is elected academic staff members (of them 53% hold a Doctor of Sciences degree) and 40% of academic staff is not elected.

40 academic staff members (8 professors, 4 professors Emeritus, 5 associated professors, 8 university lecturers and visiting university lecturers, 10 lecturers and visiting lecturers, 5 assistants and visiting lecturers-assistants) from the Faculty of Agriculture delivered the studies in the beginning of reporting period, and 47 academic staff members (6 professors and 2 professors Emeritus, 4 associated professors and 2 associated professors Emeritus, 14 university lecturers and visiting university lecturers, 14 lecturers and visiting lecturers, 2 assistants and visiting assistants) delivered studies at the end of the reporting period. 45% of LF university lecturers who participate in study delivery hold Doctor of Science degree, and they provide to emerging students professional and scientific research based on insights on the industry's topicalities.

Qualification and skills of university lecturers involved correspond to the regulatory documents and are evaluated in a long-term, therefore changes in composition of university lecturers are not significant.

Number of professors has decreased at the end of the reporting period whereas the number of university lecturers and visiting lecturers has increased. Increase in number of university lecturers in the reporting period indicates at qualification development of university lecturers. Changes in the number of academic staff members are gradual as the qualification of academic staff develops, it entails better quality of studies. The best graduate students are also involved in delivery of Professional Bachelor's study programme as they are heading practical and laboratory works. The leading researchers and researchers both from the Faculty of Agriculture and from the cooperation institutes are involved in delivery of studies as supervisors of theses.

Representatives from agriculture and other industries are invited each year to deliver lectures in courses on certain topics. Number of visiting lecturers from industry by years in the reporting period was between 12 and 33. This traineeship provides a close connection between theory and practice, shows students the role of theoretical knowledge in professional work, coherence with

other industries and impact on agricultural production.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

The academic and scientific staff involved in delivery of study programme meets the criteria stated in the Law On Higher Education Institutions and Law On Scientific Activity.

As mentioned in Section 4.1, 45% of LF university lecturers involved in delivery of Professional Bachelor's study programme hold a Doctor of Science degree, besides not only in agriculture but also in biology and geology (53% of academic staff members involved in delivery of programme hold Doctor of Science degree). 72% of university lecturers in the faculty are elected in academic positions according to laws and regulations (university lecturers, leading researchers and researchers). Qualifications of visiting university lecturers involved in delivery of the programme meet the criteria laid down in the industry.

Active research work of the academic staff members (both in national and international projects) ensures the quality of relevant course because conclusions learnt from projects are integrated in the courses. Part of students are involved in projects by developing skills necessary for the research and understanding the role of obtained results in professional activity. Some part of academic staff members engages in education-related international projects and then sharing this foreign countries' experience and insights with colleagues and integrating them in their lectures.

The academic staff members constantly develop their teacher qualification by using possibilities offered by the programme "Innovations in University Didactics" and professional qualification by attending various courses and seminars in relation to professional direction. Since the number of students with English as instruction language increases in LLU, the university lecturers improve their English in different ways. LLU started implementing ESF project 8.2.2 "Professional development of academic staff of LLU" in 2019, within the framework of which the academic staff improves foreign language skills and take an opportunity to intern in various companies of the industry. Three academic staff members from LF, within the framework of this project, have finished internship in two companies; four academic staff members improved their English skills (Pearson certificate obtained); seven academic staff members started improving their English; 25 academic staff members improved their information literacy by attending a training "Modern and Efficient Communication and Cooperation Tools in IT platforms" (they chose to acquire all 3 topics or one of them). Some of academic staff members still continue training and internship in the project.

Many university lecturers are involved in the work of non-governmental organisations, action groups of different ministries, are members of international organisations, engage in national and international conference scientific committees and organisational committees. Intense organisational activity allows solving topical problems and issues of the industry not only at national but also international scale.

Results of university lecturers' academic, scientific and organisational activity is summarised on

annual basis in reports and they are related to motivation principles elaborated by LLU. University lecturers' achievements are included in their CV.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

Lecturers actively engage in managing or executing scientific and practical projects of various levels. The research work of academic staff members is mainly related to specialisation of university lecturers within the framework of programme and managed courses. Research performed by the academic staff is significant both for development of representing industry and improvement of study courses, because university lecturers integrate the most topical issues and solutions in their courses via the agency of research.

Several dozens of projects of various levels are implemented in the Faculty of Agriculture each year, and also students from all programmes are engaged in some of them. In the reporting period the academic staff members engaged in international 7th framework programme Horizon 2020, ERA-NET projects, National research programme, research projects of the Ministry of Agriculture (field cultivation, horticulture and animal husbandry field), Cooperation (16.1 and 16.2) projects. The projects are implemented together with industry's organisations (for example, Latvian Sheep Growers Association, Latvian Rural Consultation and Education Centre, Latvian Fruit Production Association etc.), scientific institutes (Institute of Agresources and Economics, Horticulture Institute etc.), conducts contracted research together with entrepreneurs. Participation in implementation of education projects (ERASMUS+) together with foreign cooperation partners (such as ERASMUS intensive courses European Soil Science, which are delivered together with colleagues from Nicolaus Copernicus University in Toruń, Poland; Erasmus+ project Climate Changes in

Agriculture, implemented in cooperation with colleagues from the Agricultural University of Athens).

Involvement of academic staff members in interdisciplinary projects promotes understanding of interactions between various industries (agriculture, food, veterinary medicine, forest, information technologies, engineering science, environment and construction science), and results obtained from research/experiments are shown to students in particular courses.

Involvement of programme's university lecturers in projects (management or participation) is reflected in person's CV.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Courses are mutually related, students obtain theoretical basis in the chosen speciality through generally educative and industry's theoretical courses, entrepreneurship, cooperation, communication, and presentation skills are developed.

The procedure for elaboration of course programmes is determined by LLU Study Vice-rector's order "On procedure of elaboration of course/traineeship programme and procedure for registering and updating the information in LLU IS Course Register". Once the course is elaborated, it is examined in the sitting of academic staff of the structural unit, faculty's methodological commission and approved by the Council of the Faculty of Agriculture.

A course is elaborated by the university lecturer or a group of university lecturers of relevant field, according to skills defined in the profession standard, industry's topicalities not only at national but also international scale and taking into account the labour market trends. Heads and director of programme's sub-direction engage in a discussion on course content. Sittings of course's university lecturers are organised to discuss the topicalities of each course or direction, teaching methods and to share experience. The cooperation takes place within the framework of all the faculties and structural units involved, and discussions lead to the desirable outcome.

Mapping of the programme (Annex 7) allowed an in-depth analysis and facilitated editing some of the content, including providing more specific information on expected learning outcomes, requirements for successful acquisition of course.

91 university lecturers are involved in the study programme, equalling to 15.83 workloads. Student-academic staff ratio is 16.7: 1.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	4_pielik_Statistikas-dati_Statistical-data_Lauks_BAK_lv_en.pdf	4_pielik_Statistikas-dati_Statistical-data_Lauks_BAK_lv_en.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	1_annex_Compliance_to_State-Educ-Standard_Ls-bak_preciz.pdf	1_pielik_Atbalstiba-valsts-izglitiba-standartam_Ls-bak_LV_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)	2_annex_Compliance-with-profess-stand_Ls_bak_EN_prec.pdf	2_pielik_Atbalstiba-profesijas-standartam_Ls_bak_LV_prec.pdf
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	7_pielik_prof_bak_Agricult_Mapping.xlsx	7_pielik_prof_bak_Lauks_studiju_kursu_kartejums.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	3_pielik_Studiju-plans_Study plan_lv_en.rar	3_pielik_Studiju-plans_Study plan_lv_en.rar
Descriptions of the study courses/ modules	5-annex_Study courses-EN.rar	5_pielik_Studiju-kursi-LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikumi_bak_full-time-part-time_en.rar	Diploms-un-pielikumi_bak_PL_NL_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	6Agreement between_LU_LLU.pdf	6Vienosanas_ar_LU_LLU.pdf
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education		
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.		

Forest Science (43623)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Forest Science</i>
Education classification code	<i>43623</i>
Type of the study programme	<i>Academic bachelor study programme</i>
Name of the study programme director	<i>Baiba</i>
Surname of the study programme director	<i>Jansone</i>
E-mail of the study programme director	<i>baiba.jansone@llu.lv</i>
Title of the study programme director	<i>Ph. D.</i>
Phone of the study programme director	
Goal of the study programme	<i>To provide students with basic professional knowledge in forestry, including theoretical and methodological bases of forestry and related sciences, skills to solve current theoretical and practical problems of forestry independently, to ensure the application of this knowledge in practice and research and preparation of students for further studies.</i>
Tasks of the study programme	<p><i>Tasks of the programme:</i></p> <ul style="list-style-type: none"> <i>o to prepare specialists for sustainable, scientific and practically rational management of forest resources, constant renewal and conservation of biological diversity of forest;</i> <i>o to provide theoretical and technological knowledge on processes taking place in the forest and practical skills in application of knowledge, their analysis and evaluation, to analyse information and use it for identifying regularities, to adopt decisions and solve problems in forest industry so that the alumni are competitive in the labour market;</i> <i>o to prepare specialists who evaluate national and private forest resources, prepare their management projects, control implementation, update data on the Forest Fund of the Republic of Latvia, analyse this data and elaborate the basic principles and legislative documents of forest policy;</i> <i>o to ensure management, control and supervision of state forests carried out by the specialists with the best qualification from the forest office, forestry and other institutions;</i> <i>o to prepare qualified consultants for private forest owners, who can engage in good quality management of these forests in future;</i> <i>o to prepare specialists for scientific work in forest science and intersection points of related sciences;</i> <i>o to provide forest education of all levels from higher qualified teaching specialists and higher forest education from professors;</i> <i>o to provide Latvian state with specialists who can cooperate with foreign partners in the forestry and engage in sociopolitical activities</i>

Results of the study programme	<p><i>Knows the most important theories and knowledge of forest science, their connection with other branches of science and economics, forestry practice, as well as the terminology of the branch in Latvian and foreign languages</i></p> <p><i>Able to independently select, summarize and analyse scientific information, know the methods of data acquisition for the needs of forest science and forestry practice, as well as methods of processing and analysis of the obtained data</i></p> <p><i>Is capable to communicate about aspects of forest science and forestry practice with members of the forest sector heaving different specializations as well as the general public. Able to independently improve qualification, implement research or development tasks in forest sector organizations</i></p> <p><i>Knows the current technical and technological solutions in forest science and forestry</i></p> <p><i>Is competent to independently prepare and substantiate solutions for forestry practice, synthesizing information from various sources, as well as to perform a critical analysis of existing solutions used in forestry and forest research</i></p> <p><i>Is competent to independently generate development ideas for forest sector organizations, enterprises, as well as plan, structure, and implement projects</i></p>
Final examination upon the completion of the study programme	<i>Bachelor Thesis</i>

Study programme forms

Full time studies - 4 years - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>4</i>
Duration in month	<i>0</i>
Language	<i>latvian</i>
Amount (CP)	<i>160</i>
Admission requirements (in English)	<i>General secondary education or vocational secondary education</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Bachelor Degree of Agricultural Sciences in Forest Sciences</i>
Qualification to be obtained (in english)	<i>—</i>

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IELA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Parameters of the study programme have not changed since the last accreditation.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Number of students in the academic Bachelor's study programme Forest Science varies from 90 to 141 between 2013 and 2020. The largest number of students in the programme was in the academic year of 2012/2013 (141), followed by slight decrease; the number of students increased again after 2017, reaching 108 in academic year of 2020/2021. (Annex 1)

Number of students already studying in the programme and freshly admitted is considered stable, with a slight inclining trend over recent years. Number of students admitted to the programme Forest Science has been slightly above the number of budget places every year, retaining this ratio also after increasing the number of budget places (academic year of 2018/2019), which shows permanent interest of youth in forest sciences. When evaluating the gender distribution of students admitted, there are no significant differences in the assessment period. In terms of percentage, differences vary from around one third of women from all the students admitted to approximately one half of students admitted (academic year of 2017/2018). Higher assessment ratio fluctuations are explained by increase of total number of students. (Annex 1)

Dynamics of the number of students is affected by many factors in further study years. The first-year students tend to dropout most, mentioning "at own discretion" as the main reason. (Annex 2) Such choice is often made because of not having considered well the chosen study programme. The first-year students often discontinue studies due to failure to comply with the study obligations. This reason remains topical also in later study years. Other reasons for discontinuing the studies:

- did not return from the academic leave of absence;
- failure to comply with study agreement obligations regarding financial liabilities;
- failure to fulfil contractual obligations regarding the study requirements;
- failure to fulfil contractual obligations by not signing an additional agreement to the study agreement on change of financing;
- failure to fulfil the decree of Vice-rector by not registering for the next study year;
- failure to start studies;
- failure to fulfil contractual obligations by not passing the final examinations of the studies.

There were no dramatic changes in number of students over last years, which shows the epidemiological situation has small immediate effect on the Bachelor students, however the impact is indirect. Often students find permanent full-time or part-time job, which takes away time from studies therefore students struggle to comply with the study agreement requirements.

There are study and student loans available to relieve some financial burden from students: "Regulation on study and student loans in Latvia from the credit institution funds, which are guaranteed from the State budget" (Cabinet of Ministers Regulation No. 231). Rotation system after each semester motivates students to improve their study progress and get a budget place. If a student studies for a fee, he or she must pay for studies according to the requirements laid down by LLU Senate. Fee amount is linked to socioeconomic situation in the state. Therefore, it is reviewed and adjusted on a regular basis to comply with all applicable legislative documents.

Academic Bachelor's study programme Forest Science is delivered only in Latvian.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

The **goal** of the academic Bachelor's study programme Forest Science is to ensure acquisition of fundamental and theoretical knowledge of the industry and prepare for graduate studies. To this end, study process is organised to acquire Bachelor Degree of Agricultural Sciences in Forest Science within the framework of academic studies.

Tasks of the programme:

- to prepare specialists for sustainable, scientific and practically rational management of forest resources, constant renewal and conservation of biological diversity of forest;
- to provide theoretical and technological knowledge on processes taking place in the forest and practical skills in application of knowledge, their analysis and evaluation, to analyse information and use it for identifying regularities, to adopt decisions and solve problems in forest industry so that the alumni are competitive in the labour market;
- to prepare specialists who evaluate national and private forest resources, prepare their management projects, control implementation, update data on the Forest Fund of the Republic of Latvia, analyse this data and elaborate the basic principles and legislative documents of forest policy;
- to ensure management, control and supervision of state forests carried out by the specialists with the best qualification from the forest office, forestry and other institutions;
- to prepare qualified consultants for private forest owners, who can engage in good quality management of these forests in future;
- to prepare specialists for scientific work in forest science and intersection points of related sciences;
- to provide forest education of all levels from higher qualified teaching specialists and higher forest education from professors;
- to provide Latvian state with specialists who can cooperate with foreign partners in the forestry and engage in sociopolitical activities.

The expected learning **outcomes** are outlined in the description of Latvian education system and

Cabinet of Ministers Regulation No. 240 "Regulation on the national academic education standard" (13.06.2014, entered in force on 16.05.2014) Requirements for study courses are defined in programmes and their annotations (LLU IS system), and a teacher introduces students to them before starting the course. Description of each course's programme specifies the knowledge, skills and competences to be acquired.

Having acquired the academic Bachelor's study programme Forest Science, the alumni possess a long-lasting body of theoretical and technological knowledge on sustainable scientific and practically rational management of forest resources, their renewal and conservation of biological diversity of forest, as well as practical skills for applying this knowledge to analysis, evaluation and identifying of regularities. Programme's alumni are prepared for further graduate studies, conducting the scientific work in forest science and intersection points of related sciences, and they can join the team of forest education as highly qualified teachers. Alumni can successfully solve forestry challenges and make sound decisions, and they have the knowledge to run business, do competent work in different forest sectors and other organisations both at national and international level.

The following admission requirements have been set for the full-fledged acquisition of the study program: General secondary education or vocational education. Compulsory: CE in Latvian, CE in a foreign language, CE in mathematics;

Program specific requirements: Must have CE (Centralized exam) or GA (diploma year mark) (for persons who received their education before 2004) in mathematics. Preliminary knowledge of mathematics is required, as it is necessary for successful completion of the program by acquiring such study courses as Dendrometry , Forest Regulation, Surveying, etc.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

In order to deliver study programme Forest Science in line with the latest scientific trends, industry and labour market demands, the course content is being constantly updated following the student feedback, recommendations from the employers, Council Convent of LLU Forest Faculty.

Industry specialists from the leading forest management companies, for example AS Latvian State Forests, supervising institutions, such as State Forest service, as well as LVMI "SILAVA" and other companies of the industry are invited to review course content.

Changes in the study content were made in compliance with *Regulation on national academic education standard* (Cabinet Regulation No. 240 of 13.05.2014), *Standard of forestry engineer*

profession, elaborated by the Forest Industry in cooperation with the Forest Faculty in December 2014, according to modern requirements for forest management provision as well as alumni surveys on the role of courses and usefulness in work.

Changes started to be implemented in the study plan in academic year of 2015/ 2016 for the 1st year students, and 2018/ 2019 was the year when students of the 4th year graduated from the new study plan, while in the academic year of 2017 / 2018, students of the 4th year completed implementation of previous study plan.

Regulation on national academic education standard states that the compulsory section of the Bachelor's study programme is not less than 50 credits (according to previous study plan - 55.5 credits; according to new one - 66 credits), restricted elective section - not less than 20 credits (according to previous study plan - 36.5 credits; according to new one - 47 credits). The content of the academic Bachelor's study programme Forest Science meets the standard requirements. As a result of changes made according to the *Standard of forestry engineer profession*, the number and also volume of courses both in compulsory and restricted elective sections was increased thus providing the necessary versatile areas of Forest industry and related knowledge, skills and competences. The course has been improved and updated in line with the changes and according to latest scientific insights and state of the art. Volume of the Bachelor thesis remains the same - 12 credits.

Changes in the study plan's section "Compulsory courses" are shown in Table 1. Changes in credit volume of some courses are related to integration of topics into professional courses as well as content optimisation and correction.

Table 1

Changes in the study plan's section "Compulsory courses"

Code LLU IS	Current course	Credits	New code LLU IS	Substituted or newly created course	Credits	Notes
Filz1003	Ethics, Aesthetics	1,5	Filz1026	Philosophy, Ethics, Aesthetics	2,0	Decrease by 1 credit
Filz1001	Philosophy	1,5				
ValoP059	Professional English I	1,5	ValoP291	Professional English I	2,0	Decrease by 1 credit
ValoP060	Professional English II	1,5				
ValoP061	Professional English III	1,5	ValoP292	Professional English II	2,0	Decrease by 1 credit
ValoP062	Professional English IV	1,5				
Mate4015	Mathematics II	3,0	Mate1032	Mathematics II	2,0	Decrease by 1 credit
Fizi2010	Physics I	2,0	Fizi2037	Physics and Meteorology	3,0	Decrease by 2.5 credit
Fizi2011	Physics II	2,0				
Fizi2026	Meteorology	1,5				

<i>Code LLU IS</i>	<i>Current course</i>	<i>Credits</i>	<i>New code LLU IS</i>	<i>Substituted or newly created course</i>	<i>Credits</i>	<i>Notes</i>
MašZ4015	Engineering Graphics	1,5	MašZ2014	Engineering Graphics	2,0	Increase by 0.5 credits
Psih1002	Applied Psychology	1,5	Psih1011	Organizational Psychology and Management	3	
Soci2001	Sociology	1,5				
MatZ2009	Wood Science	1,5	MatZ2008	Wood Science	2	Increase by 0.5 credits
MežZ3032	Research Methodology I	1	MežZ3064	Basics of Scientific Research	2	Combination of study courses
MežZ3002	Basics of Scientific Research	1				
MežZ3020	Dendrometry I	2,5	MežZ3081	Dendrometry I	3	Volume is retained, number of credits across the semesters was changed
MežZ3021	Dendrometry II	2,5	MežZ3082	Dendrometry II	2	
Ķīmi1008	Chemistry I	2,5	Ķīmi2017	Chemistry I	2	Decrease by 0.5 credits
DatZ2037	Informatics	3	InfT1026	Information Technology	2	Decrease by 1 credit
BūvZ1013	Surveying	3	BūvZ1038	Surveying	2	Decrease by 1 credit
Biol3011	Plant Physiology	2,5	Biol3017	Plant Physiology	2	Decrease by 0.5 credits
LauZ2021	Forest Soil Science	4	LauZ2057	Forest Soil Science	3	Decrease by 1 credit

Changes in the study plan's section "Restricted elective courses" are shown in Table 2. Changes in credit volume of some courses are related to integration of topics into other professional courses as well as content optimisation. New and very topical courses were created: Logistics in Forest Sector (2 credits), Risk Management in Forestry I (2 credits) and Wood Commodities Science (2 credits), course Forest Science Actualities which was created in cooperation with LVMI "Silava", Management of Urban Forests (2 credits).

Table 2

Changes in the study plan's section "Restricted elective courses"

<i>Code LLU IS</i>	<i>Current course</i>	<i>Credits</i>	<i>New course LLU IS</i>	<i>Substituted or newly created course</i>	<i>Credits</i>	<i>Notes</i>
MežZ1008	Introduction to Forestry	2	MežZ3068	Introduction to Forestry	3	Increase by 0.5 credits
Ekon1002	Theory of Economics	1,5	Ekon2136	Economics Theory and Accounting	3	Combination of study courses
Ekon2046	Accounting Basics	1,5				
JurZ2001	Basics of Law	1	MežZ4073	Forest Legislation	2	Decrease by 0.5 credits
MežZ4011	Forest Legislation	1,5				
MežZ2026	Landscaping	1,5	MežZ2040	Landscape Design	2	Increase by 0.5 credits
MežZ4003	Practical Silviculture	3	MežZ3069	Practical Silviculture I	2	Increase by 1 credit
			MežZ4075	Practical Silviculture II	2	
MežZ3006	Forestry Nurseries	2,5	MežZ3070	Forest Nurseries	2	Decrease by 0.5 credits
MežZ4047	Forest Exploitation I	3	MežZ4047	Forest Exploitation I	2	Volume is retained, number of credits across the semesters was changed
MežZ4014	Forest Exploitation II	2	MežZ4014	Forest Exploitation II	3	
MežZ4005	Forest Regeneration	2	MežZ3071	Forest Regeneration	3	Increase by 1 credit

MežZ4026	Forestry Economics	2	MežZ4023	Economics of Forest Resources	2	Study courses were changed
			MežZ4085	Logistics in Forest Sector	2	New course
			MežZ4083	Risk Assessment in Forestry	2	New course
			MatZ3018	Wood Commodities Science	2	New course

The volume of free elective courses in the new study plan is 8 credits (instead of former 9), they will be acquired mainly in autumn and spring semesters of the 3rd study year (6 credits) and also autumn semester of the 4th study year.

Changes in the study plan's section "Course Papers" are shown in Table 3. So far, the study plan included course papers and projects at the volume of 13.5 credits. Since the course papers are integral part of the courses, their volumes are mutually integrated and balanced. Course papers and projects of the new study plan total in 11.5 credits: course volumes were changed from 1.5 credits to 1 credit.

Table 3

Changes in the study plan's section "Course Papers"

<i>Code LLU IS</i>	<i>Current course</i>	<i>Credits</i>	<i>Code LLU IS</i>	<i>Substituted or newly created course</i>	<i>Credits</i>	<i>Notes</i>
MežZ3011	Practical Silviculture	1,5	MežZ4076	Practical Silviculture	1	Decrease by 0.5 credits
MežZ2027	Landscaping	1,5	MežZ2041	Landscape Design	1	Decrease by 0.5 credits
MežZ4006	Forest Regeneration	1,5	MežZ3072	Forest Regeneration	1	Decrease by 0.5 credits
MežZ4050	Entrepreneurship in Forest Management	1,5	MežZ4081	Entrepreneurship in Forest Management	1	Decrease by 0.5 credits

MežZ4048	Forest Exploitation	1,5	MežZ3080	Forest Exploitation	1	Decrease by 0.5 credits
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Changes in the study plan's section "Traineeships" are shown in Table 4. To acquire skills and competences according to the requirements, necessary for work in the Forest industry, volume of study section "Traineeships" was increased from 13.5 credits to 16 credits. Merging several small traineeships resulted in a complex traineeship "Forest Science" which includes Dendrology, Forest Soil Science, Game Management, Forest Tree Improvement and Forest Science. Volume of the traineeship "Organisation and Economics" (factory traineeship, 1 credit) which takes place in Forest industry companies was doubled (from 1 to 2 credits), and now it is titled "Organisation, Planning and Management" (2 credits).

Table 4

Changes in the study plan's section "Traineeships"

Code LLU IS	Current course	Credits	Code LLU IS	Substituted or newly created course	Credits	Notes
BiolP007	Forest Botany	1	BiolP011	Forest Botany	2	Increase by 1 credit
BiolP001	Dendrology	1	MežZP043	Forest Science	4	Increase by 0.5 credits
LauZP019	Forest Soil Science	0,5				
MežZP003	Game Management	0,5				
MežZP007	Forest Tree Improvement	0,5				
MežZP006	Forest Science	1				
MežZP021	Practical Training	1	MežZP038	Organization, Planning and Management	2	Increase by 1 credit

In academic year of 2019/ 2020, the following courses were swapped: *MežZ3034 Timber Transportation* is delivered in Semester 5, while course *MatZ3018 Wood Commodities Science* - in Semester 6.

In the academic year of 2020/2021 a new course *Citi2036 State Defense Basics for Individuals* (1 credit) was created.

Creation of new courses

Philosophy, Ethics, Aesthetics - 2 credits. Questions of philosophy, general principles of professional and general ethics are included in the course. The course was created by merging previous study courses Philosophy, Ethics and Aesthetics (overall volume of credits was decreased by 1 credit).

Organisational Psychology and Management - 3 credits. The content includes questions about sociology, psychology, communication technique and management sciences. The course was created by merging previous courses Applied Psychology, Sociology.

Information Technologies – 2 credits. Questions focusing on use of the information technologies in economics are included in the content. It substitutes previous course Informatics (overall volume was decreased by 1 credit)

Physics – 3 credits. It substitutes previous courses Physics I, Physics II (overall volume was decreased by 2.5 credits)

Basics of Scientific Research – 2 credits. The course was created by merging previous courses Methodology of Research and Basics of Scientific Research.

Economics and Accounting – 3 credits. The course was created by merging previous courses Theory of Economics, Accounting.

Forest Legislation – 2 credits. The course was created by merging previous study courses Basics of Law and Forest Legislation (overall volume of credits was decreased by 0.5 credits).

Practical Silviculture – 4 credits. Certification and forest management planning was included in the course. Volume of the course was increased by 1 credit.

Forest Regeneration – 3 credits. Mechanisation of forestry works was included in the course. Volume of the course was increased by 1 credit.

Logistics in Forest Sector – 2 credits – new course.

Risk management in Forestry – 2 credits – new course.

Forest Botany – 2 credits. Course (study traineeship) was created as addition of phytocoenology section to course Forest Botany. Volume of the course was increased by 1 credit.

Forest Science – 4 credits. Course (study traineeship) was created by merging previous courses Dendrology, Forest Soil Science, Game Management, Forest Tree Improvement and Forest Science. Volume of the course was increased by 0.5 credits.

Organisation, Planning and Management – 2 credits. Volume of the course (factory traineeship) taking place in the Forestry industry companies was increased by 1 credit.

The employers confirm that programme's alumni are demanded in the labour market, because they have good theoretical and practical background and ability to complete their assignments individually. Large part of the students and alumni work in industries associated with their profession.

The alumni work in the manufacturing sector (JSC Latvian State Forests, State Forest Service, private sector etc.), science (LVMI *Silava*) and education (LLU Forest Faculty, Ogre Vocational School etc.), and also continue studies in graduate programme.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

The study programme's plan (Annex 5) was construed in accordance with the principle of

succession and logic sequence of courses, taking into account the prerequisite knowledge needed for students to acquire each of the courses in question.

Courses to be mastered in the 1st study year mainly provide the basic knowledge and understanding of processes going on in forest. Forest botany, forest animal biology, basics of forestry are acquired. Students also acquire theoretical courses which develop personality and prepare for in-depth knowledge in professional field – students learn mathematics, professional foreign language, land surveying, biometrics, physics and also philosophy, psychology and information technologies. Forest botany and land surveying is acquired at deeper level during the study traineeship.

The 2nd year students continue attending courses which give professional insight into forest both from economic and ecological aspects. Learn forest protection, wood science, game management, protection of species and biotopes, plant physiology and dendrology, forest melioration, forest soil science and technical graphics. Students get acquainted with forest science and forest protection during their traineeship.

The 3rd year students learn about forest regeneration, dendrometry. They are introduced to the basic principles of forest nurseries, management of urban forests and landscape design, and also learn about risk management in forestry. Practical skills in forest taxation will be strengthened in the traineeship.

The 4th year students mainly learn courses related mostly to forest management – Forest Management, Forest Exploitation, Forest Management Business, Forest Logistics and Forest Legislation. Students in the traineeship are introduced to aspects of organisation, planning and management in the industry. This academic year, much attention was paid to elaboration of Bachelor thesis, and it is supported by learning the scientific research basics.

The course programmes were also created harmoniously with elaboration of course mapping (Annex 4), which shows success of achieving the learning outcomes of the programme in relation to the knowledge, skills and competences included in the course programmes.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Academic Bachelor's study programme "Forest Science" is delivered as full-time studies, corresponding to 40 credits in the academic year. One credit equals 16 academic hours. The academic hour is a unit of study work lasting for 45 minutes (Law on Higher Education Institution, <https://likumi.lv/ta/id/37967-augstskolu-likums>; Education Law <https://likumi.lv/ta/id/50759-izglitibas-likums>, only in Latvian).

The student acquires education content within the framework of education programme of LLU Forest Faculty, Silviculture Department, as full-time studies, regularly attending the classes organised in the educational institution according to a curriculum.

LLU implements 10-point knowledge evaluation system according to the criteria approved in LLU

Senate (10 – outstanding; 9 – excellent; 8 – very good; 7 – good; 6 – almost good; 5 – satisfactory; 4 – almost satisfactory; 3 – poor; 2 – very poor; 1 – very, very poor). “4” is the lowest passing grade in individual courses.

Typical forms of tests are written, oral, cumulative etc. We believe that evaluation criteria, forms and procedure of testing correspond to those accepted by foreign universities.

The course lecturer organises and heads contact lessons – lectures, laboratory work, practical works, seminars and independent works. He or she organises and supervises individual studies. Volume and requirements of the study course and their execution are defined in programme of each course; students are introduced to them upon starting each course. Contact lessons of the courses constitute 40%, while number of independent lessons – 60% out of all planned classes. Number (%) of practical classes increases in the courses related to actual production and possible responsibilities in future jobs. Several theoretical courses include practical and independent works where one must solve forest and other related, interdisciplinary problems, including tasks and situations of different complexity level. It helps the students to delve deeper in the problem either individually or in a group, to describe it by integrating the knowledge, skills and competences acquired in the course, as well as for the teachers to evaluate individual or group work – ability to become aware of the problem both qualitatively and quantitatively, propose the most suitable solution and potential developments in future.

Since the restrictions related to COVID-19 are in force in the country and according to epidemiology situation the study process is partly or fully organised as distant studies. In this case, basic platforms such as e-studies with integrated tool BBB (Big Blue Button) are used and they are available both for students and academic staff. In addition to that, the university lecturer is entitled to choose also other online communication tools. Tests and assignments are placed, submitted and evaluated in e-studies, and also materials necessary for acquisition of course are placed there.

At the end of each semester students are invited to fill out an anonymous survey on course in general, methods applied by university lecturer etc. These results are available for the relevant course teachers, programme director as well as head of department etc. This information allows responding to possible dissatisfaction of students and consider improvement options that would lead to betterment of studies through various ways:

- survey about methodological provision, teaching methods and necessary improvements is taken at the end of course;
- in cooperation with the programme director who helps solving actual problems between university lecturers and students;
- students’ agreement reached in the beginning of semester on the requirements put forth by teachers in order to successfully finish the course;
- participation in LLU sociology group survey about the course created and delivered by teachers;
- student participation in the work of Faculty Council and LLU Senate.

Internal quality assurance system includes:

- LLU working strategy;
- Strategy of the Forest Faculty;
- self-assessment reports of the study programme.

The theses are submitted according to the Study Vice-rector Resolution of LLU On the procedure according to which the digital copies of the master thesis must be submitted and verified for plagiarism in the control system (04.10.2017, No.2.4.-5./53.).

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

Academic Bachelor's study programme Forest Science includes several study traineeships in different study years.

Table 5

Traineeships included in the study plan

<i>Code LLU IS</i>	<i>Course</i>	<i>Credits</i>
BiolP011	Forest Botany	2
BūvZP006	Land Surveying	2
MežZP043	Forest Science	4
MežZP001	Practical Silviculture	1
MežZP019	Forest Exploitation	1
MežZP015	Dendrometry	2
MežZP038	Organisation, Planning and Management	2
LauZP004	Forest Protection	1
MežZP008	Forest Regeneration	1

Study traineeships are included in the programme starting from the 1st study year. The study traineeships are mainly organised as field trips and they can be perceived as complementary to relevant course to demonstrate students how theoretical knowledge from the courses is applied in real life both in companies of the industry and public administration structures, and they can also look at the scientific research objects. This study organisation model allows linking theoretical knowledge to practice, strengthening those acquired in the course, building skills and developing competences. Each traineeship programme, tasks and their assessment are outlined in the course description. It is available in LAIS system, and traineeship supervisor also presents these conditions before the traineeship.

Traineeships are organised during entire studies. The 1st study years offer traineeships Forest Botany, Land Surveying. The 2nd study year – Forest Science, Forest Protection, the 3rd year students improve their knowledge in traineeships Practical Silviculture, Dendrometry. The 4th study year offers Forest Exploitation, Organisation, Planning and Management and Forest Regeneration.

The traineeships are organised in close cooperation with industry specialists from the private and public administration by involving also scientists from LVMI Silava as much as possible. Traineeship supervisors are responsible for the content of their traineeship. If several academic staff members

(Forest Science) are involved in traineeship delivery, each of them individually organises tasks under their supervision and related tests, whereas the traineeship supervisor is a university lecturer who coordinates work of all academic staff members involved and makes sure the traineeship contents match the study programme.

Coherence with study programme can be viewed in Annex 4.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

Students of academic Bachelor's study programme Forest Science elaborate their Bachelor thesis within the framework of final works of the studies. In order to optimise elaboration of the thesis, the schedule for Bachelor theses is updated and approved in the Council sitting. This schedule for Bachelor thesis involves timely harmonisation of thesis' sections with the programme director, followed by approval in the sitting of Silviculture Department. In order to improve the result of elaborated Bachelor thesis, two pre-defenses are organised at various stages of readiness. Theses are pre-defended in front of academic staff members and supervisors of the theses, and entire process serves to eliminate shortcomings and improve paper quality.

After a successful pre-defense in MEZK Department the focus is put on defense in front of the National Examination Commission (NEC).

NEC consists of industry representatives - university lecturers from the Forest Faculty, representatives from AS LVM, LVMI Silava, Ministry of Agriculture, State Land Service. Also, this ensures a link to requirements of industry and employers' demands, match between student education and industry's actualities. The assessment of the Bachelor thesis is calculated from the average assessment of seven commission members. The National Examination Commission hears presentation of and reads the Bachelor thesis, provides their evaluation, comments on relevance in the industry, topicality and general quality of elaboration. These commentaries are taken into account in future organisation of studies, improvement of course content and choosing the reviewers for thesis.

During the reporting period, the average evaluation of final thesis is 7.5, with relatively small fluctuations over the years (ranging from 7.1 to 7.9). However, the excellent evaluation (rating 10) of work during this period has been few - 2 pieces or 1%. The worst case rating (5) is just as rarely used. The works are most often evaluated with a mark of 7 (39, 8%) and a mark of 8 (37.2%). Grade 9 has been given to 27 students or 13.8% of the defended thesis (see Table).

Evaluation of bachelor's thesis

Assesment	2013.	2014.	2015.	2016.	2017.	2018.	2019.	2020.	2021.
4 (almost average)	0	0	0	0	0	0	0	0	0
5 (average)	1	0	0	0	0	0	0	1	0
6 (almost good)	1	3	2	2	4	1	0	1	0
7 (good)	15	13	15	10	3	4	5	9	4

8 (very good)	16	7	11	6	8	5	7	3	10
9 (excellent)	5	3	3	4	0	9	0	1	2
10 (outstanding)	0	0	1	0	0	1	0	0	0
Total	38	26	32	22	15	20	12	15	16
Vidējā atzīme/ Average score	7,61	7,38	7,6	7,5	7,3	7,3	7,6	7,1	7,9

NEC evaluates: Quality of the Bachelor thesis has improved. Scientific and versatile Bachelor theses. Good Bachelor thesis presentation and defense skills. Choice of the scientific literature (incl. in foreign language) for thesis has improved. Confident discussion on research of the Bachelor theses.

Recommendations from the National Examination Commission (in choice of topics, elaboration, defense of theses, organisation of Commission's work etc.): to improve understanding and use of forest terminology; to define more considerate tasks of Bachelor thesis research and also their titles; to substantiate results with biometric methods and to know them when presenting interpretation of the results; to draw explicit conclusions about the results obtained; to take into account recommendations provided in pre-defense; to pay more attention to Latvian orthography and design. The Methodological Commission of the Forest Faculty should review topics of the Bachelor theses and requirements for their design in cooperation with NEC members, and to choose reviewers centrally; it is also necessary to improve the form of review by stating assessment gradient and to find a possibility to allow NEC reading the Bachelor theses in e-studies.

These recommendations are largely included in the process of elaboration of the Bachelor thesis.

NEC marked that the best theses of 2019/2020 were:

- Diversity of dead wood in various deciduous tree forests in Zemgale;
- Evaluation of the health condition and tree diseases of common spruce *Picea abies* (L.) in private farm "Egles";
- Suitability of broad-leaved forest biotopes for woodpeckers and evaluation of their ecosystems services.

In academic year 2018/2019, the NEC commended following theses:

- Growth of birch forest stands in initial density forest stands;
- Dendrometric indicators and quality of *Betula pendula* Roth in experimental plantation on agricultural land;
- Planning of inventory and management of Sēja Manor park values.

The statement of values indicates the students' ability to organize their time, convincingly and argumentatively defend their opinions, correctly use professional terminology.

Based on the recommendations and proposals of the members of the State Examinations Commission, the following changes have been made during the reporting period:

- It is possible for the members of the Commission to get acquainted with the Bachelor's thesis submitted for defense, using the LLU Moodle;
- The reviewer is appointed centrally, the reviewer is selected in connection with the topic of the work, often selecting a reviewer from cooperation organizations, for example, Latvian State Forest Research Institute "Silava", JSC Latvian State Forests, State Forest Service.
- In response to the commission's reprimands for careless design of the work, additional pre-

defense and evaluation of the content and design of the work has been introduced before it is recommended to be forwarded for defense to the State Examinations Commission.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

LLU has introduced the Student Survey System conducting regular student surveys each semester on the quality of studies and academic teaching staff in 5-point system. Survey results are available for each university lecturer of a particular course, director of study programme, dean, employee in charge from the LLU Study Centre, study Vice-rector.

Students were asked to rate the quality of academic teaching staff according to the following criteria:

- (1) the academic staff member introduced the student to course's goal, expected results and evaluation in the beginning of the course;
- (2) the academic staff member explained the course content understandably;
- (3) teaching methods/tuition methods facilitating the acquisition of course were used in the course delivery;
- (4) the academic staff member sparks interest/excitement in students to promote their participation;
- (5) the academic staff member provided feedback (explanation, analysis) about the results of learning/tests;
- (6) the academic staff member was available for consultations.

If 2-5 academic staff members deliver lectures, practical or laboratory works and seminars, the quality of their work is evaluated separately.

Digital survey questionnaires are anonymous and are not related to particular student; the obtained results are important for the improvement of study quality therefore we ask each student to find time for filling out the questionnaires. Unfortunately, not all students actively fill out the surveys. However, referring to the student survey and interviews, it is possible to substitute the academic staff member or ask him or her to change / improve the course content or teaching methods.

Every year LLU IS conducts a student survey about the programme through 18 questions, for example, about study plan, courses and their sequence, work of the study programme director, administrative staff and supporting staff in teaching, cooperation with the supervisor of thesis, skills and competences obtained during the studies, internet availability in LLU and information availability at LLU IS. The results obtained are analysed and evaluated thoroughly, relevant decisions are made to improve the study quality.

In the electronic survey system developed by LLU IS, the average evaluation of the program varies from 3.33 to 4.08 (5-point system), on average 3.71, which can be assessed as moderately good to good. Graduates of the study program evaluate their readiness for work in the field as average good to good. Graduates highly value cooperation with the supervisor of the final thesis, material and technical support, increasing presentation skills. Relatively lower ratings are for the ability to use information or improve organizational skills. The self-assessment of foreign language skills has also increased during the reporting period. However, it should be noted that the surveys are completed voluntarily, and the number of respondents is small.

The recommendations of the graduates have been considered for the improvement of individual study courses, changes in the volume, thus improving the study programme, for example, increased the volume of internships. Also, because of students and graduate's recommendations, the study program plan has been improved, for example, study practice Forest regeneration has been moved from the 8th semester to the 7th semester, increased volume for internships Organization, planning and management (by 1CP), thus responding to the call to organize more internships in companies of the field.

Students can evaluate the work of each lecturer and the content of the course by filling in anonymous questionnaires in the LLU IS system. Evaluation of lecturers and courses is very volatile (in the range of 2.5 - 5 (out of 5)) and depends on the number of respondents, so it is not used as a tool for evaluating the course as a whole, but each situation is evaluated separately, comments are also paid attention to and if necessary, they are discussed at the meeting of the Department or the meeting of the Methodological Commission and discussions are organized with the lecturer about the change of the course content or changes in the program plan are initiated. For example, the content of the study course Information Technology includes issues aimed at the use of information technology in the national economy. Basics of scientific research - the study course is created by combining the courses Research Methodology and Basics of Scientific Research. Practical forestry - the course includes certification and forest management planning. The amount of the study course has been increased by 1 CP. Forest regeneration - the course includes mechanization of forestry works. The amount of the study course has been increased by 1 CP

Within the framework of the academic bachelor's study program Forest Science, there is regular cooperation with representatives of the industry, who are also employers. Representatives of the industry are at the Convention, State Examinations Commission, are invited as guest lecturers (For example, study courses Logistics in the Forest Sector, Forest Regeneration, Practical Silviculture) review and / or supervise the final theses. Based on the recommendations of the industry, new study courses have been developed, such as Logistics in the Forest Sector and Risk Assessment in Forestry.

In order to ensure and guarantee a proper quality, each year the strengths and weaknesses, development potential, academic resources, materially technical base, internal financial provisions of the study programme are evaluated. All previously stated is evaluated in LLU Forest Faculty Council Convent, student self-government, student association Šalkone, in sittings of LLU Forest Faculty methodological commission and Silviculture Department. All changes to the legislation governing the studies are available to anyone in LLU website *MansLLU*.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

International cooperation centre delivers higher education exchange programmes of the European Commission, and within the framework of the bilateral agreements, students from LLU and LLU partnering universities are allowed to take advantage of studies, lecturing or experience exchange abroad.

By promoting expansion of LLU international cooperation network, taking care of the recognisability of the university and providing students and academic staff members with the necessary experience exchange, international mobility is an integral part of modern and innovative university

activity. The students have incoming and outgoing mobility options.

Study results and credits obtained during Erasmus+ studies are recognised and added by the director of Bachelor's study programme "Forest Science" according to the Rector's Resolution "On the procedure of academic recognition in LLU".

Generally, between the academic year of 2013/2014 and 2019/2020, 56 students from the Bachelor's study programme "Forest Science" participated in programme Erasmus+. Most of them (15) used this opportunity in the academic year of 2015/2016. 6 students took this advantage to study abroad in the academic year of 2019/2020. (Annex 5).

During the reporting period the students have been in 12 higher education institutions within the framework of an exchange programme, with highest attendance to Czech University of Life Science. Another popular choice was Aristotle University of Thessaloniki (9 times) and Estonian University of Life Science (7 times).

During the reporting period, 17 bachelor's level students have acquired various study courses at the Faculty of Forestry within the framework of the Erasmus + program. Most often they have been students from France and Italy (4 in both cases), the Czech Republic (3), and Spain (2). 12 students at the Faculty of Forestry have studied within the program KA-1. Most (10) were from Lithuania. Foreign students do not choose a specific study program, but individual study courses that provide the necessary set of knowledge, mainly so that when returning to their university, it would be possible to equate semester to semester.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Six faculties in a capacity of the basic structures are involved in delivery of Bachelor programme: Forest Faculty (Silviculture Department, Forest Management Department, Woodworking Department), Faculty of Information Technologies (Physics Department, Management Systems Department); Faculty of Agriculture (Institute of Soils and Plants Science), Faculty of Food Technology (Chemistry Department), Faculty of Environment and Civil Engineering (Environment and Water Management Department), Faculty of Economics and Social Development (Institute of Business and Administration) and LLU Language Centre. Large part of compulsory and restricted elective courses is delivered by the university lecturers from the Forest Faculty, while some courses – in previously mentioned structural units of LLU. Structural units involved in the programme are provided with the necessary study base, which is being constantly improved and developed. Steps are taken to modernise premises and equipment on a regular basis, to prepare methodological materials, promote professional development.

Practical sessions and seminars outside LLU are mainly supported by the National Silviculture Institute of Latvia "Silava" and National Scientific Research Forest Management Agency "Forest Research Station" working under the auspices of Latvia University of Agriculture.

LLU Fundamental Library offers its visitors various online databases (for example, CAB Abstracts; CRC Press e-books; EBSCO databases; EBSCO eBook Academic Collection; ScienceDirect journals; Scopus; Web of Science etc.) and databases in other media. The library has purchased a searching software PRIMO DISCOVERY, enabling simultaneous search in the subscribed and free online databases, electronic Joint Catalogue of national-level libraries, LLU FB databases (publications of LLU academic staff members, LLU Master Theses etc.). When registering with LLU IS user account, one can view his or her user account and extend loan issuing deadlines, subscribe for published materials, access full texts in the subscribed online databases, save search results. "Information Search Assistant PRIMO" is available in the Library's website. Access to online databases is provided 24/7 in LLU network, as well as for authorised users outside LLU network through EZproxy and LLU IS user account.

The most recent literature in the speciality written by local authors, academic staff members and foreign authors is available in LLU Fundamental Library and also Information Centre in the Forest Faculty during the studies where the students can access methodological materials for acquiring the course and also volumes of international scientific conferences and scientific journals. Students can use computers situated in the Information Centre of the Forest Faculty to read scientific publications; they can access electronic databases of scientific articles, too.

The most recent literature in Latvian and English is available also in the Silviculture Department, Forest Management Department and Woodworking Department.

E-studies must be used while studying for uploading learning and auxiliary materials, gathering and evaluating attendance of contact lessons, assessing tests and final exams, as well as engaging in interactive communication and presenting new courses.

During recent years by using EU co-funding, the existing laboratories (Laboratory for determining work environment, Wood Science laboratory, Hunting laboratory) is supplemented with modern equipment as well as a new laboratory has been created – Precise Forestry Laboratory, scientific laboratory of LLU Woodworking Department (equipment for determining physical-mechanical properties, determining physical-chemical properties, determining material surface properties and for previous preparation of materials) at 41 Street Dobeles. It lays a basis for offering new specialisation directions.

Multimedia projectors and classrooms with wireless internet connection are used in the course teaching, allowing to project relevant information in lectures and practical classes on the screen and using internet resources where necessary. Two computer classes (with 50 workplaces) are available for students in the Faculty, where the computers have special forest management planning computer software installed and also software for data processing and designing. Students can use computers located in the Information Centre of the Faculty for elaboration of their individual study papers.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

LLU Forest Faculty is very experienced LLU structural unit with characteristic respect for industry's heritage, high competence and academic staff well-respected in the industry. However, university lecturers are changed constantly, as the leading forest industry researchers and specialists with practical hands-on experience join the study process and research. Both doctoral students and university lecturers who recently acquired their degree are involved in delivery of studies. Involvement of doctoral students and new researchers creates a link between the study content and latest scientific research in the industry, encourages student participation in research, creates and strengthens interest in postgraduate studies. Doctor of Science (Ph.D) holding a scientific doctoral degree. In 2020, two candidates were conferred Agriculture and Fishery PhD in Forest Sciences. Two more doctoral degree candidates are expected to acquire their degree at the end of 2021.

Makeup of academic staff in the reporting period has changed due to various reasons. For example, the leading university lecturer of courses Chemistry, Biology of Forest Animals, Game Management was replaced due to retirement. University lecturers delivering courses Forest Regeneration, Forestry Nurseries, Dendrometry etc. were replaced because other specialists were involved.

Continuation of studies is ensured through developing communication among the academic staff members, maintaining and updating study materials in e-studies, as well as updating the course plan and description on LAIS website.

Currently 65 academic staff members deliver the academic Bachelor's study programme, of which 19 hold doctoral degree, 12 are associated professors or professors.

The Bachelor's study programme is delivered by elected academic staff (46%) and non-elected academic staff (54%).

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Academic staff members involved in delivery of programme "Forest Science", both from the Forest Faculty and other structural units of LLU, have proven to be knowledgeable and competent professionals each in the course they deliver lectures on.

Academic teaching staff involved in delivery of study programme has proper qualifications determined by the Law on Higher Education Institutions – “not less than five professors and associated professors, who are elected in academic positions in relevant university, are involved in compulsory part and restricted elective courses of the academic programme”(https://likumi.lv/doc.php?id=37967, only in Latvian).

Professional development of the academic staff members takes place every year in several ways:

- The academic staff of the Latvia University of Agriculture complies with the Law on Higher Education Institutions, LLU regulatory enactments and *Constitution* of Latvia University of Agriculture. The academic staff is entitled to engage in decision-making at the level of Faculties and university, including the work of LLU *Senate*. The academic staff is given the freedom of studies and research and it plays an important role in quality of the study process.
- The academic staff is given a chance to develop their professional competence, based on the scientific activities, thus strengthening a link between the education and science. Application of innovations in teaching methods and new technologies is supported.
- Academic staff members attend course Innovations in University Didactics every 5 years or for a period of 5 years, acquiring a 100-hour programme.
- The academic staff members participate in LLU Methodological Teaching Conferences biannually, enriching their knowledge with the latest information to improve study quality, apply technologies for teaching materials and other areas.

Teaching staff members delivering the specialised courses, develop professionally through qualification seminars, local and international scientific conferences, organised by LVMI Silava, AS Latvijas Valsts meži, State Forest Service, Latvian Plant Protection Service, cooperatives of private forest managers, for example, forestry service cooperative company “L.V. Mežs” etc.

Academic staff members from the Forest Faculty actively participate in the forest days and seminars (each academic staff member attends 3-6 seminars on average per year, and each seminar lasts for 2-8 hours). Topics of the seminars are very diverse: Silviculture, Forest protection and security, Game farm, Bioeconomy, Timber processing etc.

Lecturers of courses can participate in Erasmus+ programme both in experience exchange trips and university lecturers’ mobility.

Academic staff members from the Forest Faculty have attended experience exchange trips for 25 times to different 15 European universities in the reporting period. The most popular of them being Swedish University of Agricultural Sciences (4 times), Ecole Supérieure du Bois Nantes (3 times), Kauno kolegija/University of Applied Sciences (3 times).

The academic staff members who participated in lecturer’s mobility have attended 7 different higher education institutions for 20 times. Most often they visited Alexander Stulginski University (8 times), Polytechnic Institute of Viseu (4 times) and Estonian University of Life Sciences (3 times).

If in the beginning of the reporting period, experience exchange trips predominate, over some of last years the academic staff members chose to deliver lectures in mobility programme which indicates at qualification development. (with exception in academic year of 2019/2010 when due to pandemic and initial uncertainty about remote solutions the lectures were delivered abroad only by one lecturer).

Academic staff members develop their professional competence when engaging in collegial institutions – Doctoral Council (5 university lecturers), Latvian Association of Botanists (4 university lecturers) etc., as well as participating in the editorial board of journals (Baltic Forestry (4),

Research for Rural Development (1) etc.), heading of conference sessions in Latvia (Research for Rural Development, Students on their Way to Science etc.) and foreign conferences – in Bulgaria (GeoConference SGEM, “Hydrology and water resources”), Lithuania (Rural Development).

University lecturers publish articles in internationally indexed journals, such as iForest, Forests, Baltic Forestry, European Journal of Forest Research, Silva Fennica, BioResources, Agronomy Research etc., which are indexed in several databases, including Scopus and Web of Science; anonymously reviewed international scientific publications, including proceedings. International conference materials (Abstract), scientific popular and scientific methodological works (text-books, other publications) are published.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

During the reporting period the academic staff members were involved in various scientific research activities as participants or heads of institutions' projects and programmes – EU, Latvian Science Council, Ministry of Education and Science, Ministry of Agriculture etc. Thanks to the research programmes, created by LLU, for example programme Strengthening of Scientific Capacity in LLU, academic staff and doctoral students can compete for the financing devoted to the research.

The new doctors can also compete for the financing granted to postgraduate research support projects (1 new doctor), which is a significant achievement, providing a possibility for the new scientists to start a career and to develop their competences and add to the number of qualified specialists.

LLU is a participating organisation in LIFE-IP LatViaNature project where also academic staff from the Forest Faculty participate. The goal of the project is to introduce Natura 2000 Special Areas agenda in Latvia by ensuring favourable protection of EU level biotopes and species and also elaborating suitable and innovative approaches to solving topical nature protection issues.

Each year applications are submitted for projects financed by the state and EU structural funds, National research programmes, in cooperation with the academic staff members and researchers from several LLU faculties as well LVMI SILAVA, AS Country and other forestry companies in Latvia.

Results of the scientific research are presented in different international or local conferences. Forest Faculty organises conferences every year together with LVMI Silava, and academic staff members partake there as participants and present their research achievements and also in a capacity of listeners. The academic staff members actively participate also in international scientific conferences, congresses, symposiums in Latvia and beyond, both with verbal presentations and booth papers, for example, in several international LLU scientific conferences <https://www.llu.lv/lv/konferences>, international conference Sustainable management of natural resources – Baltic Sea region as the driving force, annual international scientific conference Research for Rural Development, annual international multidisciplinary scientific GeoConference SGEM (Bulgaria), IUFRO congress (2017), Worldwide Latvian Scientists Congress (2018) etc. University lecturers who supervise study papers and theses, invite students to attend conferences and publish results of their research, when working with students.

Results of the scientific activity are used in the delivered courses, updating their content and informing the students about industry topicalities, supervising the courses and theses. The newly acquired knowledge, skills and competences enhance study efficiency and bring the mastering of courses closer to the real work.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Academic staff members cooperate both within the framework of scientific activity and professional development. Also, during the sittings of Methodological Commission and Dean's office various events related to studies and extra-curricula life are discussed, and study programme's director and head of department update other course lecturers in this regard. In some cases, the academic staff members meet individually to discuss a particular topic.

Forest science is closely related to many other scientific disciplines, especially in processing of empirical data obtained, for example, mathematics, computer sciences, therefore academic staff members who have good knowledge of aforesaid are involved in the programme and courses, thus broadening the horizon of knowledge and competences to be acquired in the programme where it touches other scientific disciplines, and they also support cooperation among academic staff members and researchers from various faculties.

The Forest Faculty widely and actively cooperates with LVMI Silava and LVKĶI (National Institute of Wood Chemistry of Latvia) research institutes. Active cooperation both at the level of faculty and individual lecturers involve the Forest Research Station, which provides place for numerous

practical classes and traineeships. University lecturers from the Forest Faculty often engage industry specialists in their courses as visiting lecturers to discuss a particular topic. Usually, such traineeship is well-praised also by students because it demonstrates a link between the study content and scientific environment in the industry. In spring semester of 2020 such visiting lecturers were invited in courses Forest Regeneration, Forest Tree Improvement, Practical Silviculture and Management of Urban Forests.

Academic staff members from other structural units are involved as consultants, work supervisors or reviewers also during elaboration of the Bachelor thesis.

When evaluating the overall number of students in the programme (academic year of 2020/2021 on 1 October), in comparison to number of academic staff members (108/65), student-academic staff ratio in the study programme is 1 to 15.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	1_pielikums_Statistika_Statistikai-data_LV_EN.pdf	1_pielikums_Statistika_Statistikai-data_LV_EN.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	3_annex_compliance-with-the-national-education-standard_EN_MZ.pdf	3_pielikums_atbilstiba-valsts-izglitiba standartam_MZ_LV.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	4_pielik_Kartejums_Mapping_Mezzin_bak_lv-en.xlsx	4_pielik_Kartejums_Mapping_Mezzin_bak_lv-en.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	5_pielik_Studiju-palns-Study-plan_Mezzin_bak_LV_EN_prec.xlsx	5_pielik_Studiju-palns-Study-plan_Mezzin_bak_LV_EN_prec.xlsx
Descriptions of the study courses/ modules	Study_courses_Mezzin_bak_prec.rar	Studiju_kursi_Mezzin_bak_prec.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikumi_Mezzin_bak_en.rar	Diploms-un-pielikumi_Mezzin_bak_lv (1).rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU apliecinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	bak_stud_prog_Mezzinatne_AIP_atzinums_EN.docx	bak_stud_prog_Mezzinatne_AIP_atzinums.edoc

Food Hygiene (47640)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Food Hygiene</i>
Education classification code	<i>47640</i>
Type of the study programme	<i>Professional master study programme</i>
Name of the study programme director	<i>Dace</i>
Surname of the study programme director	<i>Keidāne</i>
E-mail of the study programme director	<i>dace.keidane@llu.lv</i>
Title of the study programme director	<i>Dr. vet. med.</i>
Phone of the study programme director	
Goal of the study programme	<i>Prepare highly qualified specialists - food inspectors, who know the principles adopted by Latvian, EU and international organisations regarding food chain, for work in LR Food and Veterinary Service, its regional administrations, sanitary customs inspection, which performs national level of food chain supervision and control, starting with sourcing of animal based production, processing, transporting, wholesale and retail of animals and production, public catering, control of import, export and transit.</i>
Tasks of the study programme	<ol style="list-style-type: none"> <i>1. To prepare professionally qualified specialists in food hygiene sector, who have the necessary theoretical knowledge and practical skills for planning safe manufacturing of food products, realisation and control thereof, and who are able to plan and conduct interdisciplinary scientific research in various food hygiene-related areas, who drive further development of the science and modern technologies.</i> <i>2. To promote development of the academic staff and integration of various specialists of natural sciences in area of food safety and quality.</i> <i>3. To provide an opportunity for MA students of the programme "Food Hygiene" to acquire the necessary skills to conduct independent scientific research and supervise research work in one of food hygiene areas at their choice.</i> <i>4. To facilitate further studies of MA students in doctoral programme.</i>

Results of the study programme	<p><i>When graduating from the professional higher education Master programme, a MA student can show in-depth and extensive knowledge when evaluating technological principles of food product sourcing and producing, can describe nutritional value of food, define food safety, quality and hygiene criteria, organise elaboration, introduction and maintenance of quality systems, describe prevention of foodborne diseases and work organisation, as well as acquire knowledge to define legal aspects for documentation and decision-making purposes concerning conditions for international food trade.</i></p> <p><i>Professional master is capable of interpreting physical, biochemical and microbial processes taking place during food product manufacturing, evaluate microorganism development modelling software, explain causes of various food product defects and elimination possibilities, can identify and prevent vital control points in food quality assurance systems.</i></p> <p><i>Professional master is capable of evaluating the technological processes of food products, organise safe food production as well as to introduce and maintain quality control system, basing on his or her knowledge of food hygiene.</i></p>
Final examination upon the completion of the study programme	<i>Master Thesis</i>

Study programme forms

Full time studies - 1 years, 2 months - latvian

Study type and form	<i>Full time studies</i>
Duration in full years	<i>1</i>
Duration in month	<i>2</i>
Language	<i>latvian</i>
Amount (CP)	<i>50</i>
Admission requirements (in English)	<i>Bachelor's degree or second level professional higher education in veterinary medicine, medicine, food science and food technology, agriculture, biology or chemistry, obtained in study programs lasting at least four years in full-time studies (160 CP)</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Professional Master Degree in Food Hygiene</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

Several changes have been introduced since the approval and delivery of the programme. Programme "Food Hygiene" initially was part time studies (1.5 years). Since the academic year of 2017/2018 it is delivered as full-time studies. Studies last for 1.2 years and are delivered in three semesters. The first semester has courses like Quality System in Food Chain, Food Chain Control, Foodborne Infections, Food Additives, Food Technology, Food Toxicology, Education and Psychology, Master Thesis I and Food Safety, which is a traineeship. The second semester has the following courses: Biostatistics in Food Hygiene, Genetically Modified Food, Food Usability Analysis, Food Hygiene and Inspection, Master thesis II, which is actually a paper elaborated by the MA student on the selected topic. The third semester is devoted to elaboration, execution and defense of the Master Thesis.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

79 MA students were admitted to the Master programme "Food Hygiene" between 2013/2014 and 2020/2021, and 49 of them have graduated and acquired Master's degree.

In the academic year of 2013/2014, seven MA students were admitted to part time studies and no one graduated that year. This time coincides with the change of the programme director and must be noted that no MA students have been admitted during previous two years due to insufficient number of potential students. In the academic year of 2014/2015, eight students were matriculated for part time studies, six have graduated. In the academic year of 2015/2016, seven students were matriculated for part time studies and seven have graduated. In the academic year of 2016/2017, no MA students were admitted, while eight graduated. The academic year of 2017/2018 saw changes as the programme was transformed from part time studies to full-time studies. In that academic year six MA students were admitted for full-time studies, however, no one has graduated. In the academic year of 2018/2019, eight students were admitted to full-time studies, six have graduated. In the academic year of 2019/2020, seven MA students were admitted to part time studies and seven have graduated. In the academic year of 2020/2021, no MA student was matriculated, as the necessary number of students was not achieved (five MA students), and seven MA students graduated this academic year.

In the programme "Food Hygiene" the Master studies were financed from the budgetary places or from private means of students. Between 2013 and 2018, when the studies were still part-time,

they were paid studies only.

With a shift to full-time studies in the academic year of 2017/2018, budgetary places were allocated to the programme. In the academic year of 2018/2019 there were six MA students, one of them paid for studies individually. In the academic year 2019/2020, seven MA students studied in budgetary places and three MA students paid for their studies individually, whereas in the academic year 2020/2021 all seven MA students studied in budgetary places (see Annex).

Not all students have successfully graduated from their programme. In the academic year of 2014/2015, one MA student chose to drop out of studies. In the academic year 2017/2018, two MA students chose to discontinue studies and three MA students were expelled for failure to fulfil the requirements of the study agreement. In the academic years of 2018/2019 and 2019/2020, two MA students chose to discontinue studies. The most popular reason for dropping out of the studies is inability to balance study and work life, and financial problems.

Master programme “Food Hygiene” so far has been offered and delivered in the Latvian language. Currently we focus on offering and delivering of this programme in the English language as of the academic year of 2022/2023.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Study programme “Food Hygiene” focuses on mastering in-depth special knowledge on organisation, creation and maintenance of food safety systems for food chain companies, and also about plant and animal-based products’ quality and methods for determining their safety, thus making sure that MA student understands, can plan and organise foodstuff production and quality control in entire production process, i.e. from cattle-shed/field to table.

The goal of the programme is to prepare highly qualified specialists – food inspectors, who know the principles adopted by Latvian, EU and international organisations regarding food chain, for work in LR Food and Veterinary Service, its regional administrations, sanitary customs inspection, which performs national level of food chain supervision and control, starting with sourcing of animal based production, processing, transporting, wholesale and retail of animals and production, public catering, control of import, export and transit.

Tasks of the programme “Food Hygiene”:

1. To prepare professionally qualified specialists in food hygiene sector, who have the necessary theoretical knowledge and practical skills for planning safe manufacturing of food products, realisation and control thereof, and who are able to plan and conduct interdisciplinary scientific research in various food hygiene-related areas, who drive further development of the science and modern technologies.
2. To promote development of the academic staff and integration of various specialists of natural sciences in area of food safety and quality.
3. To provide an opportunity for MA students of the programme “Food Hygiene” to acquire the necessary skills to conduct independent scientific research and supervise research work in one of food hygiene areas at their choice.
4. To facilitate further studies of MA students in doctoral programme.

The qualification is not awarded because, the professional master's study program "Food Hygiene" was developed on the basis of the Cabinet Regulation No. 322 "Regulations on the Classification of Education in Latvia" (Latvian only), which can finally be awarded a degree or a degree and a qualification. During the study process, Master's students acquire a large part of the study courses that are related to Veterinary Medicine, eg food infections, food toxicology, food hygiene and inspection. These study courses teach in depth about infectious diseases, their agents, types of agents, pathogenicity and their impact on the quality of products of animal origin. Therefore, this program is linked to the group of educational programs Veterinary Medicine.

Admission requirements for previous education to start studies in the master's study program "Food Hygiene" are bachelor's degree or second level higher professional education in veterinary medicine, medicine, food technology, agriculture, biology or chemistry. Prior education must be four or five years of study with a basic knowledge of chemistry and microbiology.

The interconnection of the title of the study program, the degree to be obtained, as well as the goals and tasks and admission conditions has been evaluated in detail during the study program development in 2003, regularly evaluated during the implementation period and the project "Improvement of Latvia University of Agriculture Management" No. 8.2.3.0/18/A/009, where industry experts were involved in the evaluation of study programs ("Services of industry experts for evaluation of study program content and provision of recommendations within the framework of project No. 8.2.3.0/18/A/009"). The study results to be achieved reflect the coherence and fulfillment of the title, goal and tasks of the study program. In the Master's study program "Food Hygiene", the aim of studies is to prepare leading specialists in both production and public administration and science, who have subordinate tasks and achievable results. The results to be achieved include knowledge of the latest trends in both manufacturing and science. Much attention is paid to skills and competencies related to information analysis, critical thinking, as well as presentation and discussion skills. The study courses have been revised in accordance with the procedure established by the Latvia University of Agriculture, which facilitated the specification of the results to be achieved by the study courses and the requirements for obtaining credit points.

The central documents governing the relationships between a student and LLU are matriculation documents and study agreement. Applicants are admitted to Master programme with the annual matriculation order issued by the rector. After graduating from the studies, a degree - Professional Master Degree in Food Hygiene (Mg.cib.hyg.) is granted by the State Examinations Commission on the basis of the annual order of the rector. The Commission comprises the practising specialists (50%) and university's academic staff (50%). After a successful graduation of the study programme and defended Master Thesis, the Professional Master Degree in Food Hygiene (Mg.cib.hyg.) is granted.

Outcome results in the programme "Food Hygiene"

When graduating from the professional higher education Master programme, a MA student can show in-depth and extensive knowledge when evaluating technological principles of food product sourcing and producing, can describe nutritional value of food, define food safety, quality and hygiene criteria, organise elaboration, introduction and maintenance of quality systems, describe prevention of foodborne diseases and work organisation, as well as acquire knowledge to define legal aspects for documentation and decision-making purposes concerning conditions for international food trade.

Professional master is capable of interpreting physical, biochemical and microbial processes taking place during food product manufacturing, evaluate microorganism development modelling software, explain causes of various food product defects and elimination possibilities, can identify and prevent vital control points in food quality assurance systems.

Professional master is capable of evaluating the technological processes of food products, organise safe food production as well as to introduce and maintain quality control system, basing on his or her knowledge of food hygiene.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

The master's study program "Food Hygiene" was created based on the suggestion of the Food and Veterinary Service (FVS) for the need for such specialists. The need for specialists who will be competent, trained to perform the necessary manipulations to evaluate food products in the production process and their sales locations. Specialists who, if necessary, will learn to properly assess the compliance of food production and / or processing companies with hygiene standards, as well as to take samples for the detection of microbial contamination.

Study programme "Food Hygiene" is aimed at advanced specialised knowledge about organisation, creating and maintenance of food safety assurance system in food chain companies, as well as methods to determine plant and animal-based product quality and their safety. Courses to be mastered in the programme are created to embrace the knowledge and skills required for the Food Hygiene and Inspection. MA students acquire the following courses during studies:

Quality Systems in Food Chain, where students learn philosophies and programmes of quality management authors, as well as in fundamental theoretical and practical fundamental questions for introduction and management in food production company. Students acquire information about integrated and specific quality systems in a food company. They apply OHSAS standard requirements to identify the work environment risks in food processing company and master FMEA quality management tools and quality cost analysis methodology. They acquire knowledge about application of TACCP and VACCP principles in assessment of possible threats in food production company.

Food Chain Control, where MA students learn regulations of Latvia and the European Union, with international principles governing food safety and quality assessment, as well as responsibility to comply with them as well as about control mechanisms. The course covers fields associated with food hygiene, quality and safety principles, food labelling, official food control, protection of consumer rights.

Foodborne Infections, where various foodborne infections caused by phylum Salmonella, Escherichia, Campylobacter, Listeria, Vibrio etc. microorganisms, food toxicity caused by Clostridium, Staphylococcus etc. microorganism toxins and also virus-triggered foodborne infections are studied. As students master this course, they are introduced to characteristics of these

microorganisms, identification methods in food products as well as circulation of these microorganisms and control measures in entire food chain. They learn the fundamentals of epidemiological examination in case of diseases triggered by foodborne infection.

Food Additives is a course where the MA students learn about the goals of food additive use and their functions in food products, regulations governing their use and international additives' nomenclature. They learn about main groups of additives, most used substances, their origins and assessment. They get to know advantages of use and principles of weighting possible risks. Along with the basic issues, the MA students independently learn about use of food additives in certain food industry and analyse impact of individual food additive group on product quality.

Food Technology is a course where the MA students acquire knowledge about trends of food product manufacturing both in terms of food product health status and safety perspective.

Food Toxicology is a course where students learn about notion of toxic substances, types of impact of toxic substances on human, types of chemical pollution in food as well as control principles and responsibility.

In course **Education and Psychology** MA students acquire knowledge and skills in education and psychology at the level of analysis, synthesis and evaluation; they develop their competences, incl. ability to creatively and critically evaluate education setting and pedagogical situations, they are able to integrate and use knowledge and skills in various fields and in context of teaching activity. As a result of the course, the MA student develops a research and evidence-based world view, interdisciplinary perspective which is rooted in values of education culture and also focuses on generating new knowledge.

In **Biostatistics in Food Hygiene** the students learn about biostatistic regularities, which are fundamental to generalisation of results obtained in the research and drawing of conclusions. The MA student has the necessary competence to obtain and process Master Thesis data with relevant computer software, interpret the obtained results, draw conclusions.

Genetically Modified Food is a course where the MA students get acquainted with application of modern biotechnology methods and applicable legislation to food production which contains genetically modified organisms and their recognisability.

Analysis of food usability, where students learn and can get knowledge about impact of various factors on food product decay processes; determining of the expiration date and its calculation and prognosis. The problems discussed in the course are: main types of food product decay; methods to determine degree of food product decay (identification, innovations, analysis of the obtained results); decay management in grain, dairy, food etc. processing companies (risks, microbial safety, management, product development and sales, consumer); modern and innovative possibilities in control of food product decay (microbiological, chemical, physical) processes; determination of expiration date.

Food Hygiene and Inspection is intended for mastering the assessment of animal-based product quality and safety. The subject includes: meat hygiene and meat inspection course, which teaches beef, pork, poultry etc. animal slaughtering techniques, slaughtering hygiene, Best Production Practice (BPP) and self-assessment system (HACCP) in slaughter houses. Students learn the basic hygiene for fish and fishery products, milk and dairy products, eggs and egg products, honey, fruit and vegetables,

All courses included in the programme are designed to meet the needs of the industry, labour market and science. MA students in the courses are introduced to the recent scientific trends within the framework of each industry. When elaborating their Master Theses, the MA students are often

involved in the scientific research, which is being performed in some research project at that moment. So, it must be noted that choice of the topic and elaboration of Master Thesis goes hand in hand with current research in the food hygiene.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

The **goal** of professional higher education master programme “Food Hygiene” (henceforth – programme) is to prepare highly qualified specialists – professional MA students specialising in food hygiene who can work in food chain companies and state administration bodies, and who can apply their knowledge to the area of food safety in entire food chain, to elaborate and maintain food safety maintenance systems in companies and be able to practically supervise and perform research in any selected food safety area.

The goals and results to be achieved in the study courses are stipulated in the study process. The aim is for the master to be able to work in a food production company or FVS structure after making a diploma, to make decisions and, if necessary, to prevent low-quality food products from entering the market. Thus, the knowledge provided in the study courses provides an interconnection starting with the external evaluation of various food products and ending with the laboratory evaluation of food products. For example, in the study course “Food Toxicology” master students acquire knowledge about the formation of toxins in the environment, as well as about their routes to food. In the study course “Food Infections” you gain knowledge about the most current food-borne infections in Latvia, the EU and elsewhere in the world. Able to isolate infectious agents, recognize, identify their genera, species. When developing their master's theses, students are able to statistically process and interpret the obtained results thanks to the study course "Biostatistics in Food Hygiene".

In the course Foodborne Infections, students acquire knowledge about the most common foodborne infections, their causes, biological properties as well as harm caused by foodborne infections to humans. Meanwhile the course Food Hygiene and Inspection brings knowledge on how to prevent such infections and avoid food poisoning.

The same coherence principle is used also in other courses, keeping in mind that they are complementary and build on each other.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

Acquisition of courses in the study plan of the programme is achieved in lectures, seminars, practical classes, consultations, discussions and individual studies. A major emphasis in the study process is put on individual and research work of each MA student, as well as individual work with the scientific supervisor. A particular emphasis is put on using of interactive methods in studies – active participation of the MA students in discussions during the seminars. In seminars students become experienced in presenting their knowledge to others and participating in discussion. Each student receives handouts for the course. Communication among the academic staff members and MA students can be implemented via e-studies, e-mail and in individual consultations. Student knowledge is assessed in the professional Master programme „Food Hygiene” according to the Study Regulation of LLU (confirmed with a decision No. 7-28 / 09.06.2010 of the Senate) in a 10-point system.

Various Internet platforms are used in the study process. The Moodle platform has gained wide application at LLU, which is constantly being improved. In the Moodle system, teachers place study materials, instructions for students to acquire study courses, tasks for independent work, questions for self-control and test papers, as well as this platform is used for communication with students. In each study course, during the study, master students are tested in the form of colloquia, tests, but at the end of the study course an exam must be passed. Consequently, master students are assessed whether the relevant topics have been acquired in study courses or not. Failed to pass the test or exam, after improving knowledge can to re-pass. Assessment methods comply with the principles mentioned in the regulations of the Cabinet of Ministers No. 512 (Regulations on the State Standard of the Second Level Professional Higher Education).

Content of the programme is acquired and assessed according to the goals and requirements for each particular course. Each course has its assessment criteria, offering tests of various forms and types. At the end of each course, student takes a written and/or oral exam or test. Results of the studies are controlled and assessed: during the semester; in tests after complete acquisition of the study subject; after acquisition of full programme – elaboration and defense of the Master Thesis. Goal of each test and exam is to identify the level of theoretical knowledge and skills and competences of the MA student to apply this theoretical knowledge to further activities to perform tasks. Major part of the Master studies comprises scientific work, which is concluded with elaborated Master Thesis that needs to be defended.

The student-centered approach is implemented throughout the study process:

- The results of the study course are clearly defined, and they are introduced to the master students, if necessary, the teaching staff works individually to achieve the study results - recommends additional literature, organizes additional consultations.
- Assessment is designed to make it possible to ascertain whether and at what level the planned learning outcomes have been achieved.
- At the center of the study process is a master student who is able to work independently.
- For independent work, master students have access to the Internet at faculties, Scientific articles on current topics can be found in the Library of the Latvia University of Agriculture, as well as in the VMF Information Center. Information on specific topics can be obtained from study course leaders.
- Assessment of achievements is designed to make sure that the planned study results have been achieved at the appropriate level.
- It is understandable how the set of results of individual study courses forms the results of the study program.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the fulfilment of the tasks set for students during the traineeship.

In programme "Food Hygiene" MA students have a research traineeship, which takes place in Semester 1 of the first year for six weeks. Traineeship is mandatory for professional higher education, full-time Master study programme "Food Hygiene" in the Faculty of Veterinary Medicine. The traineeship takes place in a food-chain company or public institution relevant to that field. LLU has established cooperation with the Food and Veterinary Service, which helps MA students with traineeship places. MA students may choose their traineeship place individually. Before the traineeship, the MA student, LLU and traineeship provider enter in trilateral contract.

During the research traineeship the MA student gets familiar with food control and supervision principles and gathers materials necessary for the scientific study to an extent possible and later uses them for his or her research activity. The student learns skills to identify critical points in the food chain, becomes acquainted with the necessary scope of documents, how to fill out and execute them. Traineeship, in fact, is an effort to bridge knowledge acquired in the courses to practical skills in real life,

During the traineeship the MA students describe their knowledge and skills obtained in relation to food control and supervision in their traineeship report (volume: up to 20 pages). The report must be submitted to the course supervisor until the specified deadline. The traineeship report must be defended as a presentation (up to 10 minutes) in the deadline specified by the course supervisor. The traineeship report (written and presentation form) is assessed in 10-point system as stated in the Study Regulation of LLU and it is a Pass/Fail assessment.

In the master's study program "Food Hygiene", internships are mainly provided by the FVS. The program director, if necessary, helps students to choose the most suitable internship place in order to complete the planned program. Before starting the internship, master students can express in which of the FVS regions they want to do the internship. One week before the start of the internship, the FVS sends information on whether the internships selected by the master students will be available. In case the FVS practice cannot be offered in the place chosen by the Master's student, another place is offered. For example, the Master's student wanted to do an internship at the Jelgava FVS Office, but the FVS offers an internship place in Riga. There is a possibility that in case the Master's student has arranged an internship in one of the food production institutions, the internship is also accepted. During the internship, Master's students get acquainted with the company's structure, duties to be performed, legislation. Participates in the inspection of various food production to trade institutions, acquires skills in food sampling, labeling for further laboratory examination.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

A Master Thesis is a research, goal of which is to provide assessment of the student's readiness to use the obtained knowledge and skills in solving research-related and professional problems.

Requirements and procedure of executing applicable to the Master Thesis is defined by the Methodological Instructions elaborated and approved by VMF Food and Environment Hygiene Institute (PVHI). Master Thesis elaborated by the MA student is discussed and assessed in an extended PVHI sitting. After a presentation of the Master Thesis, hearing out of opinions, commentaries and recommendations of the scientific supervisor, discussion participants, the extended sitting of the institute runs an open voting, which leads to a decision on the readiness of relevant Master Thesis to be defended and promoted. Reviewers of the Master Thesis are also approved in the sitting. Master Thesis is defended in presence of the State Examinations Commission. Meanwhile the MA student has 15 minutes to explain the topicality of the subject chosen, goals and tasks, research results and conclusions. Having heard the student's report, getting acquainted with the thesis' supervisor, written assessment of 2 reviewers, hearing the answers to the posed questions, discussion, the commission makes its final decision in a closed sitting by open voting. Final works are evaluated a grade passed or failed. In case of identified plagiarism, a decision on plagiarism is made by the State Examinations Commission.

Topics chosen for the final papers are very different, nevertheless it must be noted that all Master Theses, which were defended, were topical both for the industry and production. Topics and methodology of the Master Thesis are discussed between the MA student and the supervisor. In majority of cases the research section of the thesis is elaborated within the framework of an existing project.

The chosen topic of the Master Thesis is usually related to the assessment of food quality indicators. Between 2013 and 2020, five Master Theses about dairy product microbial pollution, quality changes during storage were defended.

10 Master Theses about microbial pollution of meat products, impact of smoking on meat products, change of beef meat quality in maturing process and other indicators of meat product quality have been defended.

Four Master Theses about creating plant-based products and quality assessment in finished products have been elaborated and defended. Four theses have looked into the quality of various fruits and their by-products.

Three Master Theses have researched water quality both in residential wells and bore-holes, and in various food processing companies and animal stalls.

Quality of fish and fishery products was researched in three Master Theses.

Two Master Theses were written about honey quality. One of them studied presence of the toxic substances in honey, and other – potential presence of microorganisms.

There were also two Master Theses researching the catering companies. One thesis researched the analysis of microbiological pollution hazard in National Armed Forces catering units, whereas other one researched microbiological contamination in a closed catering facility and handout areas respectively.

There was a research on microbial pollution risks in rye bread during the production process, and a research on quality of various flour products.

Master's students, during their studies, develop their master's thesis. In order for the master's thesis to be developed, especially for the research part, LLU provides master students with laboratories and the necessary reagents. Both VMF and PTF are laboratories equipped with the necessary equipment and methods. The Master's student together with his / her supervisor agrees on what will be done to achieve the set goals and work tasks. Some of the students work on their work within the framework of project.

In the study period from 2013 to 2020, five master's theses have not been defended. Two master's students were exmatriculated at their own request. Three master students were exmatriculated for non-payment. One of the master students is on academic leave.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

Master programme "Food Hygiene" conducts anonymous surveys of existing and former students aimed at improving the studies. Surveys both on the programme in general and individual study courses are organised. Thanks to the feedback, the students can express their opinion and wishes about the programme, its structure and organisation.

In October 2014, seven part-time MA students evaluated the acquired programme and expressed their view on the studies anonymously. The evaluation was given in 5-point system, where 5 points stood for high evaluation and one – for low evaluation. The courses included in the programme were evaluated with 4.3 points, and cooperation with the supervisor of the final paper – with 4.7. Materials and technical equipment in classrooms / laboratories were evaluated with 4.4 points. Practical application of professional field-compliant competence and knowledge obtained in the studies was evaluated with 4.3 points. Problem-solving and organisational skills developed during the studies were evaluated with 4.4 points. Usefulness of the traineeship was evaluated with 4.7 points. General evaluation of the acquired programme received 4.7 points.

At the conclusion of each semester, MA students can evaluate also courses in LLU Information System. The courses can be evaluated both in terms of content and teaching. It must be noted that MA students have been rather reluctant to evaluate the courses between years of 2013 and 2020, and only a small number of students participated in the evaluation. Courses were not evaluated for academic years of 2013/2014, 2015/2016, 106/2017.

In the academic year of 2014/2015, only three out of seven MA students contributed to the evaluation. In the academic year of 2018/2019, the courses received evaluation between 3.9 and 5 both in terms of content and teaching. Similar evaluation was observed in the academic year of 2019/2020, when the content and way of teaching of the courses were evaluated between 3.8 and 5.

Employers' survey was carried out in 2012. The following questions were posed to employers and they gave the following answers:

Are specialists holding a Master's degree demanded in Latvia? 15% of them answered that they are highly demanded, 77% responded that demand is average and 8% of them said that there is no relevant demand.

When asked about a possibility for a MA student to do the research during the traineeship, 54% of the surveyed employers said that such possibilities exist, 31% said that there are partial possibilities, and 15% told that the company cannot offer any research. Answering a question if an employee holding a master's degree contributes to the prestige of the workplace, 92% of respondents confirmed that it would improve the prestige, and 8% of the respondents did not have an opinion in this regard. The employers also had to answer to a question if they preferred an employee with a Master's degree in their company. 92% of them said that they'd appreciated it and would prefer such employees, whereas 8% told that Master's degree would not be a decisive

aspect.

They were asked if the employees with the higher education are interested in studying in the Master programme. 54% of employers thought their employees are interested, 30% of employees told they are not interested, whereas 15% of respondents did not know if their employees are interested. When asked what the motivating factors for employees to start Master studies are, the employers responded that in 90% of cases it was employees' initiative, and only in 8% of cases it was recommended by the employers.

Noteworthy, during the last three years the surveys in a form of questionnaires have not been conducted in the Master programme "Food Hygiene". There were discussions with students in person to better understand what they find useful in the programme and what improvements they could propose. When preparing the material for program accreditation, discussions were held with the alumni. The main conclusion from the alumni part was that the courses of the programme are interesting and suitable to future qualification. They also noted traineeship as an important and irreplaceable part of studies. They mentioned increase of the volume of certain courses at the expense of the traineeship. For example, they suggested to increase the practical part of the course "Food Hygiene and Inspection" thus allowing to strengthen the knowledge in practical sessions.

Based on the recommendations of the master students' questionnaires, study materials have been supplemented and improved in some study courses. For example, in order to deepen the understanding of food control, in the study course "Food Chain Control" master students acquire not only knowledge about Latvian and European Union regulations, international principles in food safety and quality assessment, but also study material supplemented with areas related to with the principles of food hygiene, quality and safety, food labeling, official food control, consumer protection.

Within the study course "Biostatistics in Food Hygiene" the initially considered information about the choice of the object, its justification related to the topic and tasks, description of statistical indicators, was supplemented with choices of statistical data analysis, presentation of results in tabular and graphical form, as well as theoretical basics and practical application.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

There has been no incoming or outgoing mobility in the study program.

During their studies, Master's students have the opportunity to go to the ERASMUS+ exchange program, but they do not use this opportunity due to the short study time (1.2 years), as well as because all Master's students are employed and practically impossible to use this mobility.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision,

scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Courses included in the Master programme “Food Hygiene” take place mainly in the premises of the Faculty of Veterinary Medicine (VMF) and Faculty of Food Technology (PTF). Lectures and seminars take place in classrooms, and lab works – in the premises of faculties’ laboratories. The faculties have their study labs where the MA students can elaborate their Master Theses. LLU labs, such as Scientific Lab of Biotechnologies, are available for MA students to do their research.

The informative basis is provided by LLU Library offering the following databases: CAB Abstract, CRC e-books, Science Direct Journals, Scopus, Sci Val, Web of Science, Lursoft etc. In LLU Library students can use computers with internet connection, get books, periodicals without any charge. Students who pay for their studies can copy and print materials, scan and bind the printed materials (detailed information is provided in Part 2, Section 3.3 of the report)..

All faculties provide Wi-Fi which can be used for searching the scientific publications.

Students studying in the Faculty of Veterinary Medicine have access to the library with all the necessary literature for studies, also make copies and bind materials. If needed, they have stationary computers that the students can use.

Number of study places from public funding are stipulated in a trilateral agreement between the Ministry of Educational Sciences (IZM), Ministry of Agriculture (ZM) and Latvia University of Agriculture (LLU). It is defined in the trilateral contract on funding for 2020 year that the basic costs of one study place is 1,518.98 EUR, study level ratio for Master programmes is 1.5 and social provision of the study place for Master programme is 164.34 EUR, study cost ratio in education in the thematic area for professional Master programme “Food Hygiene” is 1.8 (ratios for each thematic education area vary, they are stipulated in the Regulations of the Cabinet of Ministers “Procedure by to which higher education institutions and colleges are financed from the state budget”), costs per one student of the professional Master programme “ Food Hygiene” is 4,264.88 EUR.

Every year the LLU Senate confirms distribution of revenue and expenditure of LLU combined budget structure, which is prepared in compliance with the law “On the State Budget” annually passed by the Saeima, and annual order of the LLU rector “On Planning of LLU Combined Budget”. The combined budget is controlled and audited by an external sworn auditor, whose opinion and report are reviewed and confirmed by the Senate.

Before the revenue and expenditure of LLU combined budget are approved in the Senate, it is reviewed, discussed and approved by the Action Group for Resource Utilisation and Development comprised of the rector, vice-rectors, chancellor, Director of LLU, deans of all faculties, head/CFO of the Resource Accounting Centre, head of the Finance Planning Centre, chief economic officers, main specialists in the real estate and legal matters.

Distribution of revenue and expenditure approved in LLU Senate determines that 80% of the assigned state funding comprises remuneration and 20% comprises other costs. 60% of funds from paid studies are spent on remuneration costs and 40% – other costs, 20% of which are in direct

control of the Faculty delivering the relevant study programme. Volume of funding of the scientific base is calculated and granted annually from the active scientific work. Scientific base funding, amounting to 50%, can be spent by the Faculty, and 50% are intended for covering the central costs. Scientific funding comprises the funds attracted for project implementation. Tuition fee in programme “Food Hygiene” is 950 EUR per semester.

Distribution of LLU combined budget consists of estimates of the structural units / Faculties where the costs are divided by their type of expenditure.

In 2020, the specific weight of the costs in the Master programme “Food Hygiene” comprises:

- Wages - 77%
- Scholarships - 3%
- Products and services - 17%, incl. utilities - 6%
- Building of the fixed capital - 3%

In general, VMF, PTF and LLU Research Laboratory of Biotechnology equipment, software and other laboratory equipment ensure appropriate and high-quality implementation of the study program.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

11 academic staff members were involved in the Master programme “Food Hygiene” during the reporting period. The academic staff members represent the Faculty of Veterinary Medicine, Faculty of Food Technology and Faculty of Engineering. All academic staff members engaged in the study process are professionals of their field and their daily work involves giving lectures in courses with similar content to students in their faculty.

Between 2013 and 2015, the composition of academic staff has not changed. Change of the university lecturers in the course “Education and Psychology” took place in 2015 and 2017. Change of the university lecturers in the course “Methodology of Research” took place in 2018 and the course was also renamed as “Biostatistics in Food Hygiene”.

Due to discontinuation of the employment contract, LLU in 2018 changed its university lecturers in course “Food Marketing”. In a transition period from part time studies to full-time studies, one and the same academic staff member does not give lectures on courses “Foodborne Infections” and “Food Hygiene and Inspection” in 2019. Lectures in these courses are given by the academic staff member who was involved in elaboration of the course and lectures on similar courses for the

students of the Faculty of Veterinary Medicine.

Programme directors are changed in 2019. As a result of the change of directors, courses “Master Thesis”, “Master Thesis I”, “Master Thesis II” and “Food Safety” are taken over by the new director.

It must be noted that the change of the academic staff members does not have a significant impact on the courses, because, as already said, all academic staff members involved are professionals of their field.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

LLU academic staff members’ involvement and employment is governed by the Regulation “Regulation of the Latvian University of Agriculture on Academic Positions” adopted by the LLU.

Number of positions of professors, assistant professors and assistant professors in relevant science sub-branches is aligned with the financial possibilities and needs of the program delivery, as decided by the LLU Senate following a decision of the Board of Faculty. Assuming of the academic position in LLU is subject to an open competition, stipulated in the Regulation on Academic Positions in LLU.

A person who was elected in the academic position enters into the contract for the term of that position.

Distribution of the academic staff members in the Master programme “Food Hygiene” by academic positions (see Table 4.2.1.)

Table 4.2.1.

Distribution of the academic staff member by academic positions

Academic staff members	Quantity	
Professors	3	30
Associated professors	5	50
Visiting university lecturers	1	10
Readers	1	10
Total	10	100

As one can see in the table, three of the academic staff members of those involved in the programme are professors, five are associated professors, one visiting assistant professor and one lecturer. Four academic staff members from VMF Food and Environment Hygiene Institute, five academic staff members from the Faculty of Food Technology and one academic staff member from the Faculty of Engineering are involved in delivery of programme courses. All academic staff members involved are professionals in their speciality and they upgrade their skills on a regular basis by attending various conferences, seminars, participating in projects as researchers and project managers, and also partaking in various activities, such as ERASMUS exchange program. The advanced knowledge is further used in lectures, seminars, laboratory work of the studies.

Between 2015 and 2020, the university lecturers have participated in more than 120 conferences and seminars. They have upgraded their professional activity both in local seminars as the lecturers and read lectures abroad. The lectures were delivered in different countries, such as Italy, Turkey, Slovakia, Kazakhstan, Tajikistan.

A list of full professional upgrade courses undergone attended by each academic staff member:

Professional upgrade in the 9th European Food Safety Lecturers' Seminar organised by the Natural Sciences University of Estonia. Venue: Tallinn, Estonia. Date: 18-19 June 2019. Professional upgrade in the EU The best training for safer food in organised courses "Classification of Beef Carcass" Venue: Ceva, Italy. Date: 20-22 September 2017. Professional upgrade event FOODCOST "Food Quality and Consumer Behaviour Studies" Venue: Slovakian University of Agriculture in Nitra. Date: 16-18 August 2017. Professional upgrade. Professional upgrade, experience exchange in Slovakian national government programme. Venue: Faculty of Biotechnologies and Nutrition Science, Slovakian University of Agriculture in Nitra. Date: 28 May - 28 August 2017 Professional upgrade in Latvia University of Agriculture, Academic conference "Going Towards Accreditation of Study Directions/Programmes". Venue: Latvian University of Agriculture. Date: 26 January 2018

27-28.11 and 04-05.12.2017 – courses "Organising and delivery of studies within the framework of the Latvian Rural Development Programme 2014-2020, event "Knowledge Transfer and Information Events", sub-event "Professional Education and Events of Skill Mastering" (LAD contract No. LAD030816/V35) Area of study course: Requirements for plant-based or animal-based product processing (food products mentioned in Annex 1 to the Contract on EU activities, except for fishery products). Study course Elaboration of New, Competitive Niche Product (incl. elaboration of receipt, price calculation, trademarks). Specialisation: Use of various grains in elaboration of new products. (4h) 06-07.04 and 21.04.12.2017 – courses "Organising and delivery of studies within the framework of the Latvian Rural Development Programme 2014-2020, event "Knowledge Transfer and Information Events", sub-event "Professional Education and Events of Skill Mastering" (LAD contract No. LAD030816/V35) Area of study course: Requirements for Plant-based or Animal-based Product Processing (food products mentioned in Annex 1 to the Contract on EU activities, except for fishery products). Study course: Upgrade and Development of Agriculture Product Manufacturing and Technologies. Specialisation: Beer brewing technology. (1h) 10-11.02 and 16-17.02.2017 – courses "Organising and Delivery of Studies within the Framework of the Latvian Rural Development Programme 2014-2020, event "Knowledge Transfer and Information Events", sub-event "Professional Education and Events of Skill Mastering" (LAD contract No. LAD030816/V35) Area of study course: Requirements for Plant-based or Animal-based Product Processing (food products mentioned in Annex 1 to the Contract on EU activities, except for fishery products). Study course: Elaboration of New, Competitive Niche Products (incl. elaboration of receipt, price calculation, trademarks). Specialisation: Fruit, berry, vegetable soft drinks. (4h) 08-12.05.2017 – experience exchange trip to "University of Chemistry and Technology, Faculty of Food and

Biochemical Technology”, Prague, Czech Republic. Participation in ERASMUS+ program (reading of lectures (8h) to MA students)07-11.11.2016. – BOVA intensive Master level course “Detection Techniques for cereal Quality Assessment” supported by the BOVA University Network held in Latvia University of Agriculture. Course value 3 ECTS (five working days, course leader) (certificate Reg. No. 2.5.-15/87, 11.11.2016).06.06-09.06.2016. – experience exchange trip to “Universidad Politecnica de Valencia (UPV)”, Valencia, Spain. Participation in ERASMUS+ programme (reading of lectures (8h) to MA students)

LLU academic staff members, including the university lecturers involved in the study programme, have a successful cooperation with the Latvian Rural Consultation Centre in Ozolnieki, the Ministry of Agriculture, Food Safety, Animal Health and Environment Scientific Institute “BIOR” where joint projects are implemented, lectures are read and collective seminars and conferences are organised.

Besides, procedure of professional upgrade is determined by the Regulations of the Cabinet of Ministers, “On Education and Professional Qualification Required for Teachers and Professional Upgrade of Teachers” (likumi.lv). Regulations determined that academic staff members obtain the necessary pedagogic qualification in continuing education professional upgrade programs regarding innovations in higher education system, university teaching or pedagogical work management in the volume of 160 academic lessons until the end of election term in the academic position. For this purpose, LLU has a higher education upgrade programme for academic staff members “Innovations in University Teaching”. Goal of the programme is to add to the knowledge of higher education teachers in university teaching and possibilities to apply it to teaching activities. A certificate is granted upon mastering this programme.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

Associate professors involved in the Master programme “Food Hygiene” are professionals of their field. It is witnessed by engagement in projects and writing of the scientific publications. For a period between 2013 and 2020, the academic staff members have participated in more than 86 projects. Part of the projects are of international significance, another part – at national level in Latvia. Students who elaborated their Master Theses participated in some projects. One Master Thesis has received very high assessment from the development financial institution ALTUM, LLMZA and LLU on topic “Evaluation of antibacterial impact and qualitative properties of Japanese quince” on 07.06.2019. Some projects are elaborated in cooperation with the Latvian Rural Consultation Bureau, Ministry of Agriculture, and Food Safety, Animal Health and Environment Science Institute BIOR. Cooperation has resulted in a possibility to attract MA students to elaborate their works and publications.

Projects and research have resulted in important publications, which were included also in SCPOUS and Web of Science databases (more info about the list of publications find in CV of each academic staff member).

13 publications were marked as the most important.

Project implementation has led to acquisition of 9 patents:

- Patent WO 2019/229507 A1 “Pig feed additive for prophylaxis of antibiotic resistant *coli*” (date of international publishing 05.12.2019.) (Patent Cooperation Treaty Application);
- Patent WO2017010856 A1 “Composition for treatment of subclinical mastitis of cows” (19.01.2017) (Patent Cooperation Treaty Application);
- Patent LV15071B “Composition for treatment of subclinical mastitis of cows” (20.02.2016.);
- Patent WO2015047064-A1 “Antibiotic free feed additive for piglets from Jerusalem artichoke, *lactobacillus reuteri* and *pediococcus pentosaceus*” (02.04.2015.);
- Patent WO2015047063-A1 “Feed additive containing Jerusalem artichoke and *pediococcus pentosaceus* for laying performance and egg quality” (02.04.2015.);
- Patents LV14772 “Feed additive containing Jerusalem artichoke powder and *Helianthus tuberosus* and prebiotics *Pediococcus pentosaceus* for feedlot pigs” (since 20.02.2015);
- Patent LV14773 “Feed additive containing Jerusalem artichoke powder and *Lactobacillus reuteri* for increasing productivity of broilers” (since 20.02.2015);
- Patent No. LV 14882 A “Production method for potato chips with a reduced fat content”. (20.07.2014);
- Patent LV 14631 A “Method of cranberry drying”. (20.02.2013).

Engagement of academic staff members, who are involved in the study process, in the research activity is important and their contribution to science is crucial.

The academic staff involved in the study courses, in addition to academic work, are actively involved in science. In their study courses, lectures and laboratory works are supplemented with the latest research in their field. During the studies master students are introduced to current events in the field and publication materials.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

All lecturers involved in the Master programme “Food Hygiene” are employees of LLU from Faculties of Veterinary Medicine, Food Technology and Engineering. Courses included in the programme are elaborated according to Regulation of LLU Studies Centre and Order No. 2.4-5/44 issued by the Vice-rector for Studies.

Courses are reviewed in sittings of institutes or departments and approved in the sitting of the Board of Faculty. If the course intends to introduce major changes, they are reviewed in the Methodological Teaching Commission.

Courses included in the programme are created with an idea that they contribute to each other and do not repeat. Academic staff members of each Faculty discuss and agree on presentation and delivery of the course subject.

Academic staff members cooperate in projects among institutes, departments or Faculties.

In the academic year of 2020/2021, student-staff ratio was not calculated for the programme, because the necessary amount of potential MA students did not apply until the beginning of studies.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	6_pielik_Statistikas_dati_Statistical_data_Partik_hig_prec.pdf	6_pielik_Statistikas_dati_Statistical_data_Partik_hig_prec.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	Annex_2_Compliance_with_State-ed-standard_EN_prec.pdf	2_pielik_Atibilstiba_valsts_standartam_lv_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	5_pielikums_studiju_kursu_karteejums_mapping_Partikas-hig.xls	5_pielikums_studiju_kursu_karteejums_Partikas-hig.xls
Curriculum of the study programme (for each type and form of the implementation of the study programme)	1_pielik_Studiju_plans_Study-plan_PH_mag_prec.xls	1_pielik_Studiju_plans_Study-plan_PH_mag_prec.xls
Descriptions of the study courses/ modules	4_pielik_Study_courses_Part-hig_EN.rar	4_pielik_Studiju_kursi_Part-hig_LV.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploma-and-dipl-supplem_Partikas-hig_en.rar	Diploms-un-pielikumi_Partikas-hig_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.		
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education		
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.		

Sustainable forestry (43623)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Sustainable forestry</i>
Education classification code	<i>43623</i>
Type of the study programme	<i>Academic bachelor study programme</i>
Name of the study programme director	<i>Edgars</i>
Surname of the study programme director	<i>Dubrovskis</i>
E-mail of the study programme director	<i>edgars.dubrovskis@llu.lv</i>
Title of the study programme director	<i>Mg. silv.</i>
Phone of the study programme director	
Goal of the study programme	<i>To prepare qualified, theoretically and practically educated forest discipline specialists for work in different public administration institutions and also companies and institutions operating in field of the forestry</i>
Tasks of the study programme	<i>To promote use of theoretical knowledge, cognition and skills of students for solving forestry-related problems, a well-through and reasonable management of natural resources.</i>
Results of the study programme	<ul style="list-style-type: none"> • <i>Knows the forest and related industries, their terminology, as well as the stages of forest management.</i> • <i>Knows about solutions in forest management, including cross-sectoral, as well as about the possibilities and technologies of further wood processing.</i> • <i>Knows about research design and development.</i> • <i>Is able to use theoretical knowledge in practice, find and analyze different information depending on the circumstances.</i> • <i>Is able to argue with the public and specialists in the field, as well as to solve problem situations independently.</i> • <i>Is able to independently analyze problem situations, integrating knowledge from different fields, as well as reasonably arguing their decisions.</i>
Final examination upon the completion of the study programme	<i>Bachelor Thesis</i>

Study programme forms

Full time studies - 3 years - english

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>english</i>
Amount (CP)	<i>120</i>
Admission requirements (in English)	<i>General secondary education or vocational secondary education. Test in biology. At least B2 level of English language skills</i>

Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Bachelor of Agricultural Sciences in Forestry</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

License No. 04056-92 for programme “Sustainable Forestry” was received on 25 February 2020 on the basis of the resolution No. 2020/06-1 adopted in the sitting of the Study Quality Commission.

There have been no changes in the parameters of the study program since receiving the license.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

During recent years LLU has been intensively working at attracting foreign students. The programme “Sustainable Forestry” was licensed in February 2020, and until enrolment period 3 potential students were interested in studying in this programme: one student from University of Sustainable Development Eberswald (Germany), who wanted to finalise her studies in forest management programme, one student from India and one from the Czech Republic, starting his studies with semester 1. Due to various factors, including restrictions of COVID-19 pandemic, did not apply for studies of year 2020/2021.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

EU and global trends in the forest science discipline calls for internationalisation and strategically concerted conduct to solve various interdisciplinary problems, involving representatives from various countries and continents to improve transfer of knowledge from academic and research environment to production. The Bachelor programme “Sustainable Forestry” was created due to previously mentioned trends and internationalisation activities of LLU, which would help to attract foreign students, therefore name of the study programme was coined according to global trends to introduce the notion and activities of sustainability.

Content of the programme corresponds to the national academic education standard (Annex 1).

After graduating from the Bachelor programme “Sustainable Forestry” a student is granted with a

degree Bachelor Degree of Agricultural Sciences in Forestry (Annex 2), which corresponds to the division of science branches and sub-branches in Latvia (<https://likumi.lv/ta/id/296661-noteikumi-par-latvijas-zinatnes-nozarem-un-apaksnozarem>, only in Latvian), reflecting a well-thought decision regarding the future qualification of the student.

Learning outcomes to be achieved show consistency and delivery of study programme's name, task and goal, developing a future specialist, who can analyse various information available in relation to forest and similar disciplines, problems and is capable of reasonable evaluation. Thus, students and alumni of LLU programme "Sustainable Forestry", by broadening their horizon of processes and global trends of forestry, will be competent specialists in forestry and related disciplines.

In relation to good quality study process it is necessary to correctly assess student's preparedness and knowledge level in advance, therefore we have student enrolment procedure for foreign students, which can be found in English version of LLU website (<https://www.llu.lv/en/how-to-apply>). When enrolling a student in a program implemented in English, copies of documents certifying previous education, as well as knowledge of English (IELTS, TOEFL, etc.) are required, if English is not the mother tongue. It applies also to future students in the study programme "Sustainable Forestry", including taking an entrance examination in Biology in the form of a test to verify the prospective student's knowledge, skills and competences related to the organization of living matter at the molecular, cell, tissue, organ, organism and cluster level so that he or she can learn successfully and build on previous knowledge, skills and competences according to previously mentioned goals, tasks and results of the programme. The need for an entrance examination in the study program "Sustainable Forestry" has been reviewed by the Senate of the Latvia University of Agriculture, and will be coordinated with the Council of Higher Education, in accordance with Section 46, Paragraph 4 of the Law of Higher Education Institutions.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Latvia's forest management is based on European and world forest management guidelines, the latest scientific innovations, and practice, with additional specialization in the Northern European region, which also includes Latvia. The content of the study program is developed for the world, including Europe and Northern Europe labor market. The courses has been updated in the end of 2019 and beginning of 2020, before licensing of the programme, when specialists from various forestry companies in Latvia and also foreign experts participated in creation and improvement of the courses. During the licensing process, the experts pointed at shortcomings in course descriptions, and they have been taken into consideration and implemented before accreditation in the updated study course descriptions according to Article 56.1 of the Law on Higher Education

Institutions (<https://likumi.lv/ta/id/37967-augstskolu-likums>, only in Latvian). Learning materials for study courses have been elaborated within the framework of Project 8.2.1.0/18/A/007 (consolidation of LLU study programmes and elaboration of new programmes) and they are available in e-studies system of LLU. According to LLU development strategy, course programme (Annex 3), its compliance with the needs of the branch, labour market and science trends is examined annually by recording the necessary changes in study plans and implementation process, qualitative and quantitative results of scientific and study methodology are gathered and published in annual reports on study disciplines found in LLU website. Industry specialists from the leading forest management companies, for example AS Latvian State Forests, supervising institutions, such as State Forest service, as well as leading forest research institute in Latvia LVMI "SILAVA" etc. are invited to review course content also in other programmes of the Forest Faculty.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

The study programme's plan (Annex 4) was created in accordance with principle of succession and logic sequence, taking into account the prerequisite knowledge needed for students to acquire each of the courses in question. Successful acquisition of the basic courses (Latvian Language, Applied Physics and Chemistry, Forest and Utilisation: Introduction, Plant Physiology, Soils and Forest Productivity and other courses), a student can master specialised, industry-based courses.

Course programmes were also created in parallel to elaboration of the course mapping (Annex 5), which shows success of achieving the learning outcomes of the programme in relation to knowledge, skills and competences included in the course programmes. It can be seen from information of all the courses in the study programme that the content of study courses correspond to the programme's goal and attainable results.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

The studies have a form of contact lessons and they are organised and supervised also as individual studies. Scope and requirements of delivery of each course are defined in the programme.

For the studies to be evaluated as successful, a student must master courses specified in the study programme's plan each semester. Delivery and supervision of the programme has been created in a form that is understandable for a student, making delivery transparent and assessment regular thus promoting achievement of the learning outcomes. E-studies are available for acquisition of

courses, and this media contains study materials, tasks, tests and serves as a communication platform between the student and academic staff members.

All course programmes include information about test types, class sessions, description of individual studies and works, to successfully acquire knowledge, skills and competences specified in the programmes, as well as to pass the course successfully. Consequently, assessment criteria of the study course or its part and information about the final grade / assessment is also included there. The delivery and supervision of the programme corresponds to the Section 552 of the Law on Higher Education Institutions, and the resolution of Council Of Higher Education certifies that (added to the attachment).

Proportion of theoretical and practical classes in large part of the courses varies around 50%. Given proportion changes depending on the functionality of the scientific discipline of a particular course and its role in delivery of the ultimate goal and proposed tasks of the programme. Proportion of practical classes increases in courses related to actual production and possible responsibilities in future jobs.

Course papers and several theoretical courses have independent works and homework, where a student must solve problems related to forestry and other disciplines, even interdisciplinary problems integrated in the exercises and situations of various complexity, allowing the student to go deeper into the problems either independently or in a group, to describe it by linking to knowledge, skills and competences acquired in the studies, as well as for the academic staff to assess the work of individual student of group of students - their ability to characterise the identified problems in qualitative and quantitative terms, to advise the best solution and possible course of development in future.

For delivery of several courses (for example, Forest Product Market, Forest Policy and Economics, Silviculture, Multifunctional Forest Management Planning etc.) forestry and other industry representatives will be invited as the scope of their practical skills and knowledge is much wider, thus they will broaden the knowledge horizon of the students due to latest and also global trends in forestry and related industries at the level of certain company, country, region.

All courses are student-centred:

- results of the course are clearly defined and students are aware of them; if necessary, academic staff members work individually to help attaining the learning outcomes - recommend additional literature, organise individual consultations;
- The students know and understand the defined study results (both those of the programme and the course);
- assessment of learning outcomes is designed to allow checking whether and at what level the learning outcomes are attained.
- The study process focuses on a student who can study independently.
- one can understand how the set of individual courses lead to outcomes of the programme;
- an academic staff member must promote the education process to allow student attaining the learning outcomes;
- at the end of the course the students provide their evaluation of the course mastered.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the

fulfilment of the tasks set for students during the traineeship.

The study programme does not include traineeship, however almost in each course the theoretical knowledge of students is enriched with practical sessions or seminars, mainly taking place outside LLU premises – in various forest, bog and meadow ecosystems, companies of the industry etc., acquiring knowledge, skills and competences in relation to sustainable forestry principles, extending awareness of the students about various processes and specialisation in forestry sector.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

Since there are no students in this programme, it is not possible to analyse or evaluate topics of the students' bachelor theses.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

Surveys of students, alumni and employers have not been made, because the programme does not have any students.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

There is no student mobility, because the programme does not have any students.

Through the International Cooperation Center, which implements the European Commission's higher education exchange programs, students have the opportunity to go on study mobility within the framework of bilateral agreements from LLU, as well for students from LLU partner universities and also teaching staff. Detailed information on mobility, as well as a list of partner universities, broken down by fields of study, study levels and types of mobility, is available at <https://www.llu.lv/en/erasmus> .

International mobility promotes the expansion of the LLU international cooperation network, ensures the recognition of the university and students and lecturers with the necessary exchange of experience.

Recognition of study results obtained at an Erasmus+ student's foreign university and transfer of

credit points is performed by the director of the study program in accordance with the LLU Rector's order No. 4.3. - 8/78 (02.11.2016) "On the procedure of academic recognition at LLU" (internal document).

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

Six faculties in a capacity of the basic structures are involved in delivery of the Bachelor programme: Forest Faculty (Silviculture Department, Forest Management Department, Woodworking Department), Faculty of Information Technologies (Physics Department, Management Systems Department); Faculty of Agriculture (Institute of Soil and Plants Science), Faculty of Food Technology (Chemistry Department), Faculty of Environment and Civil Engineering (Environment and Water Management Department), Faculty of Economics and Social Development (Institute of Business and Administration) and LLU Language Centre. Large part of compulsory and restricted elective courses is delivered by the university lecturers from the Forest Faculty, while some courses – in previously mentioned structural units of LLU. Structural units involved in the programme are provided with the necessary study base, which is being constantly improved and developed. Steps are taken to modernise premises and equipment on a regular basis, to prepare methodological materials, qualification upgrade of assisting staff.

Since LLU Forest Faculty implements several programmes, acquisition of special courses is organised by three Departments: Forest Management Department (MIZM), Woodworking Department (KOKA) and Silviculture Department (MEZK). The Faculty and said Departments have created a modern, suitable fundamental informative and material basis for delivery of the new study programme. After the support in the study process, students can turn to the director of the study program, lecturers and dean's office clerks, but for organizational issues to the Student Self-Government, International Cooperation Center staff, as well as other specialists to solve unclear issues, talk, recommend. Practical sessions and seminars outside LLU mainly are supported by the National Silviculture Institute of Latvia "Silava" and National Scientific Research Forest Management Agency "Forest Research Station" working under the auspices of Latvia University of Agriculture.

LLU Fundamental Library offers its visitors (in Latvian and also in English) various online databases (for example, CAB Abstracts; CRC Press e-books; EBSCO databases; EBSCO eBook Academic Collection; ScienceDirect journals; Scopus; Web of Science etc.) and databases in other media. The library has purchased a search software [PRIMO DISCOVERY](#), enabling simultaneous search in the subscribed and free online databases, electronic Union Catalogue of national-level libraries, LLU FB databases (publications of LLU academic staff members, LLU Master Theses etc.). When registering with LLU IS user account, one can view his or her user account and extend loan issuing deadlines,

subscribe for the published materials, access full texts in the subscribed online databases, save search results. "Information Search Assistant PRIMO" is available in the Library's website. Access to online databases is provided 24/7 in the LLU network, as well as for authorised users outside LLU network through EZproxy and LLU IS user account.

The most recent literature in the speciality written by local authors, academic staff members and foreign authors is available in LLU Fundamental Library and also Information Centre in the Forest Faculty (Room No. 27) during the studies where the students can access methodological materials for acquiring the course and also volumes of international scientific conferences and scientific journals also in English. Students can use computers situated in the Information Centre of the Forest Faculty to find needed information, read scientific publications, access electronic databases of scientific articles.

The most recent literature in Latvian and English is available also in the Silviculture Department, Forest Utilization Department and Woodworking Department.

E-studies must be used in studies to place learning and auxiliary materials, gather and evaluate attendance of contact lessons, assessment of tests and final exams, as well as to engage in interactive communication and present new courses. The E-studies environment is available in Latvian and English, and every semester / year the functionality is supplemented to improve the possibilities to implement high-quality and full-fledged studies.

During recent years by using EU co-funding, the existing laboratories (Laboratory for determining work environment, Wood Science laboratory, Hunting laboratory) is supplemented with modern equipment as well as a new laboratory has been created - Precise Forestry Laboratory, scientific laboratory of LLU Woodworking Department (equipment for determining physical-mechanical properties, determining physical-chemical properties, determining of material surface properties and for previous preparation of materials) at 41 Street Dobeles. It lays a basis for offering new specialisation directions in the Master programme.

Multimedia projectors and classrooms with wireless internet connection are used in the course teaching, allowing to project relevant information in lectures and practical classes on the screen and using internet resources where necessary. Two computer classes (with 50 workplaces) are available for students in the Faculty, where the computers have special forest management planning computer software installed and also software for data processing and designing. Students can use four computers located in the Information Centre of the Faculty for elaboration of their individual study papers.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over

the reporting period and their impact on the study quality.

During the period from the licensing of the program to the submission of the accreditation report, the composition of the teaching staff has not changed.

In order to ensure the quality of the study process, the English language skills of the teaching staff (Annex 7) have been assessed according to the EUROPASS methodology, so that the qualification of the teaching staff also complies with the requirements of Section 55³ of the Law on Higher Education Institutions (Annex 8).

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Academic staff members involved in delivery of programme “Sustainable Forestry”, both from the Forest Faculty and other structural units of LLU, have proven to be knowledgeable and competent professionals each in the course they deliver lectures on. Large part of the involved academic staff members is delivering lectures in English in courses for international students of the Faculty of Veterinary Medicine in programme “Veterinary Medicine”, participates in NOVA/BOVA intensive courses as well as ERASMUS+ exchange programme in delivering lectures.

Academic teaching staff involved in delivery of study programme “Sustainable Forestry” has proper qualifications determined by the Law on Higher Education Institutions – “not less than five professors and associated professors, who are elected in academic positions in relevant university, are involved in compulsory part and restricted elective courses of the academic programme”(<https://likumi.lv/doc.php?id=37967>, only in Latvian).

32 lecturers are involved in the implementation of the study program, of which 6 are professors, 4 associate professors, 9 assistant professors (of which 14 lecturers are also elected as leading researchers) and 12 lecturers, 5 of whom are also elected as researchers.

From the academic staff members involved in the programme delivery, for 63% of LLU academic staff members it is a primary work, and 81% of them hold a doctoral degree, while the remaining 37% are the visiting lecturers with 23% of them holding a doctoral degree.

The high scientific contribution of the teaching staff - the existence of a doctoral degree, participation in research of various levels and scope, including international and inter-institutional, gives students the opportunity to supplement students' theoretical knowledge with current issues in the field, the latest and most important research, results and problems.

Qualification upgrades of the academic staff members are done each year in several ways:

- number of academic staff members holding a doctoral degree, proving their knowledge, skills and competences in certain branch/sub-branch, which mainly corresponds to the discipline of

study course of the university lecturers increase;

- professional qualification upgrade courses / seminars / conferences are organised and attended each year (Science-based forest discipline, 2021, LLU Academic conference etc.);
- internship in companies of the sector takes place;
- special pedagogical competence upgrade training courses are attended.

Implementation of regular qualification upgrade measures and participation in them help following the latest findings in related sectors and recommendations for practical production, which serve as the basis for regular improvement of courses, so that the knowledge, skills and competences obtained in study process correspond to the actual situation in real production circumstances.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

The academic staff is involved in the scientific research due to research programmes created by LLU, for example, programme "Strengthening of Scientific Capacity in LLU" where academic staff members and doctoral students can compete for research funding. Each year applications are submitted for projects financed by the state, EU structural funds, National research programmes, in cooperation with the academic staff members and researchers from several LLU faculties as well in cooperation with LVMI SILAVA, AS LVM and other forestry companies in Latvia, and also for transfer of theoretical knowledge in the production processes.

Researchers from various countries co-author in joint international publications, promoting also wider recognisability of LLU staff in the world and extra opportunities to engage in international projects.

When engaging in active scientific activity, the academic staff members may transfer and implement the new knowledge, skills and competences in the study courses they lecture on, thus enhancing study efficiency and giving the real-world dimension to the programmes.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

Field of forestry is very varied in terms of its subject and actually related to many other scientific disciplines, often even overlapping with them in some aspects (for example, agriculture, environment engineering etc.), therefore different academic staff members from various LLU faculties or institutions are involved in the programme and courses. They have good knowledge of the issues under question and they can broaden the horizon of knowledge and competences to be acquired in the programme where it touches other scientific disciplines, and they also can foster a healthy competition and cooperation potential among academic staff members and researchers from various faculties. This cooperation is described in Section 4.5 of present report.

Mutual cooperation is enhanced by convening wider or narrower meetings and working groups at a certain regularity (at least once a year) to discuss, for example, the adequacy of certain study courses, knowledge, skills and competencies to achieve the study program goals and results, the use of various didactic techniques. in the study process, their improvement, as well as solving various problems that affect the work with students.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	Annex_9_Student_statistics_Sustainable_forestry.pdf	9_pielikums_Studentu_statistikas_dati_llgspējiga_mezsaimnieciba.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	Annex_1_Compliance of the study progr_Sust_forestry_ with the State Education Standard_prec.pdf	1_pielikums_Studiju_progr_llgstp_mezsaimn_atbilstiba_VIS_prec.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	Annex_5_Study course mapping of study program Sustainable forestry.xlsx	5_pielikums_Studiju_kursu_kartejums_studijprogrammai_llgspējiga_mezsaimnieciba.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	Annex_4_Study plan of study program Sustainable forestry_prec.pdf	4_pielikums_Studiju_progr_llgspējiga_mezsaimn_Studiju_plans_prec.pdf
Descriptions of the study courses/ modules	Annex_3_Study-courses_Sustainable forestry_prec.rar	3_pielikums_Studiju-kursu-apraksti_llgsts_mezsaimniec_prec.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	Diploms-un-pielikums_llgstp-mez_en.rar	Diploms-un-pielikums_llgstp-mez_lv.rar
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_VMU_sadarbibas_ligums.pdf	LLU_VMU_sadarbibas_ligums.pdf
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_aplicinajums_Lauksaimniecibas_mezsaimniecibas_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_ligums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	bak_stud_progr_llgspējiga_mezsaimnieciba_AIP_atzinums_EN.docx	bak_stud_progr_llgspējiga_mezsaimnieciba_AIP_atzinums.pdf

Sustainable Agriculture (43621)

Study field	<i>Agriculture, Forestry, Fishery, and Food Hygiene</i>
ProcedureStudyProgram.Name	<i>Sustainable Agriculture</i>
Education classification code	<i>43621</i>
Type of the study programme	<i>Academic bachelor study programme</i>
Name of the study programme director	<i>Gunita</i>
Surname of the study programme director	<i>Bimšteine</i>
E-mail of the study programme director	<i>gunita.bimsteine@llu.lv</i>
Title of the study programme director	<i>Dr. agr.</i>
Phone of the study programme director	
Goal of the study programme	<p><i>For agricultural specialists with versatile academic background, who are able to:</i></p> <ul style="list-style-type: none"> <i>• Evaluate the role of a sustainable agricultural production and its harmony with environment;</i> <i>• Use information technologies and modern science insights for improvement of production technologies in the industry;</i> <i>• Continue studies in Master programme.</i>
Tasks of the study programme	<i>To provide theoretical knowledge and some practical direction for the students of this programme so that the alumni are able to successfully work in agriculture-related companies.</i>
Results of the study programme	<p><i>Students acquire knowledge of plant and animal biology, plant and animal production technologies and production quality, environment and agricultural production interaction, economic and ethical aspects of production, as well as knowledge about methods applied in scientific research of agriculture.</i></p> <p><i>The students know how to choose crops and farm animal breeding technologies according to circumstances and activity context. They know how to evaluate production results referring to the scientific literature and special information sources for explanation, planning and improvement of agricultural processes. They are able to plan research, collect and analyse research results.</i></p> <p><i>They are competent to organise, evaluate and analyse the processes in sustainable plant or animal production, make decisions about technology and/or method most suitable in given situation, conduct research and also continue academic education in the Master studies.</i></p>
Final examination upon the completion of the study programme	<i>Bachelor Thesis</i>

Study programme forms

Full time studies - 3 years - english

Study type and form	<i>Full time studies</i>
Duration in full years	<i>3</i>
Duration in month	<i>0</i>
Language	<i>english</i>
Amount (CP)	<i>120</i>

Admission requirements (in English)	<i>General secondary education or vocational secondary education. Test in biology. At least B2 level of English language skills</i>
Degree to be acquired or professional qualification, or degree to be acquired and professional qualification (in english)	<i>Bachelor's degree in agricultural sciences</i>
Qualification to be obtained (in english)	-

Places of implementation

Place name	City	Address
Latvia University of Life Sciences and Technologies	JELGAVA	LIELĀ IEĻA 2, JELGAVA, LV-3001

III - DESCRIPTION OF THE STUDY PROGRAMME (1. Indicators Describing the Study Programme)

1.1. Description and analysis of changes in study programme parameters that have taken place since the issue of the previous accreditation certificate of study direction or the license of study programme if study programme is not included in the accreditation page of the study direction

License No. 04056-93 for programme “Sustainable Agriculture” was received on 25 February 2020 referring to the resolution No. 2020/07-L adopted in the meeting of the Study Quality Commission.

Specialisation directions for the Bachelor programme “Sustainable Agriculture” – Sustainable Plant Production and Sustainable Animal Production.

There have been no changes in the parameters of the study program since receiving the license.

1.2. Analysis and assessment of the statistical data on the students of the respective study programme, the dynamics of the number of the students, and the factors affecting the changes to the number of the students. The analysis shall be broken down in the different study forms, types, and languages.

Admission of students to the programme “Sustainable Agriculture” has been declared as of the academic year of 2020/2021. One student from Nepal was interested in studies. A study agreement was prepared and schedule for semester 1 sessions was made, however, due to situation in Latvia and Nepal with COVID-19, the student had to return to his homeland.

A study agreement was prepared also for a Vietnamese student however it was not possible to travel from third countries due to COVID-19. As the situation improves, the students plan to arrive for studies in the academic year of 2021/2022.

There were also negotiations with a student from Germany wishing to continue studies in the programme “Sustainable Agriculture” – in semester 4.

Information about the study programme “Sustainable Agriculture” is available for potential foreign students in LLU portal: <https://www.llu.lv/en/sustainable-agriculture>.

The programme has been advertised also in several international exhibitions where LLU International Cooperation Centre participated, in the education fair Education and Career in Uzbekistan (Tashkent and Samarkand) organised by Expocontact, and in the international education fair Begin Edu Fair in St. Peterburg.

1.3. Analysis and assessment of the interrelation between the name of the study programme, the degree or professional qualification to be acquired or the degree and professional qualification to be acquired, the aims, objectives, learning outcomes, and the admission requirements.

Mutual relations among the name of the programme, degree to be conferred, goals and tasks of the programme as well as admission requirements have been evaluated in great detail when this study programme was created. The programme was created within the framework of the ESF Project “Consolidation of LLU Programmes and Development of New programmes” No.8.2.1.0/18/A007.

Elaboration of the Bachelor programme “Sustainable Agriculture” was started with elaboration of a substantiation on 19 March 2018 in the LF Methodical Commission meeting, confirmation of the study plan on 21 May 2019 and confirmation of the programme on LF Council meeting on 17 September 2019.

The attainable study results indicated in the Bachelor's study program “Sustainable Agriculture” reflect the objective of the program and the tasks. In turn, both the objective and the tasks are closely related to the name of the program. The aim of the study program is to prepare academically comprehensively educated agricultural specialists who are able to assess the importance of sustainable agricultural production and its unity with the environment, using modern scientific findings. Admission requirements are developed in accordance with the objective of the study program.

III - DESCRIPTION OF THE STUDY PROGRAMME (2. The Content of Studies and Implementation Thereof)

2.1. Assessment of the relevance of the content of the study course/ module and the compliance with the needs of the relevant industry and labour market and with the trends in science. Provide information on how and whether the content of the study course/ module is updated in line with the development trends of the relevant industry, labour market, and science. In case of master's and doctoral study programmes, specify and provide the justification as to whether the degrees are awarded in view of the developments and findings in the field of science or artistic creation.

Bachelor programme “Sustainable Agriculture” in English will promote development of international study and research environment in LLU. The programme corresponds to the study direction “Agriculture, Forestry, Fishery, Veterinary Medicine and Food Hygiene”. The main target audience is international students however it will be available also to Latvian youth wishing to study in English.

Increased public interest in the principles of sustainable development, both in agricultural production and in other areas in many countries around the world, indicates the need to increasingly include aspects of environmental protection and balanced production in study programs. The content of the study program “Sustainable Agriculture” is based on the principles of sustainable development in the production of plant and animal products.

The main long-term goals of LLU activity are **research excellence**, which promotes technologies and innovations and is integrated in the study process, **high quality studies**, which allow preparing internationally competitive specialists, and **efficient university administration**, which supports purposeful and useful use of resources to deliver high quality studies and excellence-oriented research (<https://www.llu.lv/index.php/en/mission-and-vision>). According to LLU Strategy,

the research in LLU is implemented in three main directions: biosciences, engineering sciences and social sciences. The new Bachelor programme completely qualifies for the bioscience discipline. This is also in line with the European Union's common position and move towards a Green Deal

In context of internationalization of education, LLU surveys and evaluates the demand - interests and needs of foreign students, prepares and promotes in international environment an offer satisfying this demand. The program has been presented in several countries - Uzbekistan, Georgia, Kazakhstan and Russia (St. Petersburg). Relatively high interest is also shown from Nepal and Pakistan. The potential labor market for graduates could be European or global research institutes related to agricultural or environmental science, as well as public administration institutions.

2.2. Assessment of the interrelation between the information included in the study courses/ modules, the intended learning outcomes, the set aims and other indicators, the relation between the aims of the study course/ module and the aims and intended outcomes of the study programme. In case of a doctoral study programme, provide a description of the main research roadmaps and the impact of the study programme on research and other education levels.

Development of programme "Sustainable Agriculture" is built on the agricultural science, and specialisation directions of the Bachelor study correspond and continue the existing science directions of LF: **sustainable plant production** qualifies for plant science, and **sustainable animal production** qualifies for the animal science direction. Content of the study programme has been created in line with the content of Agriculture science branch and needs and specifics of agriculture as the production industry not only in Latvia, but also the European Union.

The strategic goal of the study programme is to provide students the access to theoretical knowledge and research skills of the corresponding sciences (plant or animal science), results stated in the programme, which correspond to the knowledge, skills and competence of the European Qualification Framework for Level 6, stated in the Latvian Qualification Framework.

The elaborated course programmes correspond to the programme's goal, tasks and defined study results.

Coherence and compliance of the course is clearly shown by the course mapping, which is specified in Annex 2 on the mapping of study courses according to licensing experts' recommendations.

According to recommendations of licensing experts all course plans are reviewed, providing a more detailed explanation about evaluation criteria of the learning outcomes and specifying the work spent in independent work.

2.3. Assessment of the study implementation methods (including the evaluation methods) by providing the analysis of how the study implementation methods (including the evaluation methods) used in the study courses/ modules are selected, what they are, and how they contribute to the achievement of the learning outcomes of the study courses and the aims of the study programme. Provide an explanation of how the student-centred principles are taken into account in the implementation of the study process.

The study process is created in line with the student-centred education guidelines (http://www.aic.lv/portal/content/files/Informativs_zinojums_SCL_istenosana_Latvija.pdf (Latvian only) and <https://www.enqa.eu/wp-content/uploads/ESG-2015-ENQA-Thematic-Analysis-final.pdf>). These standard guidelines require that student-centred learning and teaching play a crucial role in student motivation, contemplation and involvement in learning process. It means a careful and considerate creation and delivery of the programmes and assessment of results.

The study plan ensures acquisition of mutually subordinated courses where the basis for acquiring every course is information provided in previous courses. This course planning contributes to successive mastering of knowledge. The basis of organisation of the study process in LLU is centralised planning of lectures, laboratory and practical tasks.

Each course that is included in the study plan has its programme elaborated and approved by the institute and the Faculty Council, which includes information about the volume of lectures, practical works, seminars and laboratory works, provides course abstract, attainable learning outcomes, detailed description of course content and literature for acquiring the course, as well as describes the requirements for getting credit points.

Students present results of the group or individual work in seminars and practical classes. For laboratory works there are methodological instructions for performance in place.

The Faculty widely uses Moodle environment for placing the study materials, mutual communication of course attendees and examination types. Teaching staff often communicates with students electronically and ask students to submit their papers electronically at first. It improves the quality of students' works and saves material resources.

The following principles are followed in acquiring learning outcomes:

- fair assessment of knowledge and skills — there is a set of requirements for positive assessment of learning outcomes;
- compulsory assessment principle - one needs to acquire positive assessment of compulsory programme's content.

Basic forms of programme's assessment are formal test, Pass/Fail assessment and examination. Knowledge is evaluated in ten grade scale according to criteria approved in LLU Senate.

Students are motivated for timely studies and achievement of better results during the semester through a regular supervision of theory mastering and performance of independent work. Consultations with academic staff members are available both during and outside the class sessions.

Teaching materials in English, for more than 20 different courses, have been prepared within the framework of the European Regional Development Fund's project "Consolidation of LLU programmes and elaboration of new programmes" No.8.2.1.0/18/A/007, in the study programme "Sustainable Agriculture". Study course materials are placed in e-studies. Some of course materials prepared, for example, for the course Plant Pathology (4 CP) were approbated and used for Erasmus+ programme in the academic year of 2020/2021.

2.4. If the study programme entails a traineeship, provide the analysis and assessment of the relation between the tasks of the traineeship included in the study programme and the learning outcomes of the study programme. Specify how the higher education institution/ college supports the students within the study programme regarding the

fulfilment of the tasks set for students during the traineeship.

The study programme “Sustainable Agriculture” includes traineeships that are focusing solely on strengthening the theoretical knowledge. They are organised according to traineeship regulation approved in the LLU Senate (see Annex "Traineeship Regulation").

LLU and LF learning and research farms LF MPS “Pēterlauki” and SIA “LLU MPS Vecauce” are the main spots of traineeship, having a vast range of crops, herd of genetic resources and producing milk cows, and a possibility to learn about modern technologies applied there.

LF has entered in cooperation agreements with LPKS LATRAPs “On bilateral cooperation aimed at experience and knowledge-sharing, promoting intellectual and professional development among LLU students, support various activities of the faculty, cooperate in research issues, provide consultations” (Agreement No.3.2.-10/TPK-49). Similar cooperation agreements have been signed with SIA Scandagra and OÜ E-Agronom, AS “Balticovo” and AS “Putnu fabrika Ķekava”.

LF has a long-standing and efficient collaboration with LLU APP “Dārzkopības institūts”, LLU APP “Agroresursu un ekonomikas institūts” and institutes of LLU: Scientific Plant Protection Institute of Latvia “Agrihorts” and Scientific Farming Institute in Skrīveri.

There is a wide list of farms using innovative technologies, where the cooperation has taken place for several years.

2.5. Analysis and assessment of the topics of the final theses of the students, their relevance in the respective field, including the labour market, and the evaluations of the final theses.

Students may choose any subject for the Bachelor Thesis at their own discretion. They may be prepared as individual research within the framework of scientific projects offered by the academic staff members, or it can be an extensive analysis/summary of available scientific literature on the chosen topic.

Following the recommendations of licensing experts, it is planned to include also industry representatives in the Bachelor Thesis Defence Commission.

2.6. Analysis and assessment of the outcomes of the surveys conducted among the students, graduates, and employers, and the use of these outcomes for the improvement of the content and quality of studies by providing the respective examples.

To date, there are no students in the programme “Sustainable Agriculture”.

When assessing the employers before the programme licensing the following positive aspects were noted: LLU's progress towards development of international study and research environment; programme's content has been created taking into account the content of the science of agriculture and needs of agriculture as the production industry and its specifics in Latvia and Europe;

cooperation with production companies, also in this English language programme, which in its turn would promote faster involvement of students into the labour market, or to continue studies in Master programme.

2.7. Provide the assessment of the options of the incoming and outgoing mobility of the students, the dynamics of the number of the used opportunities, and the recognition of the study courses acquired during the mobility.

To date, there are no students in the programme “Sustainable Agriculture”, therefore it is too early to analyse incoming and outgoing mobility. However, students will be offered all the opportunities within the Erasmus+ exchange program.

III - DESCRIPTION OF THE STUDY PROGRAMME (3. Resources and Provision of the Study Programme)

3.1. Assessment of the compliance of the resources and provision (study provision, scientific support (if applicable), informative provision (including libraries), material and technical provision, and financial provision) with the conditions for the implementation of the study programme and the learning outcomes to be achieved by providing the respective examples. Whilst carrying out the assessment, it is possible to refer to the information provided for in the criteria set forth in Part II, Chapter 3, sub-paragraphs 3.1 to 3.3.

All structural units of LLU Faculties are involved in delivery of study direction “Sustainable Agriculture” according to Senate's resolution No. 8.-14. of 08.05.2013 “On attraction of scientific branches and sub-branches (disciplines*) for confirmation of courses”, which contributes to quality of lectured courses, because they are taught by specialists of the industry (discipline).

The study courses included in the study program are attached to e-studies, in which all current and necessary study course materials for a specific semester are inserted. The e-studies adapted for users in English.

All students and academic staff have access to LLU Fundamental Library (FB), spacious reading-room and subscribed databases. Information about library services and information resources are provided on the website: <https://lufb.llu.lv/en>, containing information in Latvian and English.

The library has books (in english) for mastering the course, while in the reading-room has also scientific monographs and periodicals. Presence of a particular book in the library may be searched in electronic catalogue [Union Catalogue](#) (ALEPH 500) or [Electronic Catalogue of Fundamental Library of the LLU](#) (ALEPH 500), the information in the catalogs is also in English.

Online databases created in the Fundamental Library of LLU are also available: [Publications of the Academic and Research Staff of the LLU](#), [Theses Presented at the LLU](#), [Proceedings of conferences of the LLU](#) etc.

FB has subscribed for many international databases, giving access to students and academic staff to extensive scientific research results and also books published in other European countries or other parts of the world. E-book databases, for example – [Taylor & Francis Group CRC Press](#), [EBSCO eBook Academic Collection](#). E-journal databases – [EBSCOhost](#), [ScienceDirect journals](#), [Wiley Online Journals](#) etc.

Delivery of the newly created programme “Sustainable Agriculture” will allow more efficient use of the modernised and upgraded materially technical base of LLU studies and science and also the improved infrastructure, because the number of Latvian students is decreasing.

FL uses common classrooms in the main LLU building – the palace – where the schedule is planned centrally by LLU: 109; 123; 126; 127; 130; 134; 207, 206 (computer class), 209, 224, 227, 230 (computer class), 233 and structural unit at 1 Street Strazdu, as well study and scientific laboratories – Agrochemistry, Plant Biochemistry, Microbiology, Plant Physiology, Plant and Seed, Orchard Plant and Apiology, Plant Pathology and Entomology labs.

Classrooms were upgraded when implementing a part of ERAF-funded projects “Improvement of LLU teaching infrastructure” (2010 - 2015) and “Support to the institutional capacity and development of infrastructure of LLU and scientific institutions under its auspices” (2017-2021) as well as within the framework of the project financed by LR ZM and VARAM “Provision of energy efficiency of Jelgava Castle” (2016-2020).

Equipment and devices in the premises and laboratories used for course delivery and under responsibility of other LLU Faculties are suitable for each course and ensure qualitative achievement of efficient indicators set for the course.

LLU centralised scientific laboratories – Forest and Water Resources Scientific Lab and Biotechnologies Scientific Lab will also be involved in course delivery.

Specialised study courses widely use natural materials: plant herbarium, insect collections, soil, seed, fertiliser and forage production samples which are analysed and taught in specially designed and equipped laboratories mentioned above.

Financial basis of the programme is planned from the tuition fee revenue, when delivering the Bachelor studies in English to foreign students. Tuition fee for the academic year of 2020/2021 is set at 3,000 EUR per year. This tuition fee does not include social provision of study place, because students who pay for studies themselves do not receive scholarships.

Revenue-to-costs ratio approved by LLU Senate determine that 60% of funds from paid studies are spent for covering remuneration costs and 40% – for other costs, 20% of which are in direct control of the Faculty delivering the relevant study programme.

3.2. Assessment of the study provision and scientific support, including the resources provided within the cooperation with other science institutes and institutions of higher education (applicable to the doctoral study programmes).

III - DESCRIPTION OF THE STUDY PROGRAMME (4. Teaching Staff)

4.1. Analysis and assessment of the changes to the composition of the teaching staff over the reporting period and their impact on the study quality.

Academic staff members involved in delivery of programme “Sustainable Agriculture”, both from the Faculty of Agriculture and other Faculties of LLU, have proven to be knowledgeable and competent professionals in the course they lecturing on.

Part of the academic staff members are already delivering lectures in English in courses for international students of the Faculty of Veterinary Medicine in programme “Veterinary Medicine” as well as ERASMUS+ exchange programme. Academic staff members who do the research in relevant industries and are able to deliver courses in English have been chosen.

Following recommendations of experts, university lecturers of courses “Labour and Civil Protection” and “Theory of Economics” were changed.

4.2. Assessment of the compliance of the qualification of the teaching staff members (academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants) involved in the implementation of the study programme with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments. Provide information on how the qualification of the teaching staff members contributes to the achievement of the learning outcomes.

Academic staff members have proper qualifications determined by the Law on Higher Education Institutions – “not less than five professors and associated professors, who are elected in academic positions in relevant higher education institution, are engaged in delivery of compulsory section and restricted elective courses of the academic programme” (<https://likumi.lv/doc.php?id=37967>, Latvian only).

Academic staff of various level is engaged in delivery of the programme “Sustainable Agriculture”, and currently there are 32 university lecturers, with 31% of them being professors, 28% associated professors, 16% university lecturers and 3% assistants. It must be also noted that a part of this academic staff, namely 13%, are the leading researchers.

Within the framework of project No. 8.2.2 implemented by LLU, six academic staff members from those involved in the programme in 2020 improved their English proficiency. In 2021, other academic staff members continue doing it.

In order to motivate constant professional upgrade in the university didactics, LLU has created the professional upgrade programme for higher education teachers “Innovations in university teaching”. The programme corresponds to Clause 2¹ of **Article 5 of the Law on Institution of Higher Education**: *higher education institutions deliver their internal quality assurance systems, within the framework of which they (Clause 4): dictate intrinsic order and mechanisms to provide mechanisms for academic staff qualification and work quality*; Clause 5 of **Article 26 of the Law on Institution of Higher Education Higher Education Institution Staff, Rights and Obligations thereof**: The management of the higher education institution must take care of the working conditions of their staff, provide conditions for qualification upgrade and retraining

(<https://likumi.lv/ta/id/37967-augstskolu-likums>, Latvian only). Several academic staff members undergo training in this programme.

Academic staff participating in the European Social Fund project No.8.2.2.0/18/A/014 “Professional upgrade of LLU academic staff” working in the academic year of 2020 and 2021 participate in internship – companies related to agricultural production or provision of services vital for the industry. The new competences acquired during the internship provide an opportunity to supplement the content of course lectures and practical classes with newly acquired theoretical and practical knowledge as well as foster cooperation with industry representatives and allow understanding the needs of industry and requirements of alumni.

4.3. Information on the number of the scientific publications of the academic staff members, involved in the implementation of the doctoral study programme, as published during the reporting period by listing the most significant publications published in Scopus or WoS CC indexed journals. As for the social sciences, humanitarian sciences, and the science of art, the scientific publications published in ERIH+ indexed journals may be additionally specified (if applicable).

4.4. Information on the participation of the academic staff, involved in the implementation of the doctoral study programme, in scientific projects as project managers or prime contractors/ subproject managers/ leading researchers by specifying the name of the relevant project, as well as the source and the amount of the funding. Provide information on the reporting period (if applicable).

4.5. Provide examples of the involvement of the academic staff in the scientific research and/or artistic creation activities both at national and at international level (in the fields related to the content of the study programme), as well as the use of the obtained information in the study process.

Majority of the academic staff involved in the study programme “Sustainable Agriculture” participates in elaboration, implementation or management of various scientific projects (information is reflected in the CV of academic staff) academic staff working in the Faculty of Agriculture are engaged in:

- Delivery of international projects (3):
 - 7th Framework Programme Project “*Pyrenophora tritici-repentis* development specifics and restriction possibilities in winter whey fields in Latvia and Belarus” (2019-2021).
- ERA-NET Co-founding project “Climate Care Cattle Farming Systems (project ID: 39274; 2019-2022). Financed by the State of Latvia (14)
 - LZP scholarship “Pathogenicity and diversity of *botrytis spp.*, the most fundamental cause of leguminous plant diseases” (2-19-2022).

- LZP scholarship together with cooperation partners “Characterization of general and mastitis susceptibility genetic background for Latvia’s (indigenous) local breeds of ruminants” (2020-2022).
- Contractual research (16+4 (TEPEK)), for example, TEPV89 “Technically economic feasibility study on scientifically substantiated use of phytonutrients (NPK) and microbiological supplements in organic mineral fertilizers as introduction of a new product in biological farming”.

The findings gained during the implemented projects will be used for the development of specialization courses, such as Plant Pathology, Entomology, Fundamental of Soil Sciences, Biology and Production of field Crops, Animal Husbandry Technologies I-IV. Also, students of this study program will have the opportunity to get involved in the implementation of projects by developing their Bachelor's theses.

4.6. Assessment of the cooperation between the teaching staff members by specifying the mechanisms used to promote the cooperation and ensure the interrelation between the study courses/ modules. Specify also the proportion of the number of the students and the teaching staff within the study programme (at the moment of the submission of the Self-Assessment Report).

The study plan allows acquiring mutually subordinated courses where each acquired course adds the basis for acquiring a new one. This course planning contributes to successive mastering of knowledge.

Each course that is included in the study plan has its programme elaborated and approved by the institute and the Faculty Council, which includes information about the volume of lectures, practical works, seminars and laboratory works, provides course abstract, attainable learning outcomes, detailed description of course content and literature for acquiring the course, as well as describes the requirements for getting credit points.

During the discussion of the study course program, all academic staff included in the study program have the opportunity to make proposals on separate sections of the study course.

Study practices that take place in the 2nd and 4th semesters are led by lecturers of several study courses, who also mutually agree on the management of practices and evaluation criteria.

Academic staff who lead different study courses also participate in the implementation of scientific projects, while they use the acquired scientific knowledge separately in their own courses, thus promoting an interdisciplinary approach.

LF Methodical Commission and program director follow-up to prevent overlapping of the information provided in the courses. Mapping of both direction study courses has been created (see Annex "Mapping of study courses") and it reflects the attainable results of each course and programme in general.

It is difficult to indicate student-to-academic staff members' ratio and provide analysis, because there are no students right now in the program.

Annexes

III. Description of the Study Programme - 1. Indicators Describing the Study Programme		
Compliance of the joint study programme with the provisions of the Law on Institutions of Higher Education (table)		
Statistics on the students over the reporting period	Annex_1_Statistical data_Sustainable agriculture.pdf	1_pielik_Statistikas dati_Ilgtspējīga lauksaimniecība.pdf
III. Description of the Study Programme - 2. The Content of Studies and Implementation Thereof		
Compliance of the study programme with the State Education Standard	Annex_3_Compiance-with-State-Ed-Standard_Akad_BAK_Sust_Agr_EN.pdf	3_pielik_Akad_BAK_Sust_Agr_atbilstība VAS_Iv.pdf
Compliance of the qualification to be acquired upon completion of the study programme with the professional standard (if applicable)		
Compliance of the study programme with the specific regulatory framework applicable to the relevant field (if applicable)		
Mapping of the study courses/ modules for the achievement of the learning outcomes of the study programme	Annex_2_Sustainable Agriculture_mapping_EN.xlsx	2_pielik_Sustainable Agriculture_studiju_kursu_kartējums LV.xlsx
Curriculum of the study programme (for each type and form of the implementation of the study programme)	Annex_4_Programe_Sustainable Agriculture_study_plan_EN_prec.pdf	4_pielik_Programmas_Ilgtspējīga lauksaimniecība_studiju_plāns LV_prec.pdf
Descriptions of the study courses/ modules	Annex_5_Studiju kursi_EN_Sustainable agriculture.rar	5_pielik_Studiju kursi LV_Ilgtspējīga lauksaimniecība.rar
Description of the Study Direction - Other mandatory attachments		
Sample of the diploma to be issued for the acquisition of the study programme.	LF_Sus_Agric_diploms-diploma-diploma-pielik-diploma-suplement_LV-EN.pdf	LF_Sus_Agric_diploms-diploma-diploma-pielik-diploma-suplement_LV-EN.pdf
Description of the Study Programme - Other mandatory attachments		
Document confirming that the higher education institution/ college will provide the students with the options to continue the acquisition of education in another study programme or at another higher education institution/ college (a contract with another accredited higher education institution/ college), in case the implementation of the study programme is discontinued	LLU_VMU_sadarbības_līgums.pdf	LLU_VMU_sadarbības_līgums.pdf
Document confirming that the higher education institution/ college guarantees to the students a compensation for losses if the study programme is not accredited or the licence of the study programme is revoked due to the actions of the higher education institution/ college (actions or failure to act) and the student does not wish to continue the studies in another study programme	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_apliecinājums_Lauksaimniecības_mezsaimniecības_virzienam_precizets.edoc
Confirmation of the higher education institution/ college that the teaching staff members to be involved in the implementation of the study programme have at least B2-level knowledge of a related foreign language according to European language levels (see the levels under www.europass.lv), if the study programme or any part thereof is to be implemented in a foreign language.	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_apliecinājums_Lauksaimniecības_mezsaimniecības_virzienam_precizets.edoc
If the study programmes in the study direction subject to the assessment are doctoral study programmes, a confirmation that at least five teaching staff members with doctoral degree are among the academic staff of a doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field or sub-field of science, in which the study programme has intended to award a scientific degree.		
If academic study programmes are implemented within the study direction, a document confirming that the academic staff of the academic study programme complies with the provisions set out in Section 55, Paragraph one, Clause three of the Law on Institutions of Higher Education	LLU_confirms_Agriculture_Forestry_direction_EN_change.docx	LLU_apliecinājums_Lauksaimniecības_mezsaimniecības_virzienam_precizets.edoc
Sample (or samples) of the study agreement	Study_Agreement_LV_EN_2021.pdf	Studiju_līgums_2021.pdf
If academic study programmes for less than 250 full-time students are implemented within the study direction, the opinion of the Council for Higher Education shall be attached in compliance with Section 55, Paragraph two of the Law on Institutions of Higher Education.	bak_stud_prog_Ilgtspējīga lauksaimniecība_AIP_atzinums_EN.docx	bak_stud_prog_Ilgtspējīga lauksaimniecība_AIP_atzinums.pdf