

# Expert group joint opinion

Evaluation Procedure: Assessment of Study Field

Higher Education Institution: Latvia University of Life Sciences and Technologies

Study field: Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering

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# Summary Assessment of the Study Field

## Summary Assessment of the Study Field

The expert team finds the assessed study field "Mechanics and Metal Processing, Heat Power Engineering, Heat Technology, and Mechanical Engineering" (hereafter referred to as: Study Field) matching both the Latvia University of Life Sciences and Technologies (University) mission as well as needs of the local economy, hence it recommends it to be accredited. Nevertheless, there are a number of shortcomings needed to be addressed by the university management and program directors.

Firstly, the expert team finds it immensely important that both the existing and prospective cooperation agreements with the industry are better thought of and made a part of a well designed cooperation practice. Once signed, a cooperation must be beneficial to both partners and going beyond typical internship/employment provisions.

Furthermore, the motivation program for young professionals needs to be seriously considered in order to attract them as academic staff. Although it is very important to work with attracting foreign students, the University must not forget about local potential students.

It is mentioned more precisely in each of the study programs.

Finally, the demonstrated initiative to expand University's operations outside Latvia is found good and should be complimented for. However, in order to make it fruitful and sustainable, such an undertaking must be carefully planned and preceded by a number of feasibility and market potential analyses.

## 1. Management of the Study Field

### Analysis

The aims of the study field are clearly defined and complementary to the University's mission. The rationale behind the study field and the corresponding programmes is sound, purpose-driven and correlates with the needs of the national economy. According to sources such as the Official Statistics Portal of Latvia ([www.stat.gov.lv](http://www.stat.gov.lv)) and the Investment and Development Agency of Latvia ([www.liaa.gov.lv](http://www.liaa.gov.lv)), most important Latvian business sectors include agriculture, chemical industry, logistics, woodworking, machinery production and food processing, and their positive outputs are clearly visible from the industrial production indices in the last 5 years which are in a steady incline. In this regard, targeting these sectors and educating highly qualified engineering workforce is deemed both sound and timely.

In the self-evaluation report (hereafter referred to as: SER) the University claims graduated students to have been capacitated to take over industry-related responsibilities immediately upon graduation, substantiating this with a claim that students get relevant hands-on industry experience through their traineeships in their 3rd and 4th year of study. Even though it is beyond any doubt that the employability of the graduated students is high, still, this may not be entirely attributed to the quality of the study and the University itself, but may also be seen as a consequence of the corresponding EU-wide employment trends. Thus, for instance, as may be seen from the Eurostat Recovery Dashboard data (<https://ec.europa.eu/eurostat/cache/recovery-dashboard/>), apart from Covid-affected 2020, there has been a steady decline in the unemployment rate both in Latvia and European Union (EU) as a whole, proving higher demand for quality workforce. It may therefore be concluded that there is still room for further improvements to be made in providing better industry-

relevant practical experience to students, hence improving their long-term employability and 21st century economy relevance. This has been further backed up by the feedback gained from the interviewed students and graduates, some of which have expressed a rather direct criticism on how they would prefer "...to actually get a feel for a particular machine and see it in reality rather than seeing it working on youtube". Moreover, as further discussed in section 5, the relationship with the industry must be better managed in a sense that rights, responsibilities and liabilities must be addressed contractually thus leaving little room for improvisations, voluntarism and dependence on personal liaisons.

Even though the structure of the management is oriented towards the development of the study field, from the documentation made available and the feedbacks gained in the interviews held it may be deemed that some strategic development activities have not been properly thought off in addition to the rather poorly managed relationship with the industry partners. Thus, for instance, the University's management has repeatedly underlined internationalisation of their curricular and research activities as a key development goal, stating Uzbekistan and other such developing countries as target territories. Nevertheless, in the undertaken interviews no feedback has been received suggesting a thorough analysis of these markets had preceded such a decision, neither it has been made clear what has been assessed to be a rough market value of such undertaking. Furthermore, both the management and the programme heads provided feedbacks on economical viability of the study programmes within the evaluated study field all of which suggest the University has been exercising practice in which study programmes have been run despite the risk of generating financial losses. Even though generating initial losses may indeed be a part of a sound business undertaking aimed at further development of the study field and setup strategically to reach a breakeven point further down into the process, this has not been substantiated neither by the documentation made available, nor with the feedbacks gained through the interviews held.

The lack of strategic thinking and doing may also be observed in the fact that the University could not present a full English version of the strategic development plan document but only a basic overview available at [https://www.llu.lv/sites/default/files/2020-12/StrategijaENG\\_8\\_12\\_2020.pdf](https://www.llu.lv/sites/default/files/2020-12/StrategijaENG_8_12_2020.pdf). For an institution claiming to have been focused on internationalising its services, failing to communicate to the public its strategic development framework via a well-structured documentation and communication channels is deemed highly undesirable.

The decision-making system and the corresponding processes may hardly be seen as efficient given that the University is run by a rather a cumbersome body (the Council) membered by 240 representatives, 50 of which are students. Even though in the undertaken interviews some views were expressed relativising the role of the Council suggesting it's been more of a ceremonial nature, still feedback from the teaching staff suggest reaching final decision on issues such as costly equipment purchase and similar is rather tedious. Moreover, according to the feedback from the management, the rather complex decision making process has also been recognised by the Latvian Government and it is expected to be addressed in the forthcoming legislation.

It may be said that the University has established an effective system of procedures for student admission recognising all relevant achievements of a prospective student and making important admission information available on the website. Nevertheless, as the University recognises itself both in the SER as well as in the undertaken interviews, declining number of enrolled students happens to be one of the biggest challenges to be addressed in years to come. Moreover, as discussed with the interviewed students and graduates, as a result of the omnipresent information abundance, prospective students have less and less time and/or interest to familiarise themselves thoroughly with the content of the intended study programme, which leads to later dissatisfaction

and drop-outs. As such, new approaches, concepts and paradigms to reach out to the interested public and communicate important information on the study programmes more effectively must be contemplated and exercised, going beyond typical “mandatory” requirements like online publishing or similar. In this regard, it is highly recommended that the University take a more proactive approach in generating interest utilising state-of-the-art concepts of digital marketing and business development management. Furthermore, it is recommended that certain organisational changes are made which would provide more substantial logistics to business opportunities and leads generated as a result of the University's internationalisation efforts. Unlike the current scope and operating pattern of the existing International Cooperation Centre (ICC), running a separate organisational unit (or indeed transforming the existing ICC) set up and capacitated to address all issues pertaining an international business undertaking – from administrative, legal to professional issues – seems important and inevitable.

Finally, it may be deemed that the University runs an effective system to detect and/or deter plagiarism. As a result, no major plagiarism-related incidents have been neither reported nor observed. However, as discussed openly in the interviews held with both the management and the teaching staff, further work on campaigns targeting self-plagiarising issues is needed, so is the need for actively promoting academic integrity in the interested public with the University taking a leading and proactive role. The interviewed students have openly expressed concerns that various unethical conduct have been exercised in online exam taking which should be thoroughly investigated and addressed.

## **Conclusions. Strengths and weaknesses**

### **Conclusions:**

The Study Field is well defined and managed, and its study programmes comply with University's strategic development goals. The University maintains good liaisons with the industry through its academic staff, however it does not seem to have been running its operations in a way which would ensure clear and contractually binding relationships with the industry partners. Although in the undertaken interviews some views have been expressed undermining the importance of the contractualisation, suggesting that formalisation of a given cooperation brings nothing more than a mere bureaucracy, it is strongly suggested such a viewpoint is not exercised in practice. The University's objective to internationalise its services is seen as sound and should be hence encouraged. However, for such an undertaking to end up being fruitful, the University must set up a standardised approach and provide a framework which would clearly stipulate expectations, liabilities and responsibilities of a given international or local cooperation.

### **Strengths:**

1. The University runs effective operations delivering outputs which are aligned with the University 's vision and mission. The University recognises major challenges facing the current and the mid-term operations and have been actively trying to address them properly.
2. The University undoubtedly enjoys a position of a renowned Latvian institution provisionally ranked by the interviewed parties among top three engineering-related institutions in Latvia.
3. A number of academic maintain strong liaisons with their industry counterparts to the benefit of both the University and students, in addition to themselves personally.
4. Graduated students are proven to have been highly employable and are seen by the interviewed employer's representatives as having “good personal skills” and “analytical mindset”.

### **Weaknesses:**

1. The University does not seem to have been running its operations in a way which would ensure

clear and contractually binding relationships with the industry partners.

2. Even though the majority of the academic and management processes have been set up properly and adequately, the University is still failing to take an “extra mile” and exercise new approaches, concepts and paradigms in reaching out to the public to generate new type of interest at prospective students and partners, as well as to explore new business opportunities.

3. In reaching out to the public, the University does not play a more proactive role in promoting 21st century way of thinking, social responsibility and academic integrity. Organising public events on issues other than those relating to the academic process as well as stimulating its staff to take part in public debating and in various other forms of critical thinking should hence be strongly encouraged.

## **2. Efficiency of the Internal Quality Assurance System**

### **Analysis**

University has established a quality policy which has been based on the international standards for excellence (operation is accredited according to this standard until December 2022) and publicly available at University's web site as a part of the overall University Development Strategy and covers a broad spectrum of matters. The quality management of study processes is a part of the overall quality management system of the University. The achievement of the goals and targets set by the University's Development Strategy is reported each year at different levels.

The University's quality management system, the quality management system policy and the quality assurance plan ensure continuous improvement, development and efficiency of the study field and corresponding study programmes. However, some evidence of inadequate control on QA procedures was noted, leading to a situation where one cooperation agreement with a partner company named MTZ focused on - according to the description provided - expanding the MTZ sales network. The expert team maintains such cooperation objectives are against fundamental operating principles of any Higher Education Institution (HEI) preventing such scenarios hence need to be addressed in the corresponding QA procedures and regulations.

The University has developed procedures for the development and review of the relevant study programmes with legal document governing this procedure is the Senate decision No. 10-5 of 13 March 2019 “Regulations regarding the Development, Approval and Change of Programmes at LLU”. Implemented procedures for the development and review of the relevant study programmes include wide range of activities:

- preparing an annual self-assessment report for the study direction;
- enhancing and developing the programs;
- planning and controlling the implementation of the programs;
- enhancing and changing a study plan;
- enhancing the syllabuses of courses;
- analyzing the learning outcomes and attendance of students;
- hospitation of teaching personnel;
- provision of material and technological resources;
- provision of methodologies and information for the learning process.

Quality procedures comply with regulatory standards, and may be deemed logical and inclusive of students, teaching staff, graduates, and employers in accordance with Paragraph 3.18. of the LLU

Senate decision No. 9-81. Regarding the regulations on Programme Directors, they address ways on which data on student survey questionnaires are summarised, the students' objections, suggestions and wishes and designs measures for improvement. Despite that, during the visit, experts were assured that LLU pays focused attention to Study Quality Assurance Policy, after face-to-face conversations with students, indication that students are not fully aware of surveys importance as well found during Moodle demonstration that the e-learning environment is not as adapted as possible to gain qualitative feedback or feedback at all.

Statistical data and performance (learning and research) data are collected at certain intervals according to the purpose of use and functional levels of the learning process and research. During meetings with the University management and study programmes directors indicate Internal quality assurance system flaws when direct questions was asked about what happens if an objective (e.g., study programmes quantitative and qualitative indicators) is not met. Given unspecified answers indicate the presence of a development-oriented system "in real live".

Learning performance data are collected based on both external requests for data on students, alumni and academic personnel and internal requests in line with the purpose of use defined.

- At University's level, data on all the faculties, study direction and programs are collected and analyzed

- At Faculty level, data are collected (for collection frequency and responsible persons) and analyzed against the targets set in the Education Section of the Strategy.

- At Faculty level, the data are collected once a year to analyze and assess the performance against the targets. The operational plan of the Faculty of Engineering (TF) contains a section for research performance, and an analysis and assessment of the performance is used to examine the performance in relation to the targets set by the University's Strategy.

- Individual performance – the contribution of each academic personnel member to science is identified once a year, and part of the performance relates to that of TF as stated by the Operational Plan, while part of the performance is assessed individually for each personnel member in accordance with the University's Council of Science decision No. 20-13 at 29 April 2020 On the Assessment of the Scientific Performance of LLU Academic Personnel, Leading Researchers and Researchers. Such an assessment analyses the numbers of research projects, research papers, patents, doctoral dissertations supervised, publicity, the number of papers peer-reviewed and organizational activities.

- At institute level, the individual performance of each academic personnel member as well as each Institute's activities in science and research are summarized once a year and submitted to the University's Science Centre to analyze the institute's performance in science and research with regard to the University's Strategy.

The internal quality assurance system is based on the key principles of European quality management and the standards set in Part 1 of the guidelines of the European Foundation for Quality Management (EFQM). This approach is used to ensure continuity in the identification of problems, the analysis of their causes and effects, the development of a plan for potential solutions and the assessment and implementation of a new solution.

The internal quality assurance system in the study field and the programs contained therein for all the levels of studies is developed in accordance with the European standards, quality assurance requirements and key principles in higher education as prescribed by the European Network for Quality Assurance in Higher Education (ENQA). The internal quality assurance system is based on

the key principles of European quality management and the standards set in Part 1 of the guidelines of the EFQM. This approach is used to ensure continuity in the identification of problems, the analysis of their causes and effects, the development of a plan for potential solutions and the assessment and implementation of a new solution.

The program contained in the study field are regularly assessed according to the internal quality assurance system and in accordance with the European standards and guidelines for internal quality assurance according to nine criteria as prescribed by relevant University and national documents.

An essential part of the internal quality standards and guidelines is incorporated in the study field. The standard Learning Resources and Support for Students has been partly implemented. Assigning and allocating learning resources and support to students takes into account the diversity of the student community (students with life experience, part-time, working and foreign students and students with special needs). At several student hostels and Faculties of University, where reconstruction was carried out, necessary facilities for the disabled are available, thereby ensuring access to education for any student. Lifts, specially equipped amenities, access ramps, as well as well-equipped rooms are available in some buildings. Information on the environment in particular University's buildings is available at University's website (only in Latvian)

### **Conclusions. Strengths and weaknesses**

Conclusions:

Even the Internal Quality assurance system of University has been based on the international standards for excellence during the visit experts became convinced of the low level of understanding of the system processes and process culture from academic staff and student side. As well there is no evidence of the existence of Internal Quality assurance system handbook in place.

Strengths:

1. Quality assurance system based on international standards for excellence

Weaknesses:

1. Lack of efficiency in the e-learning system to get feedback from students

### **3. Resources and Provision of the Study Field**

#### **Analysis**

Regarding the financial resources, University has total common budget for the whole institution, and has developed funding system for the implementation of its study programmes. The University receives around 10 mio EUR from national budget for study process and 2 mio EUR from student tuition fees (SER, page 44 and discussions). Each year University signs agreements with the Ministry of education and science and Ministry of Agriculture regarding budget places and state funding. These agreements determine costs of one study place and other related parameters that help calculate the total cost per student. Each evaluated study programme has its cost per student calculated for each year.

The University Senate is responsible for approving distribution of funds among faculties and study programmes. The University has in place a system to distribute finances among faculties and its study programmes, including covering costs, such as material and service costs (electricity, maintenance), refurbishment and repair costs, transport services, communication services, office goods, library costs etc.

The University and the Faculty of Engineering (hereafter referred to as: TF) also receive finances for basic and performance funding of science. In addition, they also receive funding from different national and international science projects. The University has in place criteria to distribute science funding finances. Another important source of funding are infrastructure improvement projects, where the TF receives its share to invest in the infrastructure and equipment.

The TF also runs projects with the industry. The share of finances from such projects is approximately 6% of the total budget, with the goal of 8% (discussions). Most parts of the industry projects come through Latvian investment agency as partnership programs. They are trying hard for applying for grants and financing - including infrastructure etc.

The discussion with University's and faculty management and teaching staff/researchers showed that they are satisfied with the current financial condition, especially in terms of infrastructure and equipment. They are less satisfied with finances for study process, especially in terms of teaching staff basic salaries.

University infrastructure is described in the SER of the study field (Chapters 3.2 and 3.3) and was also observed during the assessment visit. The majority of study process in observed study field takes place in TF premises that among other covers 17 classrooms, 34 study labs and 7 computer rooms. A smaller part of study process takes place in other faculties' buildings. Classrooms and computer rooms are well equipped with ICT equipment. 10 classrooms were recently renovated with project finances. All buildings are equipped with Wi-fi.

A part of the study process takes place in the laboratories, where scientific work is performed. Annex II-3.1-1 lists the most important material and technical provision of the study direction. The TF possesses many pieces of equipment that is used in study process of the study field evaluated such as metal industry (CNC) machines, 3D prototyping devices, robots, automotive industry sets, agricultural industry vehicles and others. The tour through the TF premises showed that conditions for the research work and study process are appropriate. Of course, not all equipment is state-of-the-art, but may be found sufficient for at least the given study process. A part of the equipment was donated by Latvian companies (e.g. tractors, husbandry equipment).

The University and TF also help students with accommodation (student hotels). Students expressed no bigger issues with finding a place to live while studying at the University. They also have available sports facilities as a part of the University's sports centre.

The University runs its own library. The library has several parts, such as reading room, reference and information centre, quiet reading room, all together almost 800 m<sup>2</sup>. It provides students and teaching staff with the opportunity to use computers and access different databases (scientific journal and article collections) EBSCO, ScienceDirect, Web of Science, Scopus and other. Library includes relevant literature mostly in Latvian and English language. The literature provision rules describe a process for obtaining new literature for teaching staff and students. The library offers different online services as well as on-site services (see SER page 52, 53). Students and teachers had no complaints with LLU library. The library has a yearly budget of over 100.000 EUR.



Overall, teaching staff and students are satisfied with material conditions at the University. The only thing that students miss are student rooms, where they could get together for teamwork or research discussion. Teaching staff would like less bureaucracy in acquiring new equipment.

University teaching staff is regulated via the University Statute. The final decisions on number and positions of academic personnel are in the hands of University's Senate and rector. The general requirements, rights and obligations of applicants for academic positions are stipulated by the Law on HEI. The most important criteria for the selection of the academic staff are scientific and professional competence. During the on-site visit, the interviewed teaching staff confirmed, that regulations and procedures to apply for election in different habilitation titles are clear and transparent in terms that a staff member understands what must be achieved to meet the specific criteria.

During the assessment visit, the interviewed teaching staff have confirmed, that they have possibilities to further improve their skills: digital teaching courses, English language courses, didactics etc. They also have opportunity to take traineeship programmes in companies which are close to their study courses. Academic staff members valued this opportunity highly. Teaching staff also participates in Erasmus+ and other staff mobility projects, but still incoming and outgoing numbers are rather low, like 1-5 persons during the year in the period from 2013-2020.

As it is already pointed out above, students have good study conditions in terms of the infrastructure: buildings, lecture rooms, computer rooms, library, access to scientific data bases, also in distance studies. Students also have access to different software, starting from Microsoft based programmes and professional software depending on the study area: Solidworks, Symulink, AutoCad, MatLab etc. Students also receive digital identity/account and email address. The University offers financial support in the form of scholarships and tuition fee reductions. Students organize themselves in the University Student Self-Government organisation. Active students and graduates did not express having much contact with student organisation.

## **Conclusions. Strengths and weaknesses**

The main strenghts:

- 1) good infrastructure in terms of classrooms, computers rooms, ICT support available for students of the study field and its five study programmes - students and teaching staff are satisfied;
- 2) library infrastructure and its services on a high level;
- 3) sufficient financial funds for TF development in terms of infrastructure and equipment;
- 4) academic staff satisfied with overall conditions at University, including support in their professional development and scientific activities;
- 5) academic staff actively improves their skills through different training options (English language, digital competences, ) and company traineeship programmes;

The main weaknesses:

- 1) no tutorship support system for students
- 2) not much contact of students with University's Student Self-Government
- 3) students are missing student rooms for teamwork / discussions
- 4) rather low level of academic staff incoming and outgoing mobility

## 4. Scientific Research and Artistic Creation

### Analysis

Analysing the submitted list of scientific publications of the teaching staff, where there are more than 500 different publications (2\_dala\_6\_appendix\_macibsp\_publikacijas\_patenti.xlsx). In general, the teaching staff has a relatively large number of publications, but there are a large number of teaching staff (22 out of 80) with three or fewer publications during the reference period, which would be understandable to visiting teaching staff or young professionals, but not for those who are full-time employees at University or have studied at the University's master's or doctoral level (for young professionals). Most of these publications are not indexed. However, it should be mentioned that in this case as well, confirmation has been obtained the compliance of the study field, which is closely related to the scientific activities of the TF, with the development goals of the University, referred to the aims written in the Research Program 2015.-2020. in University Strategy for 2015.-2022. There are research areas, correspond to the field of study, in Research Program, which the University has set as priority research fields in engineering sciences:

1. Research in wood materials and technologies
2. Use of sustainable energy in vehicles
3. Smart technologies and robots in biosystems
4. Sources and use of renewable energy
5. Reduction and rational use of by-products and residues
6. New products from raw materials of plants and animals, their nutritional studies
7. Research of biologically active substances in raw materials of food and products
8. Research of environmental and climate change reducing technologies, hydrology and agricultural runoff
9. Remote sensing, geodesy and geospatial research
10. Sustainable civil engineering, development of new, innovative building materials, research of their properties
11. Safety and performance of building structures with long-term load
12. Systems biology, modelling and optimization of metabolic network
13. Information technology solutions, application of mathematical modelling and statistics in agriculture, environmental and forestry sciences
14. Development and evaluation of intercultural information systems.

As in the SER paragraph 4.1 does not separately analysed the significance of the doctoral study program, although in the study field is the doctoral study program "Agricultural Engineering", but according to the description of this doctoral study program, the results of the study program are achieved gradually during the full study cycle (see Appendix DR\_9). The aims, results, and content of the study courses (see Appendix DR\_10) ensure the achievement of the aim of the study program and the results to be achieved, which are in line with the requirements of the field. Detailed information is summarized in the study program mapping (see Appendix DR\_8), where the result of individual study courses and the result of the study program can be tracked.

The SER mentions and during the assessment visit, both the University's management and the teaching staff confirmed that everyone has a known and clear system of motivation and distribution of performance funding, which includes additional remuneration for involvement in research projects, publications, and preparation of teaching materials. Thus, the connection of research with the study process is defined. Teaching staff find it effective and motivating. Unfortunately, only about 1/3 of the total number of publications (2\_dala\_6\_appendix\_macibsp\_publikacijas\_patenti.xlsx) are publications that are indexed in one of the databases and are not from proceedings of the conference organized by the University itself. Analysing the CV of the teaching staff and discussing the issue with the doctoral students during the visit, it must be concluded that the academic career at University does not seem attractive to the doctoral students. This has a negative impact on

generational change in both pedagogy and research. Most doctoral students are already working in an industry where their salaries are higher than the university is willing to offer at the initial stage. For faculty members who do not yet have a doctorate, a large portion of the workload is in classes. As mentioned in section 4.4 of the self-assessment report, the minimum amount of classroom work for an assistant per year is 512-640 h, for a professor, it is 192-256 h. At such a workload, it is difficult to carry out serious research work in order to achieve qualitative and quantitative indicators that allow for higher motivation and performance bonuses. As a possible solution to this issue could be the motivation fund can allocate part of the resources to young teaching staff and researchers. In the first year, when the young professional does not yet have qualitative or quantitative indicators, he or she could receive motivational funding from this deferred part of the funding. In this way, the new specialists would have the opportunity to start working at the University and achieve the indicators for next year.

The SER mentions that 58% of teaching staff work in the field of research, which suggests that the results obtained in research are also used/integrated into the study process.

During the assessment visit, interviewing representatives of employers and students of all levels has gained confidence that the research results are used at all levels of study, thus it can be considered that the connection of scientific research with the study process is ensured and effective.

The SER contains clear references to the international cooperation between the University and partner universities in the field of study in scientific research, which is indicated by publications created with foreign co-authors (2\_dala\_6\_appendix\_macibsp\_publikacijas\_patenti.xlsx).

In the study programs, lectures have been given by more than 30 guest lecturers from partner universities within the ERASMUS program (2\_part\_5\_annex\_teaching\_staff\_mobility.pdf). Also, within the ERASMUS project, more than 20 students from foreign universities have studied at University (2\_part\_8\_annex\_Foreign\_stud\_staff.pdf). According to information provided (2\_part\_9\_annex\_Stud\_mobility.pdf) on the activity of students of University going to study at foreign universities, it must be concluded that, unfortunately, the outgoing student mobility - 21 students (2013.-2020.) in the study programs Agricultural Engineering (Bachelor), Machine Design and Manufacturing (Bachelor), Agricultural Engineering (Master) is insufficient for the efficient operation of the department responsible for student mobility. The University's website contains extensive and detailed information about the possibility for students to go to mobility to foreign universities (<https://www.llu.lv/lv/erasmus-studejoso-mobilitate-studijas>), but other, more effective ways of promoting student mobility may need to be explored.

The SER of the study field indicates that the University has a program Strengthening Scientific Capacity at the University, the aim of which is to promote the development of the priority research directions defined in the University's science development strategy and the development of appropriate doctoral theses.

University has several conferences with the participation of University's students, i.e., an international scientific student conference Students on Their Way to Science, an international scientific conference of doctoral students, Research for Rural Development, as well as a Scientific conference (only in Latvian) of students and graduate students have taken place in the TF.

Considering the relatively large number of publications and projects of the teaching staff (according to 2\_part\_4\_annex\_CV.zip), it can be concluded that the motivation system, internal grants, and projects developed at the University are effective mechanisms that promote the involvement of the teaching staff in scientific research. Every year several projects are implemented, in which students also participate. Although it should be mentioned that in order to increase the scientific capacity and its quality at University and to promote the involvement of master students, doctoral students, and young scientists in scientific activities, the motivation program needs to be improved with a stronger focus on qualitative indicators and increased motivation of young professionals.

The SER and during the assessment visit has confirmed that innovations are regularly and actively considered in the study process. University has a Department of Technology and Knowledge

Transfer, the task of which is to promote cooperation between scientists, students, and entrepreneurs by developing innovative technological solutions and products with high added value, based on scientific research and interdisciplinary cooperation between scientists and students.

During the assessment visit, the experts were introduced to several study equipment, which has been modernized and implemented by innovative University's teaching staff specifically for the needs of the study process.

The number of patents (2\_dala\_6\_appendix\_macibsp\_publikacijas\_patenti.xlsx) received indicates continuous work on the creation and implementation of various innovations.

## **Conclusions. Strengths and weaknesses**

In general, the university invests a lot of work and resources in science and research. Internal grants and motivation programs are effective and provide good results.

Strengths:

1. The conferences organized by the University create opportunities both to publish their research and to meet with foreign specialists, promoting international cooperation in the field of science.
2. The motivation program of the teaching staff developed at the university was recognized by both the management and the teaching staff of the university as effective in promoting scientific and research activities.
3. The equipment at the disposal of the university is new and modern for scientific research. It is regularly updated or improved.

Weaknesses:

1. Only about 1/3 of the total number of publications are publications that are indexed in one of the databases and are not from proceedings of the conference organized by the university itself.
2. In general, teaching staff have a relatively large number of publications, but there are a large number of teachers (22 out of 80) with three or fewer publications during the reference period, which would be understandable to visiting teachers or young professionals, but not for those who have studied at the university's master's or doctoral level. Most of these publications are not indexed.
3. Analysing the CV of the lecturers and discussing the issue with the doctoral students during the assessment visit, it must be concluded that the academic career at the University does not seem attractive to the doctoral students. This has a negative impact on generational change in both pedagogy and research.

## **5. Cooperation and Internationalisation**

### **Analysis**

Even though the University cooperates closely with a number of institutions and business entities from both Latvia and abroad on different operating levels, the outputs of these corporations are rather modest. As discussed already in Section 1, this may be explained primarily by a complete lack of a structured development framework which would set ground rules and explore ways of generating revenue by means other than typical industry-supported research projects. Failing to provide such a framework is visible at all operational levels. Firstly, it would be somewhat expected that a renowned institution such as the evaluated University would have had introduced appropriate QA procedures aimed at checking the integrity of a given cooperation undertaking and thus preventing cooperation agreement misuse. However, as may be seen from the cooperation agreement list made available (Annex "2\_part\_7\_annex\_Cooperation\_agreements"), as well as from the management feedback, the lack of integrity checking may lead to agreements such as the one

closed with the MTZ AAS company contracted to be aimed at "...bringing MTZ products closer to potential buyers, promoting it, expanding the sales and service network...". It is indeed needless to comment that expanding the sales network of a private business entity can hardly be seen as of any interest to a University. Furthermore, in the cooperation agreement document, only 5 (out of 72) agreements define internship as a subject of the agreement. Also, only 13 of them (18%) are with companies from the private sector of which only 7 focus the cooperation on research-related undertaking, if judged by the description provided.

In addition to the rather disputable practice of setting up cooperations with legal entities, the selection of individual industry experts may also be seen as far from transparent. As has been confirmed by the feedback acquired, the selection of these individuals is rather opportunistic and not run by a set of clear and widely accepted criteria. This indeed does not imply inferior capacities of these individuals, nevertheless, it strongly suggests that selection of both legal entities and industry experts the University intends to cooperate with is not run by efficient and straightforward rules and/or regulations aimed at benefiting the study field and the relevant study programmes.

Inappropriate backdrop for securing effective cooperation and internationalisation may also be seen at the organisational level where some functions and units are duplicated, and it is not entirely clear whether their jurisdictions overlap or not. Thus, for instance, the University runs two separate counselling bodies, namely the International Advisory Board (IAB) and the Council of Counsellors (CoC). Even though the former is reported to have been focused on liaising with academia whereas the latter has been set to provide much valuable inputs from the industry, thus both proving the supposed need for their existence, still, it is not clear why the two sectors (industry and academia) should be addressed separately, especially given that the ultimate goal of any higher education institution is to marry the two and bridge as much as possible typical gaps between academic work and its practical applications. It is therefore highly recommended that the HEI combines the two bodies – IAB and CoC – into a single organisational unit aimed at providing vital feedback on strategic development issues.

Another example of the organisational misalignment may be found in the roles of the International Cooperation Centre (ICC) and its counterpart the Study Centre (SC). Given the title of the former, it would be somewhat expected the ICC to be focused on providing logistics for setting up institutionalised international cooperation. However, according to the description available at <https://www.llu.lv/en/international-cooperation-centre>, it may be concluded that the ICC has been focused solely on providing help to academics and students on mobility-related issues. At the same time, information available in the SER suggests the two differ primarily in the target student population they address which has been further confirmed in the undertaken interviews. Hence, it is hard not to find the ICC redundant especially since the SC is more than likely to have been capacitated to deal with international students matters in addition to the scope of work it has been doing so far.

The lack of organisational alignment and transparency on internationalisation issues may also be witnessed from the role of the so-called Innovation and Technology Transfer Centre (ITTC). Even though it would be somewhat expected the ITTC to be set up to serve as a two-way gateway for information and business opportunity exchange between academia and the industry, both domestically and internationally, it seems to have been focused solely on commercialising University outputs and research capacities.

It may be said that the University has developed a system and procedures aimed at attracting teaching staff and students from abroad within the study field, especially given the number of

signed cooperation agreements with foreign academic institutions. Nevertheless, concrete outputs of these cooperations do not match their number and range. Thus, for instance, even though the University has got – as stated in the SER – “...productive long-term cooperation...” with universities such as Estonian University of Life Sciences, Lithuanian Vytautas Magnus University Agriculture Academy and Czech University of Life Sciences Prague, as well as signed agreements with Klaipeda State University of Life Sciences, Lithuania, Baranovichi State University, Belarus, or West Kazakhstan Agrarian Technical University, it was hard to find evidence of more concrete collaboration going beyond typical guest lecturing. This has also been confirmed by the feedback received from the interviewed students and graduates stating, in total, only two references of foreign guest lectures, one done by a Polish academic, and another one by an academic from Spain. Moreover, the interviewed students, graduates and teachers were generally unaware of any opportunities for their professional or personal development coming as a result of these cooperations.

Unlike the cooperation with academic partners from abroad, the University maintains strong liaisons with Latvian universities and colleges. As can be seen from the cooperation agreement list, the University has got formalised cooperation with HEIs such as Smiltene Technical School, Ogre Technical School, Malnava College and others, and participates in various forms of staff exchange and peer reviewing.

The provision of traineeships has been developed within the study field, however, it has not been properly structured and organised. There are a number of discrepancies both in formal documentation addressing the internship-related collaboration, as well as in feedbacks acquired through the undertaken interviews. An example of the former may be found in the fact that the HEI repeatedly uses the reference of its collaboration with a Latvian subsidiary of a Danish corporation Dinex Group even though both the University's management and the Dinex representative attending the employers meeting have confirmed the cooperation has not been formally contracted. A similar operating pattern may also be found in other such companies like Stokker Ltd and East Metal Ltd. Given that it would be somewhat expected from a renowned international corporation to be run and governed by a set of corporate compliance procedures which are more than likely to mandate formal contracting prior to any collaboration undertaking, the only way to explain such a discrepancy is to treat the existing collaboration a mere consequence of an individual personal liaison between an academic member and his/her industry counterpart rather than an output of a clearly defined and contracted business undertaking. At the same time the feedback from the interviews suggests that the collaboration with the aforementioned companies regularly includes both guest lecturing as well as student reference visits. In this regard, given the expected corporate compliance issues stated above, the lack of formal cooperation operating framework may even jeopardise the existing relationships.

Despite the above, it is beyond any doubt that the University maintains very good relationship with the industry through its staff members. As discussed earlier, such relationships indeed generate positive outputs both in helping students find their traineeship opportunities as well as employment possibilities. The feedback from the interviewed students and graduates suggests that in doing so teacher's dedication often goes beyond a typical student-professor relationship, hence this is indeed something the University should be complimented for. Nevertheless, there is indeed room for improvements, primarily in taking the established relationships further and creating corporate benefits to the partners in addition to the personal ones. Such an attitude has been endorsed by the interviewed employers too. Thus, for instance, the representatives from Toyota and Dinex have clearly expressed their preferences toward taking the existing relationship to the next level, suggesting that any such cooperation should contractually stipulate expected outcomes and thus

related liabilities, and include activities such as participation in curricular development tasks, market trends evaluations, revenue potential assessments, and other such collaboration efforts going beyond typical Alumni-related undertaking.

As stated in the SER, the evaluated study field does not include joint study programmes.

## **Conclusions. Strengths and weaknesses**

### **Conclusions:**

The University maintains an operating practice which undermines the importance of contractual formalisation of cooperation with the industry. By doing so the University somewhat stimulates a liability-free undertaking allowing its employees and partners to even take advantage of established informal cooperations and secure personal gains without significantly benefiting the institution itself. The University provides traineeships opportunities which correspond with the study field, however, these have not been properly structured and organised. The University maintains strong liaisons and exercises good academic exchange with Latvian universities or colleges.

### **Strengths:**

1. The University maintains a very good relationship with the industry through its staff members. Such relationships generate positive outputs both in helping students finding their traineeship opportunities as well as in starting their professional careers. In doing so the academics promote a “can do” and supporting attitude often going beyond a typical professor-student relationship.
2. University's industry partners, both formal and informal, speak highly of both students and academics, and see potential for further improving the existing relationships.
3. The University enjoys a number of liaisons with foreign academic institutions and a number of foreign experts take part in University's development activities through the International Advisory Board.
4. Strong liaisons and good academic exchange with other Latvian universities or colleges.

### **Weaknesses:**

1. Consuming cooperation with the industry without having it agreed contractually.
2. Lack of proactiveness in exercising new approaches to attract and/or secure additional revenue sources.
3. As discussed earlier in Section 1, the University also lacks a clear vision on what are the most promising and economically justifiable means of reaching its development goals related to internationalisation of its research and curricular services.
4. Traineeships opportunities rely heavily on individual academic liaisons.

## **6. Implementation of the Recommendations Received During the Previous Assessment Procedures**

### **Analysis**

-Recommendations of experts given in the previous accreditation of study field during the reference period can be summarized in following points:

“Continue the development of study programs in accordance with the tendencies of international markets.” Recommendation can be considered taken into account and must be implemented constantly in order to stay compliant. Study direction still has room for improvement regarding integration of international trends within study programmes.

“To reduce the number of sub-programs in the master’s study program in order to eliminate

fragmentation and make the study process more efficient" The number of sub-programs in the Master's study program Agricultural Engineering has been reduced from six to five. Recommendation can be considered completed.

"Introduce the evaluation of the master's thesis in a 10- point system in order to see the qualitative indicator of the graduate's final thesis" From 2018, a 10-point scale is used in the evaluation of master's theses. Recommendation can be considered completed.

"Modernize the study course Engineering Graphics by introducing modern software: AutoCad, SolidWorks, SolidEdge or other" Software has been introduced into study programmes. Recommendation can be considered completed.

"To find an opportunity to perform practical welding classes at the Faculty of Engineering" Funding was found and welding stations were equipped for the welding laboratory. Recommendation can be considered completed.

"To create a study program offer for foreign students" A new study program in English has been developed and licensed with the aim of attracting foreign students. Recommendation can be considered completed.

"Pay more attention not only to students' technical knowledge and professionalism, but also to computer skills" Computer skill learning is implicitly integrated in specificity of study programs. Recommendation can be considered completed.

"Continue to invest in the professional development of academic staff." Institution performs various activities to further skills and qualifications of its staff. Recommendation must be implemented constantly in order to stay compliant.

"Continue research projects" Institution seeks opportunities to develop and continue research projects. Recommendation must be implemented constantly in order to stay compliant.

"Continue to develop equipment and facilities" Institution is very active in conducting infrastructure projects. Recommendation must be implemented constantly in order to stay compliant.

"Expand cooperation with other higher education institutions and Jelgava Secondary School of Technologies" Some of the staff members teaches subjects in Jelgava Secondary School of Technologies and some of courses are conducted in premises of faculty. Possibilities for joint program with University of Life Sciences in Prague is being evaluated. Recommendation is partially completed.

-Recommendations considering study program "Biosystems Machinery and Technologies" in particular can be summarized in following points:

"Include information on the prerequisite knowledge for starting the study course in the descriptions of the study courses" All the descriptions of the study courses of the Biosystems Machinery and Technologies study program were revised and changes were implemented. Recommendation can be considered completed.

"Check and link the results to be achieved in the study courses and study program" Institution has provided coherent and specific interpretation regarding study mapping. Recommendation can be considered completed.

"Expand the choice in the part of restricted elective courses, to supplement the compulsory and restricted elective part of the study program with study courses on biological systems" Elective part was supplemented with 6 study courses on biological systems. Recommendation can be considered completed.

"Supplement the lists of literature for compulsory reading and additional reading with the sources in English in the descriptions of separate study courses" Study descriptions were revised. Recommendation can be considered completed.

"Consider the possibility to offer the study program also for students who study in Latvian".

Some of the curricula overlaps with study programs already available in Latvian. Recommendation can be considered completed.



"It would be necessary to specify in the internal regulations the determining factors that would confirm the compliance of each lecturer's knowledge of a foreign language with the requirements of the regulations" Institution is in process and project has been developed for a procedure that would determine the level of foreign language proficiency testing of teachers for work with foreign students. Recommendation can be considered partially completed.

## **Conclusions. Strengths and weaknesses**

The institution takes into account recommendations made by previous assessment and licensing procedures. Out of 17 recommendations, fully completed can be considered 11.

Strengths.

1. University made a lot of improvements according to the recommendations provided during the previous procedures.

Weaknesses.

2. There is still need to develop effective ways how to enact continuous quality improvements e.g. taking into account recent international trends of respective fields into study process.

## **7. Assessment of the Requirements for the Study Field**

- 1 R1 - Pursuant to Section 5, Paragraph 21 of the Law on Institutions of Higher Education, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their internal quality assurance systems:

**Assessment of compliance:** Fully compliant

University ensures continuous improvement, development, and efficient performance of the study field whilst implementing their internal quality assurance systems. All necessary criteria established by the Section 5, Paragraph 21 of the Law on HEI have been met. However experts have identified some areas for further improvement. For instance lack of efficiency in the e-learning system to get feedback from students.

- 2 1.1. The higher education institution/ college has established a policy and procedures for assuring the quality of higher education.

**Assessment of compliance:** Fully compliant

University has established a policy and procedures for assuring the quality of higher education. The information about the quality policy and quality management can be found in SER 1.3 and in document "Quality Management System description and assurance plan"

- 3 1.2. A mechanism for the development 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.

**Assessment of compliance:** Fully compliant

University has established a policy and procedures for assuring the quality of higher education. The information about the quality policy and quality management can be found in SER 1.3 and in document "Quality Management System description and assurance plan"

- 4 1.3. 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.

**Assessment of compliance:** Fully compliant

Information about the study regulations, as well as examination regulations, state examination regulations, study course descriptions etc., provided in annexes.

In the opinion of experts, the following 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:

Study agreement ("Other annexes");

Descriptions of study courses (in the annexes of each program).

- 5 1.4. Internal procedures and mechanisms for assuring the qualifications of the academic staff and the work quality have been developed.

**Assessment of compliance:** Fully compliant

University carries out hospitations ("On the Procedure of Hospitation of Classes at LLU").

The implemented system is described in the section "Other annexes", in the folder "Documents in Latvian" file no. 9.

The implemented system is considered to be an established internal procedure and mechanism for assuring the qualifications the academic staff the work quality have been developed.

- 6 1.5. 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.

**Assessment of compliance:** Fully compliant

University regularly conducts surveys and conducts analysis. Quality procedures comply with regulatory standards, are logical and inclusive of students, teaching staff, graduates, and employers in accordance with Paragraph 3.18. of the LLU Senate decision No. 9-81 of 12 April 2017 Regulations regarding Programme Directors, the programme director summarizes the data of student survey questionnaires, the students' objections, suggestions and wishes and designs measures for improvement.

- 7 1.6. The higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their quality assurance systems.

**Assessment of compliance:** Fully compliant

The improvement of the study field is ensured by the constant cooperation with companies and organizations, which ensure the achievement of the study goals.

University has developed procedures for the development and review of the relevant study programmes with legal document governing this procedure is the Senate decision No. 10-5 of 13 March 2019 "Regulations regarding the Development, Approval and Change of Programmes at LLU". Implemented procedures for the development and review of the relevant study programmes

- 8 R2 - The cooperation with different organisations from Latvia and abroad implemented within the study direction ensures the achievement of the aims of the study direction.

**Assessment of compliance:** Partially compliant

The University maintains very good relationship with the industry through its staff members.

Such relationships generate positive outputs both in helping students finding their traineeship opportunities as well as in starting their professional careers. However, the University maintains

an operating practice which undermines the importance of contractual formalisation of cooperation with the industry. By doing so the University stimulates a liability-free undertaking allowing its employees and partners to even take advantage of established informal cooperations and secure personal gains without significantly benefiting the institution itself.

- 9 R3 - Compliance of scientific research and artistic creation with the development level thereof (if applicable).

**Assessment of compliance:** Fully compliant

Scientific research is in line with the state of the art and is constantly evolving.

- 10 R4 - Elimination of the shortcomings and deficiencies identified during the previous assessment of the study direction, if it has been conducted, or the implementation of the provided recommendations.

**Assessment of compliance:** Fully compliant

Elimination of the shortcomings and deficiencies identified during the previous assessment of the study field has been realised. There are still some improvement and continuous action required.

## 8. Recommendations for the Study Field

### Short-term recommendations

1. In a year introduce a Quality assurance system handbook.
2. Within two years improve course evaluations collection principles in Moodle switching the survey system from free choice requirement to mandatory as a requirement to complete the course or programme (Include the feedback to students for giving evaluation or recommendations).
3. In a year introduce a tutorship support system for students.
4. Until accreditation update the cooperation agreement list and make sure all existing liaisons with an industry partner are agreed upon contractually.
5. Until accreditation update the QA procedures such that to define expectations from cooperating with the industry and preventing cooperation agreement misuse.
6. Until accreditation translate the existing Strategic Development Plan 2015-2022 in English and make sure the same is done for all future strategic development planning documentation. Even though the given planning period is soon to expire, translating the existing planning document into English would provide a much needed benchmark to evaluate future achievements against.
7. In two years reduce the amount of bureaucracy in acquiring new equipment.
8. Until accreditation utilise the paradigms, business models and approaches of modern digital marketing to bring University's study programmes closer to prospective students.

### Long-term recommendations

9. To improve the motivation program by promoting teaching staff's research results, publication of scientific articles, and participation in conferences organized by the local (own university) or partner universities and covering a more comprehensive international network.

|   |
|---|
| 10. University management, department heads, and program directors should regularly monitor the number and quality of teaching staff's publications, paying particular attention to the elected academic staff. Action mechanisms need to be put in place that also have an effect in cases where the motivation to increase salary does not work.  |
| 11. University management must pay special attention to attracting new specialists and doctoral students to academic and scientific activities. In the current motivation program, young professionals who are not yet professors are in a situation where their academic workload is much higher, possibly preventing them from fully engaging in scientific research, which in turn hinders the development of their academic career. |
| 12. Foster importance of University Student Self-Government between students.   |
| 13. Build student rooms for teamwork / discussions.   |
| 14. Foster academic staff incoming and outgoing mobility.   |
| 15. Foster publishing in more highly positioned journals.   |
| 16. The motivation program for young professionals needs to be seriously considered in order to attract them as academic staff.   |
| 17. Although it is very important to work with attracting foreign students, the University must not forget about local potential students.  |
| 18. Carefully define a framework for kicking-off University spin-offs and startups initiated by staff members.  |
| 19. Set up an (International) Cooperation Centre which would be fully capacitated to act as a one-stop-shop for all cooperation inquiries coming from abroad or from a local potential industry partner.  |
| 20. Merge the two existing advisory boards into a single body aimed at bridging the gap between the university and its outside partners. Strengthen the role of such body clearly stipulating expectations and contributions from each of the members. Mandate inclusion of the advisory body in any cooperation undertaking or study programme initiation/revision.  |
| 21. Play a more proactive role in promoting 21st century way of thinking, social responsibility and academic integrity by, for instance, organising public events on issues other than those relating to the academic process. Also, stimulate University's staff to take part in public debating and in various other forms of critical thinking.  |
| 22. Utilise corporate-like management, business development and operating principles when contemplating potentials for alternative revenue sources and/or targeting new territories, despite the obvious downsides of exercising corporate/entrepreneurial mindset in an academic environment.  |
| 23. Develop effective ways how to enact continuous quality improvements - most recent trends of respective fields - into study curriculum.  |

## **II. "Machine Design and Manufacturing" ASSESSMENT**

### **II. "Machine Design and Manufacturing" ASSESSMENT**

#### **1. Indicators Describing the Study Programme**

## Analysis

The name of the professional bachelor study programme “Machine Design and Manufacturing “ (StP) meets the conventional perception of Mechanical Engineering studies at bachelor level. The name of the StP has a logical connection to the content of the profession to be acquired and obligations for the alumni in the industry, as well as competence expected by employers. The name of StP corresponds to the code 42521 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab,Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `42` notes that the StP is professional bachelor program (level 6 of Latvian and European Qualification Framework) and the last three digits `521` notes the StP belongs to the program in “Mechanics and Metal Processing”. Consequently, the awarded degree and qualification “Professional Bachelor Degree in Machine Design and Manufacturing/ Mechanical Engineer” corresponds to the StP's code and title.

Furthermore, the professional nature of the program and the qualification “Mechanical Engineer” corresponds to the Latvian Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education (<https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitiba-valsts-standardu>) and only to the national professional standard Project of “of the professional standard Mechanical Engineer” was developed instead of the expired “Professional standard Mechanical Engineer registration number PS 0307, approved by the Ministry of Education (No. 288, April 22, 2005)”. The development process under the leadership of the Latvian Mechanical Engineering and Metalw). Has provided the Compliance sheet of the StP Machine Design and Manufacturing with the State Education Standard (see StP Annex 6 - MP\_6\_annex\_Compliance\_with\_the\_state\_education\_standard.pdf).

The StP is offered in a full-time studies format of the period of 4 years in Latvian in the amount of 160 Latvian study credit points or 240 ECTS and in a part-time studies format of the period of 5 years in Latvian in the amount of 160 Latvian study credit points or 240 ECTS.

The aims, objectives are strongly linked with content of the profession to be acquired and obligations for the alumni in the industry, as well as competence expected by employers. Knowledge applied to entire study program is very extensive. Students will have an understanding of professional and creative approach to manufacturing technologies, elaboration of project documentation as well as interaction of mechanical, electromechanical, electronic and computer elements. Degree to be conferred show to the employers the graduate's learning outcomes in the machine science. It matches to the goal to provide extensive knowledge about equipment, devices and machines, designing, manufacturing, installation and repair. The tasks are aimed at achieving the goal through three various domains: company development, engineering and creative approach to all activities.

The admission requirements are set centralized and corresponds fully to the legal requirements, are logical and efficient, and supplemented with the necessary legal internal documentation and forms. Joint enrolment system through e-services where applications for 12 Latvian higher educational institutions are processed simultaneously.

The relevance between the program goals and outcomes is discussed at the end of each academic year reviewed by the Board of Studies and approved by the Senate. Once approved, the reports are made public on the University's website - <https://www.llu.lv/lv/studiju-virzieniun-parskati-un-pasnovertejuma-zinojumi> (Only in Latvian).

## Conclusions by specifying the strengths and weaknesses

### Conclusions:

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to the needs of the country for qualified specialists who know agricultural production and product processing technologies.

### Strengths

1. A classic program that provides basic academic knowledge and competences to promote balanced development of rural regions.

### Weaknesses

1. The professional standard needs to be approved

## 2. The Content of Studies and Implementation Thereof

### Analysis

Evaluating the submitted descriptions of study courses, it can be concluded that they have been developed qualitatively and mostly comply with the requirements of regulatory enactments. According to Clause 9 of the Latvian Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education (<https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitibas-valsts-standardu>), not less than 40 percent of the volume of the bachelor's program (except for the volume intended for practice and development of a bachelor's thesis or diploma thesis (diploma project)) in full-time studies, but in bachelor's programs, which belong to the group of educational programs "Music and Performing Arts", not less than 30 percent are contact hours. All study courses meet these requirements. Several descriptions of study courses mention that contact hours make up more than 40% of the total number of hours.

There is a non-compliance in the StP planning with the Latvian Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education (<https://likumi.lv/ta/id/268761-noteikumi-par-otra-limena-profesionalas-augstakas-izglitibas-valsts-standardu>) Clause 11.1. The regulations state that the compulsory content of the bachelor's program consists of general education study courses in the amount of at least 20 credit points - study courses in humanities and social sciences, including study courses that develop basic social, communicative, and organizational skills. In its turn, the StP includes the study course Chemistry (2 CP) in the list of general education study courses, which does not correspond to what is written in the regulations of the Cabinet of Ministers.

As mentioned in the SER, the content of the StP was evaluated by 10 industry experts from different fields and their opinion states that the study program is, in fact, relevant for the industry; the program is comprehensive, courses to be acquired introduce students to basic exact fundamental knowledge and also humanitarian and social knowledge.

In the mapping of the results of study courses, it is possible to trace the link between the results of the StP and the results of individual study courses. The results to be achieved in the StP are covered by the results of the study courses. Analysing the descriptions of study courses, it can be concluded that student-centered education is implemented in the StP. Various teaching methods are used in the study courses - lectures, practical, and laboratory works, group projects, etc. Also, different assessment methods as exam, group project presentation, tests, and practical works are used, which correspond to the specifics of each study course. For example, in the study course "Computer Aided Engineering Design with SolidWorks", student groups independently perform analog research

on a machine, develop machine models and drawings, and prepare a presentation and present the final product. Such a test of skills and knowledge in such a course of study is more effective than a classic exam.

Although the University and the StP management during the assessment visit and the written SER show that regular surveys of students and graduates are conducted, but by interviewing these two groups, there is no confidence in using the results of these surveys to improve the quality of studies. According to the SER, extensive research of the opinions of employers and their representatives regarding the qualification of the graduates of the program, as well as the content of the StP was carried out. 8.2.3.0/18/A/009 ". A number of improvements based on the results of this study are mentioned.

Thus, it can be concluded that the current survey of students and graduates is considered to be formal, which is not followed by further steps in improving the quality of studies.

Data regarding mobility is given 2\_part\_9\_annex\_Stud\_mobility. In order for the acquired during the mobility to be recognized, a procedure has been developed when the director of the StP coordinates the University study plan of the respective semester with the courses offered at the Erasmus partner university before signing the agreement. The students avail themselves of the incoming and outgoing mobility opportunities, and the learning outcomes achieved during such mobility are recognised.

### **Conclusions by specifying the strengths and weaknesses**

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

#### **Strengths:**

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
3. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.

#### **Weaknesses:**

1. The compulsory content of the StP does not comply with the regulations of the Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education.
2. Surveys of students and graduates are formality, without further steps to improve the quality of studies.

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

Due to the Covid-19 pandemic and thus imposed visiting restrictions, the assessment process included assessment visits to University's locations only by two Latvian members of the evaluation team. The inspection of the resources available has therefore been done as a hybrid event combining online participation and on-site evaluation. This has not had any influence on the objectiveness of the assessments made.

The resources to underpin the StP which are outlined in the SER and also listed in a separate

document entitled “Material\_technical\_provision\_of\_the\_study\_direction” to a great extent match the resources presented in the evaluation session. The resources comply with key features and implementation conditions of the StP. The key expected outputs of the StP may be summarised as to produce qualified engineers competent to deal with challenges of modern machine manufacturing and metal processing industries. In this regard, the resources inspected and evaluated in the course of the undertaken assessment may be deemed sufficient for achieving the outcomes set.

In the course of the physical inspection of the resources, the University has demonstrated laboratory and teaching facilities featuring state-of-the-art equipment – both hardware and software – such as CNC machines, 3D printing machines, testing equipment for material testing and others. In this regard, there are no reasons to believe that the University is undercapacitated as to the resources needed to underpin academic processes having to do with the given StP. Nevertheless, the expert team feels important to suggest more effort to be taken to provide industry partners with opportunities to benefit from the advanced laboratory and testing equipment the University has got available.

The University provides adequate bibliographic support to the StP primarily via its library, the so-called the Fundamental Library of the Latvia University of Life Sciences and Technologies (LLU FB). According to the info available on the LLU FB website, the library provides a collection of almost all bibliographic references related to the StP and the Study Field which are published in Latvia. In addition to providing own physical copies, the LLU FB also provides access to relevant electronic bibliographic databases such as ScienceDirect, EBSCO and others, as well as runs interlibrary exchange service. According to the <https://llufb.llu.lv/>, 19% of the LLU FB bibliographic fund is affiliated to engineering sciences.

Overall analysis see in the Chapter 3 "Resources and Provision of the Study Field " of the Experts joint opinion. As discussed in Chapter 3, both the University management and teaching staff interviewed confirmed their satisfaction with current financial means made available for undertaking the StP. Nevertheless, both the stakeholders maintain further financial incentives are needed to attract interest among junior academics. That means, early career teachers and researcher are very much financially dependent as they need substantial financial means to kick-off their typical personal and family life. At the same time, the path to the professorship, which allows an individual for a much more financially stable life, gets challenged every day by lucrative offers coming from the industry. As such, universities struggle to stay competitive in building up and managing their human resources.

### **Conclusions by specifying the strengths and weaknesses**

As said above, from both the SER and the feedback collected, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given Study Programme.

#### **Strengths:**

1. Expected outputs of the StP may be summarised as to produce qualified engineers competent to deal with challenges of modern machine manufacturing and metal processing industries.

#### **Weaknesses:**

1. Lack of providing industry partners with opportunities to benefit from the advanced laboratory and testing equipment the University has got available.



## 4. Teaching Staff

### Analysis

The number of teaching staff is similar as in 2015, but the structure is slightly changed with less full and associate professors included in the StP. The table on page 138 in SER claims that there are only four visiting lecturers in this StP, but the table in Annex 2 part 3 indicates that the share of visiting lecturers is quite higher, including those with election status within University and outside. Altogether, there are 29 members of teaching staff in this StP, 69 % holding Ph.D.

The academic staff members employed in the implementation of the StP carry research and professional experience in the fields relevant for the StP. The teaching staff from this StP is active in projects, but less than teaching staff in e.g. Agricultural Engineering study programmes. Teaching staff use the possibility for traineeship programme in companies. University organises international scientific conference Engineering for Rural Development. Teaching staff publish their research results in scientist journals and proceedings of conferences, although the share of papers published in top scientific journals in WoS indexing database is rather low.

StP has its programme director, who is responsible for the quality and changes in the StP. Teaching staff have open communication between themselves and with StP director. Official communication on the StP also takes place on TF Council.

### Conclusions by specifying the strengths and weaknesses

The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff and also on information flow between the director of the StP and the teaching staff is very good. The scientific activity in terms of publishing could be increased.

Strengths:

1. a good combination of internal and visiting teaching staff
2. teaching staff using traineeship programme in companies
3. good communication between teaching staff and StP director

Weaknesses:

1. scientific activity in terms of publishing is not at a very high level

## 5. Assessment of the Compliance of the Study Programme "Machine Design and Manufacturing"

### Requirements

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

The diploma sample (Annex. "MT Diploma") provided fully complies with the procedure and regulations by which Latvian state-recognised documents of higher education are issued (MK Nr.202 "Kārtība, kādā izsniedz valsts atzītus augstāko izglītību apliecinošus dokumentus")

2. Documents 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.

**Assessment of compliance:** Fully compliant

Agreement in place with Riga Technical University.

- 3 3. 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.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21

- 4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance 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.

**Assessment of compliance:** Fully compliant

Confirmation of state language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 5 5. 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, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Not relevant

- 6 6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Not relevant

- 7 7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

The study agreement sample provided fully complies with the regulation. (MK Nr.70 "Studiju līgumā obligāti ietveramie noteikumi")

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

The descriptions of the study courses and the study materials comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Partially compliant

Confirmation that StP complies with the valid professional standard can be found in Annex MP7. Examination of the current standard has shown that it is not currently up to date. Consequently, in the opinion of experts, there is currently no approved valid standard version available.

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Not relevant

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Partially compliant

Confirmation that study programme complies with Professional Higher Education Standard (MK Nr. 512) found in Annex MP7. The compulsory content of the study program does not comply with the Cabinet Regulation "Regulations on the State Standard of the Second Level Professional Higher Education" 11.1. point.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Annex "2 Part 6" - list of publications - and attached CVs teaching staff has scientific publications, but mostly in one scientific journal and scientific conferences. Although experts are missing more publications in high-ranked journals, teaching staff have practical work experience in accordance with the Law on Institutions of Higher Education.

- 15 R5 - Overall rating

**Assessment of compliance:** Partially compliant

The StP overall generally complies with the legal requirements set forth in the Law on Institutions of Higher Education and other regulatory enactments. By correcting the above shortcomings, the StP has the potential to become fully compliant.

## Requirements (R6-R8)

- 1 R6 - The compliance of the 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 ensuring the achievement of the learning outcomes.

**Assessment of compliance:** Fully compliant

The material and financial conditions for the StP are adequate. TF has sufficient financial funds for development in terms of infrastructure and equipment. The students and teaching staff within StP have good infrastructure in terms of classrooms, computers rooms, ICT support available etc. The same applies for library services. Financial support is sufficient to implement the StP.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

**Assessment of compliance:** Fully compliant

The selection of teaching staff is suitable (based on accreditation data).

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

**Assessment of compliance:** Not relevant

## Conclusions by specifying the strengths and weaknesses

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to the needs of the country for qualified specialists who know agricultural production and product processing technologies.

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

From both the SER and the feedback collected, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP. Nevertheless, the expert team feels important to suggest more effort to be taken to provide industry partners with opportunities to benefit from the advanced laboratory and testing equipment the University has got available.

There are good combination of internal and visiting lecturers in this StP. Teaching staff using traineeship program in companies. Good communication between Teaching staff and StP director.

### Strengths

1. A classic program that provides basic academic knowledge and competencies to promote the balanced development of rural regions.
2. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
3. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
4. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.

### Weaknesses:

1. Scientific activity in terms of publishing is not at a very high level.
2. The compulsory content of the study program does not comply with the regulations of the Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education.
3. Surveys of students and graduates are a formality, without further steps to improve the quality of studies.
4. Lacks "freshness", required for more digital technology and modernity.
5. There is no valid (up to date) professional standard at this moment. This is not the responsibility of the university or the program but is seen as a shortcoming that needs to be addressed by contacting the responsible authorities.

### **Evaluation of the study programme "Machine Design and Manufacturing"**

Evaluation of the study programme:

Good

### **6. Recommendations for the Study Programme "Machine Design and Manufacturing"**

#### **Short-term recommendations**

1. To arrange the content of the StP in accordance with the Cab.Reg. No.512 - Regulations on the State Standard of the Second Level Professional Higher Education 11.1. point.

Until accreditation, a compliance assessment of the program must be carried out when the professional standard will be approved.

#### **Long-term recommendations**

2. More effort must be taken to provide industry partners with opportunities to benefit from the advanced laboratory and testing equipment the University has got available.

3. Develop a survey of students and graduates who make a real contribution to the further improvement of the StP.

4. To supplement the StP with more digital technology and modernity

5. Audit of StP must be performed to determine content compliance with modern and precise technologies used in the industries.

## **II. "Biosystems machinery and technologies" ASSESSMENT**

### **II. "Biosystems machinery and technologies" ASSESSMENT**

#### **1. Indicators Describing the Study Programme**

##### **Analysis**

The name of the Academic bachelor study programme "Biosystems machinery and technologies " (StP) meets the conventional perception of in Mechanical Engineering studies at bachelor level. Title of the StP is a logical continuation of Agricultural Engineering, a title used previously in Latvia, Europe and worldwide. The name of the StP different biological systems operate not only in the

agriculture, but also in the food industry, forestry, renewable energy sector and elsewhere, term 'biosystems' is being used to include all the biological systems existing in these industries. The name of StP corresponds to the code 43525 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab,Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `43` notes that the StP is Academic Bachelor program (level 6 of Latvian and European Qualification Framework) and the last three digits `525` notes the StP belongs to the program in "Mechanical Engineering". Consequently, the awarded degree and qualification "Academic Bachelor Degree in Biosystems machinery and technologies/ Mechanical Engineering" corresponds to the program's code and title.

University provided the compliance sheet of the StP compliance with the state education standard (see BMT\_6\_annex\_Compliance\_with\_the\_state\_education\_standard.docx). The StP is offered in a full-time studies format of the period of 3 years in English in the amount of 120 Latvian study credit points or 180 ECTS.

The aim the StP is to train a University to apply knowledge and abilities, supported by theoretical understanding and critical thinking, to independently identify and manage problems in own professional activity. The aim corresponds with the mission and vision of the University. Obtained – Bachelor Degree of Mechanical Engineering; it will show to employers the graduate's study achievements in field of mechanical engineering. It concords to the goal to provide extensive knowledge of mechatronic equipment, devices and machines, designing, manufacturing, installation and repair.

Procedure for enrolment of foreign students is described on University's website and defined in the Admission Requirements approved by University's Senate. They state that foreigners are admitted to University in compliance with Article 83 of the Law On Higher Educational Institutions; University is organised by the International Cooperation Centre (SSC) in collaboration with the Study Centre (SC) and Language Centre. A foreigner is registered for studies in University if the following conditions fulfil: applicant has a secondary education and final examination assessment corresponds to general admission requirements of University; according to Article 85 of the Law On Higher Education Institutions, a reference was received from the Academic Information Centre on academic recognition of previous education documents; the applicant qualifies for the admission requirements of relevant study programme related to entry and residence in Latvia; applicant has paid a study fee for the first study year. The admission procedure is completed in SSC by drawing up and handing over the created student file to SC. Admission to doctoral studies is subject to the Admission Regulation, approved in the Senate, information about the admission process and documents to be submitted is available on University's website. The admission requirements are set centralized and corresponds fully to the legal requirements, are logical and efficient, and supplemented with the necessary legal internal documentation and forms - both, administrative and academic. Joint enrolment system through e-services where applications for 12 Latvian higher educational institutions are processed simultaneously.

The relevance between the StP goals and outcomes is discussed at the end of each academic year reviewed by the Board of Studies and approved by the Senate. Once approved, the reports are made public on the University's website - <https://www.llu.lv/lv/studiju-virzieni-parskati-un-pasnovertejuma-zinojumi> (Only in Latvian).

## **Conclusions by specifying the strengths and weaknesses**

Conclusions:

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to train a broad profile for the employment in the field of Biosystems Machinery and Technologies who is able to apply knowledge and abilities, supported by theoretical understanding and critical thinking, to independently identify and manage problems in own professional activity. The aim corresponds with the mission and vision of the University.

Strengths

None

Weaknesses

None

## **2. The Content of Studies and Implementation Thereof**

### **Analysis**

Descriptions of study courses are developed qualitatively, they comply with regulatory (Latvian Cab.Reg. No. 240 "Regulations on the State Academic Education Standard") enactments. Given that the StP was licensed only in 2020 and includes study courses that meet the requirements of the newly established program, it can be stated that the content of study courses is relevant and meets both the needs of the industry and scientific trends. For example, the creation of new materials, optimisation of manufacturing processes, the introduction of technological novelties, use of alternative energy resources are relevant in the fields of "Smart materials, technologies, and engineering systems" as well as "Smart energy".

In the mapping of the results of study courses, it is possible to trace the link between the results of the StP and the results of individual study courses. The results to be achieved in the StP are covered by the results of the study courses. Analysing the descriptions of study courses, it can be concluded that student-centered education is implemented in the StP. Various teaching methods are used in the study courses - lectures, practical, and laboratory works. Also, different assessment methods are used, which correspond to the specifics of each study course. For example, in the study course "Computer Aided Engineering Design with SolidWorks", student groups independently perform analog research on a machine, develop machine models and drawings, and prepare a presentation and present the final product. Such a test of skills and knowledge in such a course of study is more effective than a classic exam.

Taking into account that currently there are no students and graduates in the StP, then there are no survey results. In the process of developing the StP, both employers and students of similar StP were interviewed.

At present, the issue of incoming and outgoing student mobility is not relevant.

### **Conclusions by specifying the strengths and weaknesses**

In general, the content of the StP is qualitatively prepared. The content of individual study courses ensures the achievement of the program results.

Strengths:

1. The StP and the content of the study courses included in it correspond to the tendencies of the field.

Weaknesses:

None

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

Due to the Covid-19 pandemic and thus imposed visiting restrictions, the assessment process included site visits to University's locations only by two Latvian members of the evaluation team. The inspection of the resources available has therefore been done as a hybrid event combining online participation and on-site evaluation. Although this has not had any influence on the objectiveness of the assessments made.

The StP is a new study programme taught in English and hence designed to attract international students. The StP follows up the successful legacy of University's dealing with the biosystems engineering and technology theory and practice, and hence sets up learning objectives which may be seen as well proven and tested. These may be summarised as educating competent engineers capacitated to understand, analyse and improve a range of processes having to do mechanics, electronics, automation and control of biosystems engineering systems. In this regard, the resources inspected and evaluated in the course of the undertaken assessment may be deemed sufficient for achieving the outcomes set. Still, it is highly recommended that the University closely monitors the realisation of the study programme and validates its efficiency and successfulness against a set of clearly defined milestones.

Given the nature and the rationale behind the study programme, one of the most important validation measures must be the revenue generation potential. In this regard, even though both the University management and teaching staff interviewed confirmed their satisfaction with current financial means made available for undertaking the StP, still, both the stakeholders maintain further financial incentives are needed to attract interest among junior academics. The financial base may be deemed suitable for provision of the StP, nevertheless, new revenue streams must be contemplated to enable University's competitiveness in building up and managing its human resources.

The University provides adequate bibliographic support to the StP primarily via its library, the so-called the Fundamental Library of the Latvia University of Life Sciences and Technologies (LLU FB). According to the info available on the LLU FB website, the library provides a collection of almost all bibliographic references related to the StP and the Study Field which are published in Latvia. In addition to providing own physical copies, the LLU FB also provides access to relevant electronic bibliographic databases such as ScienceDirect, EBSCO and others, as well as runs interlibrary exchange service. According to the <https://llufb.llu.lv/>, 19% of the LLU FB bibliographic fund is affiliated to engineering sciences.

Overall analysis see in the Chapter 3 "Resources and Provision of the Study Field " of the Experts joint opinion.

#### **Conclusions by specifying the strengths and weaknesses**

The given StP is a new study programme and, as such, its results and spin off effects are yet to be seen.



Strengths:

1. The successful legacy of University's dealing with the biosystems engineering and technology theory and practice, sets up learning objectives which may be seen as well proven and tested.

Weaknesses:

None

#### **4. Teaching Staff**

##### **Analysis**

It is hard to give a specific evaluation of the StP that was just licensed and it is still not started based on the University decision because of Covid-19 situation. SER states that in general there have been no changes in the main parameters of the StP since receiving the license. It applies also to teaching staff. 32 persons are involved in teaching, 20 of them holding Ph.D. 11 of them are visiting lecturers. Based on the assessment of teaching staff it is possible to conclude that they are very active in projects.

The total list of teaching staff projects can be found in Annex II - document Participation of the teaching staff in projects. The list of scientific publications can be found in Annex I - document List of the main publications of the teaching staff for the last six years. Based on the analysis of teaching staff activity and the content of presented projects and publications we can conclude that the teaching staff is active in the area of the study program. Teaching staff and students admitted in the discussions that novel knowledge is included in the study process.

The academic staff members cooperate through the methodological commission of the Faculty of Engineering and Council sittings where important questions concerning programme delivery and necessary changes are discussed.

##### **Conclusions by specifying the strengths and weaknesses**

The qualification and research record of the teaching staff is in general on a satisfactory level.

Strengths:

1. teaching staff active in scientific and industry projects

Weaknesses:

none

#### **5. Assessment of the Compliance of the Study Programme "Biosystems machinery and technologies"**

##### **Requirements**

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

The diploma sample (Annex "BMT Diploma") provided fully complies with the procedure and regulations by which Latvian state-recognised documents of higher education are issued (MK Nr.202 "Kārtība, kādā izsniedz valsts atzītus augstāko izglītību apliecinošus dokumentus")

- 2 2. Documents 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.

**Assessment of compliance:** Fully compliant

Agreement in place with Vytautas Magnus University.

- 3 3. 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.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21

- 4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance 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.

**Assessment of compliance:** Fully compliant

Confirmation of state language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 5 5. 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, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Fully compliant

Confirmation on foreign language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 6 6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Not relevant

- 7 7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21 and attached CVs. At least five professors and associate professors elected to academic positions participate in the delivery of compulsory and restricted elective courses. Checked, the academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

The study agreement sample provided fully complies with the regulation. (MK Nr.70 "Studiju līgumā obligāti ietveramie noteikumi")

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

The descriptions of the study courses and the study materials comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Not relevant

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Council of Higher Education decision No. 1.10/46

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Fully compliant

Confirmation that study programme complies with State Academic Education Standard (MK Nr. 240) found in Annex BMT 6.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Annex "2 Part 6" - list of publications - and attached CVs that each member of the teaching staff has either relevant and up to date publications or at least 5 years of practical work.

## 15 R5 - Overall rating

### **Assessment of compliance:** Fully compliant

The study programme overall generally complies with the legal requirements set forth in the Law on Institutions of Higher Education and other regulatory enactments.

## **Requirements (R6-R8)**

- 1 R6 - The compliance of the 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 ensuring the achievement of the learning outcomes.

### **Assessment of compliance:** Fully compliant

The study programme was not implemented yet. Based on the accreditation data the material conditions are available.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

### **Assessment of compliance:** Fully compliant

The selection of teaching staff is suitable (based on accreditation data).

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

### **Assessment of compliance:** Not relevant

## **Conclusions by specifying the strengths and weaknesses**

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to train a broad profile for the employment in the field of Biosystems Machinery and Technologies who is able to apply knowledge and abilities, supported by theoretical understanding and critical thinking, to independently identify and manage problems in own professional activity. The aim corresponds with the mission and vision of the University. Plan to attract international students must be revised and improved due fact that no students were admitted yet.

In general, the content of the study program is qualitatively prepared. The content of individual study courses ensures the achievement of the program results.

The given StP is a new study programme and, as such, its results and spin off effects are yet to be seen. Still, it is highly recommended that the University closely monitors the realisation of the study programme and validates its efficiency and successfulness against a set of clearly defined milestones. Given the nature and the rationale behind the StP, one of the most important validation measures must be the revenue generation potential.

### Strengths:

1. The StP and the content of the study courses included in it correspond to the tendencies of the field.

2. Wide range of limited choice study courses.

Weaknesses

None

### **Evaluation of the study programme "Biosystems machinery and technologies"**

Evaluation of the study programme:

Good

### **6. Recommendations for the Study Programme "Biosystems machinery and technologies"**

#### **Short-term recommendations**

#### **Long-term recommendations**

1. It is highly recommended that the University closely monitors the realisation of the study programme and validates its efficiency and successfulness against a set of clearly defined milestones.

## **II. "Agricultural Engineering" ASSESSMENT**

### **II. "Agricultural Engineering" ASSESSMENT**

#### **1. Indicators Describing the Study Programme**

##### **Analysis**

The name of the Academic bachelor study programme "Agricultural Engineering" (StP) meets the conventional perception of in Mechanical Engineering studies at bachelor level. Name of the StP is equal to courses titled so elsewhere in Europe and world. The StP includes two sub-programs: Agricultural Machinery and Motor Vehicles. The StP's title fully concords to the Agricultural Machinery section, whereas only partially to the Motor Vehicles section.

The name of StP corresponds to the code 43525 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab.Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `43` notes that the StP is Academic Bachelor program (level 6 of Latvian and European Qualification Framework) and the last three digits `525` notes the StP belongs to the program in "Mechanical Engineering". Consequently, the awarded degree and qualification "Academic Bachelor Degree in Agricultural Engineering / Mechanical Engineering" corresponds to the program's code and title.

Has provided Compliance of the academic bachelor study program Agricultural Engineering with the Regulation (Latvian Cab.Reg. No. 240 "Regulations on the State Academic Education Standard") (see [LI\\_6\\_annex\\_Compliance\\_with\\_the\\_state\\_education\\_standard.pdf](#)). The program is offered in a full-time studies format of the period of 4 years in Latvian in the amount of 160 Latvian study credit points or 240 ECTS and in a part-time studies format of the period of 5 years in Latvian in the amount of 160 Latvian study credit points or 240 ECTS.

The aim of the StP is to prepare highly qualified, creative specialists of agricultural engineering with an open mind-set who could succeed working as technical engineers, managers, in public administration and municipalities related to fields of agricultural machinery and motor vehicles, and

continue graduate studies in agricultural engineering and related programs. Study results in their turn are closely linked to the results defined in the program's goals – highly qualified, creative specialists with wide perspective.

The admission requirements are set centralized and corresponds fully to the legal requirements, are logical and efficient, and supplemented with the necessary legal internal documentation and forms – both, administrative and academic. Joint enrolment system through e-services where applications for 12 Latvian higher educational institutions are processed simultaneously.

The relevance between the StP goals and outcomes is discussed at the end of each academic year reviewed by the Board of Studies and approved by the Senate. Once approved, the reports are made public on the University's website – <https://www.llu.lv/lv/studiju-virzieni-parskati-un-pasnovertējuma-zinojumi> (Only in Latvian)

## **Conclusions by specifying the strengths and weaknesses**

Conclusions:

The interrelation of the analyzed StP elements – name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements – is strong but the development trends of the sector show that the principles of construction, production, maintenance, servicing and repair of agriculture, forest and construction equipment are merging. In Latvia, Europe and the World, these technical segments are more consolidated. In Latvian Qualification Framework included Sectoral Qualifications (6.LKI) "Heavy Vehicle Engineer" includes all these segments. The aim of this profession is to plan, organize, manage, and monitor the maintenance and repair processes of tractor machinery, self-propelled machinery, and stationary equipment, to carry out the design of machinery and production facilities, to develop, implement and improve service and repair technologies, to provide technical support to enterprises in the sector.

Strengths

1. The name of the programme is a brand within the business environment of the region

Weaknesses

Probably, the StP title should be adapted to both sub-programme names to fully concord to both sections.

## **2. The Content of Studies and Implementation Thereof**

### **Analysis**

The volume of compulsory study courses of the StP includes a final thesis – Bachelor's thesis in the amount of 10 CP, according to regulation (Latvian Cab.Reg. No. 240 "Regulations on the State Academic Education Standard") the compulsory part and the limited elective part of the Bachelor's StP include the guidelines, principles, structure and methodology of the respective branch or sub-branch (not less than 25 credit points), history of current branch or sub-branch development and current problems (not less than 10 credit points), as well as characteristics of the sector or sub-sector and problems in the cross-sectoral aspect (not less than 15 credit points). It means, that Bachelor's thesis is not a part of the compulsory part of the StP. This is not considered to be a shortcoming, as the compulsory part of the StP in any case complies with the regulations of the Latvian Cab.Reg. No. 240 "Regulations on the State Academic Education Standard", i.e. its amount exceeds 50 CP.

Industry experts who evaluated the program in 2019 found the content of the program to be fully relevant to the needs of the industry. For example, the creation of new materials, optimisation of

manufacturing processes, the introduction of technological novelties, use of alternative energy resources are relevant in the fields of “Smart materials, technologies, and engineering systems” as well as “Smart energy”.

In general, the descriptions of study courses have been prepared qualitatively and have been updated during the last two years, however, there are some study courses where the amount of compulsory literature seems disproportionately large. For example, in the study course Production Technology and Quality Management II, which is a 2 CP study course and 48 hours for independent work, the list of compulsory literature includes 10 sources, seven of which exceed 100 pages.

The principles of student-centered teaching have been observed in the implementation of study courses and assessment procedures. By interviewing students and graduates during the assessment visit, it was gained that the teaching staff takes into account the different previous levels of preparation of students and provides the necessary consultations.

The methods mentioned in the descriptions of study courses contribute to the achievement of the goals of the study course and the StP.

The StP management during the assessment visit and the written SER shows that regular surveys of students and graduates are conducted, but by interviewing these two groups, there is no confidence in using the results of these surveys to improve the quality of studies.

According to the SER, extensive research of the opinions of employers and their representatives regarding the qualification of the graduates of the StP, as well as the content of the StP was carried out. 8.2.3.0/18/A/009 ". A number of improvements based on the results of this study are mentioned.

Before going on mobility, a plan is agreed to ensure that what is learned during the mobility is recognized.

### **Conclusions by specifying the strengths and weaknesses**

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

Strengths:

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
3. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.

Weaknesses:

1. No significant shortcomings have been observed, but it would be necessary to evaluate the volume of the compulsory part of the literature of individual study courses, possibly something can be directed to additional literature.

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

In the undertaken assessment, given the Covid19-related restrictions, it has been difficult to discriminate resources and their availability for a particular level of the same study programme. As such, there are no reasons to assume a BSc-level study programme would be undercapacitated as

to the resources available if an MSc level of the same programme provides adequate capacities and resources. In this regard, the expert team feels the same analysis is applicable to both "Agricultural Engineering"45525 and "Agricultural Engineering"43525 study programmes.

The resources to underpin the StP which are listed in the SER to a great extent match the resources presented in the evaluation session. The resources comply with key features and implementation conditions of the StP and may be deemed sufficient for achieving the learning outcomes set. In addition to lecture rooms and common areas, in the evaluation session dedicated lab facilities for vehicle design and diagnostics, as well as for alternative propulsion systems testing were presented. These facilities feature equipment such as BMW test beds, Renault Clio powertrain conversion, and other such facilities. All of the presented are deemed appropriate and sufficient enough to match the needs of the StP.

Given the descriptions provided in the SER and the information available online, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP. According to information available at the Fundamental Library of the Latvia University of Life Sciences and Technologies (LLU FB), the University runs a biggest collection of agricultural bibliographic titles in Latvia which also serves as a reference collection for the UN Food and Agriculture Organisation and other such associations. In total, 38% of the overall LLU FB bibliographic fund is affiliated to agriculture. This, coupled with the LLU FB services providing access to various electronic bibliographic databases such as ScienceDirect, EBSCO and others, may be deemed as adequate for the provision of the study programme analysed.

Overall analysis see in the Chapter 3 "Resources and Provision of the Study Field " of the Experts joint opinion. As discussed in Chapter 3, both the University management and teaching staff interviewed confirmed their satisfaction with current financial means made available for undertaking the StP. Nevertheless, both the stakeholders maintain further financial incentives are needed to attract interest among junior academics. That means, early career teachers and researcher are very much financially dependent as they need substantial financial means to kick-off their typical personal and family life. At the same time, the path to the professorship, which allows an individual for a much more financially stable life, gets challenged every day by lucrative offers coming from the industry. As such, universities struggle to stay competitive in building up and managing their human resources.

Nevertheless, the expert team maintains important to suggest more effort to be taken to provide students with opportunities to get proper hands-on experience in dealing with agricultural and other such machinery in house in addition to the experience acquired through the mandatory internships. Both the interviewed students and employers were very vocal when it comes to the need of being in touch with the most advanced technology. As such, it is deemed critical to provide an appropriate number of machine elements and parts taught in the StP to facilitate the practical part of the teaching process. One such example is providing components, elements and software needed to explore electric propulsion systems theory and practice.

### **Conclusions by specifying the strengths and weaknesses**

As explained under "Analysis", the expert team feels the same conclusions are valid and applicable to both "Agricultural Engineering"45525 and "Agricultural Engineering"43525 study programmes. As said above, from both the SER and the feedback collected, there are no reasons to believe that the



University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP.

Strengths:

1. Appropriate equipment for this StP.

Weaknesses:

None

#### **4. Teaching Staff**

##### **Analysis**

The structure of teaching staff in terms of numbers is in general not changing during the last 6 years, except with the decrease of teaching staff in 2020/21 (15 people less than in 2019). 60% hold Ph.D. titles and are elected at LLU. The study programmes have several visiting lecturers bring their experiences and practical knowledge into the study programme. 27 academic staff members, in parallel to their academic position, were elected as leading researchers or researchers.

The academic staff members employed in the implementation of the study programme carry research and professional experience in the fields relevant for the study programme. The teaching staff from this study programme is active in projects, except for some of them. Most of the teaching staff are active in publishing, but mostly through publishing in conference proceedings (although sometimes listed in WoS, Scopus...) and in one "local" scientific journal Agronomy research. These research and professional experiences are also transferred to the study process, especially in terms of updating the course materials.

The big advantage is that teaching staff motivates their students to write practical diploma thesis dealing with challenges in companies. Some of these diploma theses are also rewarded.

The communication between teaching staff and with faculty management is good. This study programme fosters cooperation between different centres and institutes. The main mechanism is combining lecturers from different areas (centres, institutes) to work together on a single course.

The total list of teaching staff projects can be found in Annex II - document Participation of the teaching staff in projects. The list of scientific publications can be found in Annex I - document List of the main publications of the teaching staff for the last six years. Based on the analysis of teaching staff activity and the content of presented projects and publications we can conclude that the teaching staff is active in the area of the study program.

##### **Conclusions by specifying the strengths and weaknesses**

The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff and also on information flow between the director of the StP and the teaching staff is very good. The scientific activity in terms of publishing could be increased.

Strengths:

1. visiting lecturers with practical experiences
2. teaching staff involved in projects
3. teaching staff motivates students for diploma thesis in companies
4. good communication between teaching staff and programme director

Weaknesses:

1. scientific activity in terms of publishing is not at a very high level

## 5. Assessment of the Compliance of the Study Programme "Agricultural Engineering"

### Requirements

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

The diploma sample (Annex "LI Diploma") provided fully complies with the procedure and regulations by which Latvian state-recognised documents of higher education are issued (MK Nr.202 "Kārtība, kādā izsniedz valsts atzītus augstāko izglītību apliecinošus dokumentus")

2. Documents 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.

**Assessment of compliance:** Fully compliant

Agreement in place with Riga Technical University.

3. 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.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21

4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance 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.

**Assessment of compliance:** Fully compliant

Confirmation of state language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

5. 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, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Not relevant

6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Not relevant

7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21 and attached CVs. Checked, the academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education. Checked, the academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

The study agreement sample provided fully complies with the regulation. (MK Nr.70 "Studiju līgumā obligāti ietveramie noteikumi")

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

The descriptions of the study courses and the study materials comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Not relevant

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Council of Higher Education decision No. 1.10/77

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Fully compliant

Confirmation that study programme complies with State Academic Education Standard (MK Nr. 240) found in Annex LI 6.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

Confirmation can be found in Annex "2 Part 6" - list of publications - and attached CVs that teaching staff has scientific publications, but mostly in one scientific journal and scientific conferences. We are missing more publications in high-ranked journals.

- 15 R5 - Overall rating

**Assessment of compliance:** Fully compliant

The study programme overall generally complies with the legal requirements set forth in the Law on Institutions of Higher Education and other regulatory enactments.

### **Requirements (R6-R8)**

- 1 R6 - The compliance of the 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 ensuring the achievement of the learning outcomes.

**Assessment of compliance:** Fully compliant

The material and financial conditions for the study programme are adequate. TF has sufficient financial funds for development in terms of infrastructure and equipment. The students and teachers within study programme have good infrastructure in terms of classrooms, computers rooms, ICT support available etc. The same applies for library services. Financial support is sufficient to implement the study programme.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

**Assessment of compliance:** Partially compliant

The selection of teaching staff is suitable (based on accreditation data). Considering that this is an academic study programme teaching staff should have more scientific activity, publication, etc. experts missing more publications in high-ranked journals.

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

**Assessment of compliance:** Not relevant

### **Conclusions by specifying the strengths and weaknesses**

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong but the development trends of the sector show that the principles of construction, production, maintenance, servicing and repair of agriculture, forest and construction equipment are merging. In Latvia, Europe and the World, these technical segments are more consolidated. In Latvian Qualification Framework included

Sectoral Qualifications (6.LKI) "Heavy Vehicle Engineer" includes all these segments. The aim of this profession is to plan, organize, manage, and monitor the maintenance and repair processes of tractor machinery, self-propelled machinery, and stationary equipment, to carry out the design of machinery and production facilities, to develop, implement and improve service and repair technologies, to provide technical support to enterprises in the sector. It is in the interests of the industry that University introduce and develop the offer of the professional qualification "Heavy Vehicle Engineer" study program.

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

**Strengths:**

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
3. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.
4. Train qualified, creative, and competent specialists in the sphere of an agricultural engineering program to promote the balanced development of rural regions.
5. Visiting lecturers with practical experiences.
6. Teachers involved in projects.
7. Teachers motivate students for diploma thesis in companies.
8. Good communication between teachers and program director.

**Weaknesses:**

1. The content of the program shows that it has been unchanged for a long period of time.
2. Scientific activity in terms of publishing is not at a very high level.
3. The volume of the compulsory part of the literature of individual study courses is too large, part may be transferred to additional literature.

## **Evaluation of the study programme "Agricultural Engineering"**

Evaluation of the study programme:

Good

## **6. Recommendations for the Study Programme "Agricultural Engineering"**

### **Short-term recommendations**

It would be necessary to evaluate the volume of the compulsory part of the literature of individual study courses, possibly something can be directed to additional literature.

### **Long-term recommendations**

Audit of StP must be performed to determine compliance with modern and precise technologies used in the relevant industries.

## **II. "Agricultural Engineering" ASSESSMENT**

### **II. "Agricultural Engineering" ASSESSMENT**

## 1. Indicators Describing the Study Programme

### Analysis

The name of the Academic Master study programme “Agricultural Engineering” (StP) meets the conventional perception of Mechanical Engineering studies at Master level.

Title of the program consists of two words unmistakably reflecting the essence of the study field. Coherence of program’s title and field is accurate and obvious. Admission criteria are related to the necessary knowledge and skills as well as qualification for starting the studies in Master of Engineering study program. When graduating from the Master’s study program, students get Master Degree in Engineering, which is closely linked to the title of the study program and proposed goals.

The name of StP corresponds to the code 45525 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab.Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `45` notes that the Academic Master StP (7th level of the Latvian Qualifications Framework (henceforth – LQF) and European Qualifications Framework (henceforth – EQF)) and the last three digits `525` notes the StP belongs to the program in “Mechanical Engineering”. Consequently, the awarded degree and qualification “Academic Master StP in Agricultural Engineering / Master Degree of Mechanical Engineering” corresponds to the program’s code and title.

Has provided Compliance that Master’s study program Agricultural Engineering complies with the Cabinet Regulation (only in Latvian) No. 240 of 13 May 2014 “Regulation on the national standard for academic education”. All the requirements stipulated in that standard are met. (see [MG\\_6\\_annex\\_Compliance\\_with\\_the\\_state\\_education\\_standard.pdf](#)). The program is offered in a full-time studies format of the period of 2 years in Latvian and in English in the amount of 80 Latvian study credit points or 120ECTS.

The main task of the study program is to provide an opportunity for master students to acquire in-depth theoretical and practical knowledge in the chosen field of engineering, as well as to acquire pedagogical and scientific research work skills. Four sub-tasks are subordinated to the main task, which are defined for each study sub-program separately. The main task and subtasks of the studies are closely related and subordinated to the aim of the study program. The results of the study program, which include the knowledge, skills and competencies defined by the academic master's study program, are strictly subordinated to the aim of the study program, observing the requirements included in the relevant regulatory documents.

Admission conditions ensure comprehensible information about the qualification, knowledge, skills and competences acquired in the study program. Admission conditions clearly define what documents and previous education is required to start the studies (website). Information is available also on LLU website. The relevance between the program goals and outcomes is discussed at the end of each academic 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-virzieni-un-pasnovertejuma-zinojumi> (Only in Latvian).

### Conclusions by specifying the strengths and weaknesses

Conclusions:

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong. In sectoral qualification structure included the 7th LQF professional qualification "Technical Expert of Road Vehicles", the aim of which is to assess the conformity of the vehicle's design, assembly and technical condition with the existing regulations, to provide an opinion on the causes of damages and fractures of vehicles, the quality of repair, the connection of the road traffic accident with the technical condition of the vehicle, to perform the assessment and analysis of loss calculations, to organize expertise

process, project monitoring and documentation. The industry is interested in the development of the offer of this qualification study program at the LLU and more in-depth professional competences.

#### Strengths

1. Acquire in-depth wide theoretical and practical knowledge in the chosen field of engineering.

#### Weaknesses

None

## 2. The Content of Studies and Implementation Thereof

### Analysis

In general, evaluating the submitted descriptions of study courses, it can be concluded that they have been developed qualitatively and mostly comply with the requirements of regulatory enactments. According to Clause 19 of the Cabinet Regulation (only in Latvian) No. 240 of 13 May 2014 "Regulation on the national standard for academic education", in full-time studies not less than 30% of the volume of the master's study program (except for practice, if any, and the volume intended for the development of the master's thesis) consists of contact hours. In turn, several descriptions of specialization study courses mention that contact hours make up 40% of the total number of hours. Although, by allocating five credit points for the master's thesis more than it is necessary as well as including internships in the academic program in the amount of two credit points, which is not a mandatory requirement, the program does not include the part of free choice study courses that could be relevant for students to acquire any missing knowledge.

The content of study courses is topical.

Analysing the submitted program mapping, it can be seen that the study courses are mutually complementary in order to achieve the goals set by the StP. Evaluating the content and literature of the study courses, as well as asking the representatives of employers during the assessment visit, it can be concluded that they correspond to the needs of the industry and scientific trends.

The evaluation methods mentioned in the descriptions of study courses are reasonable, logical and aimed at achieving results. Students already have clear instructions about the requirements of the study course before starting the study course.

Industry experts who evaluated the program in 2019 found the content of the program is fully relevant to the needs of the industry. This is confirmed, for example, by the study course "Intelligent Technologies and Systems", which is a compulsory study course for the whole program and is important in modern production. There is a topic such as the Internet of Things (IoT) in this study course, which is currently relevant in all fields.

The SER states that the TF is increasingly implementing elements of a student-centered approach. In cases when students have different levels of previous knowledge, Teaching staff can offer additional consultations and materials for learning a specific topic. During the assessment visit, confirmation has been received from students and graduates that the teaching staff is welcoming and consultations are available.

It is a questionable fact that in the master's level program, most study courses do not require prior knowledge. Only five of the 58 study courses mention the necessary prior knowledge. This is especially important for limited choice and free choice study courses, so that the student can choose a study course corresponding to his / her current level of knowledge, or can choose an additional study course to obtain the necessary prior knowledge. In this way, both the student and the teaching staff can work more productively.

The University conducts surveys of students and graduates. The StP managers indicated that they take into account the results of the surveys, however, during the assessment visit, students,

graduates, and employers did not provide confidence in the use of real survey results to improve the quality of studies. Students and graduates indicated that they had completed the questionnaires (surveys), but this is often done and also perceived by students as a formality, with no visible results. The SER of the University mentions that in 2019 the StP was evaluated by industry experts within the framework of the ESF project and work will be done on the modernization of the program. Experts have not been informed what modernization measures are planned. At the same time, the SER states that the study content of the StP is fully in line with the needs of the industry and the labor market.

2.7 of the SER, it was mentioned that during the assessment period there were only 3 students in the ERASMUS exchange program at the Czech University of Life Sciences. Experts think, that this is not enough to consider outgoing mobility as an opportunity for students to take advantage of. Although section 2.6 of the SER It is mentioned that 53% of students are satisfied with the opportunities to participate in international exchange programs, such as ERASMUS.

Analysing the information provided in the SER, there have been only 2 students from Kazakhstan in incoming student mobility during the assessment period. Student training took place individually, according to an individually developed and coordinated study plan, adapting to students' wishes. Such adaptation of the StP to the wishes of students, if the number of such students is so small, is uneconomical and inefficient. Such mobility does not justify itself. If work is not done to ensure greater inbound mobility, then university management must seriously consider the need for it.

### **Conclusions by specifying the strengths and weaknesses**

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

Strengths:

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
3. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.

Weaknesses:

1. Weak student inbound and outbound mobility is particularly irrational in the context of inbound mobility.
2. Most study course descriptions do not mention the necessary prior knowledge
3. The StP does not include the part of free choice study courses that could be relevant for students to acquire any missing knowledge

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

Due to the Covid-19 pandemic and thus imposed visiting restrictions, the assessment process included site visits to University's locations only by two Latvian members of the evaluation team. The inspection of the resources available has therefore been done as a hybrid event combining online participation and on-site evaluation. This has not had any influence on the objectiveness of the assessments made.



The resources to underpin the StP which are listed in the SER to a great extent match the resources presented in the evaluation session. The resources comply with key features and implementation conditions of the StP and may be deemed sufficient for achieving learning outcomes set. In addition to lecture rooms and common areas, in the evaluation session dedicated lab facilities for vehicle design and diagnostics, as well as for alternative propulsion systems testing were presented. These facilities feature equipment such as BMW test beds, Renault Clio powertrain conversion and other such facilities. All of the presented are deemed appropriate and sufficient enough to match the needs of the StP.

Given the descriptions provided in the SER and the information available online, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP. According to information available at the Fundamental Library of the Latvia University of Life Sciences and Technologies (LLU FB), the University runs a biggest collection of agricultural bibliographic titles in Latvia which also serves as a reference collection for the UN Food and Agriculture Organisation and other such associations. In total, 38% of the overall LLU FB bibliographic fund is affiliated to agriculture. This, coupled with the LLU FB services providing access to various electronic bibliographic databases such as ScienceDirect, EBSCO and others, may be deemed as adequate for the provision of the study programme analysed.

Overall analysis see in the Chapter 3 "Resources and Provision of the Study Field " of the Experts joint opinion. As discussed in Chapter 3, both the University management and teaching staff interviewed confirmed their satisfaction with current financial means made available for undertaking the StP. Nevertheless, both the stakeholders maintain further financial incentives are needed to attract interest among junior academics. That means, early career teachers and researcher are very much financially dependent as they need substantial financial means to kick-off their typical personal and family life. At the same time, the path to the professorship, which allows an individual for a much more financially stable life, gets challenged every day by lucrative offers coming from the industry. As such, universities struggle to stay competitive in building up and managing their human resources.

Nevertheless, the expert team maintains important to suggest more effort to be taken to provide students with opportunities to get proper hands-on experience in dealing with agricultural and other such machinery in house in addition to the experience acquired through the mandatory internships. Both the interviewed students and employers were very vocal when it comes to the need of being in touch with the most advanced technology. As such, it is deemed critical to provide an appropriate number of machine elements and parts taught in the StP to facilitate the practical part of the teaching process. One such example is providing components, elements and software needed to explore electric propulsion systems theory and practice.

### **Conclusions by specifying the strengths and weaknesses**

As said above, from both the SER and the feedback collected, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP.

Strengths:

1. Equipment is appropriate such as BMW testbeds, Renault Clio powertrain conversion and other such facilities.

Weaknesses:

1. Lack of opportunities for students to getting proper hands-on experience in dealing with agricultural and other such machinery in house in addition to the experience acquired through the mandatory internships.

#### **4. Teaching Staff**

##### **Analysis**

The structure of teaching staff in terms of numbers is not changing, but the qualification of teaching staff significantly increased, where not 13 full professors are involved in the StP. In general, the number of involved teaching staff holding a Ph.D. also increased. Most of the teaching staff in this StP are internal.

The academic staff members employed in the implementation of the StP carry research and professional experience in the fields relevant for the StP. The teaching staff from this StP is active in projects, except for some of them. Most of the teaching staff is active in publishing, but mostly through publishing in conference proceedings (although sometimes listed in Wos, Scopus...) and in one "local" scientific journal Agronomy research.

The teaching staff is using different possibilities to improve their competencies and skills, including improving English language, didactics, visiting seminars and teaching exchange, such as Erasmus.

The cooperation between teaching staff is often limited on specific subjects, where at least two lecturers participate. The academic staff members cooperate through methodological commission of the TF and Council sittings where important questions concerning StP delivery and necessary changes are discussed.

##### **Conclusions by specifying the strengths and weaknesses**

The qualification and research record of the teaching staff is in general on a satisfactory level. The mechanism of collaboration between the teaching staff and also on information flow between the director of the StP and the teaching staff is very good, although the scientific activity in terms of publishing could be increased and teaching staff is not involved in projects for a longer period of time.

Strenghts:

1. teaching staff very active in different research and industry projects
2. teaching staff is using different options to improve their competencies and skills
3. good cooperation through methodological commission

Weaknesses:

1. scientific activity in terms of publishing is not at a very high level
2. some of the teaching staff is not involved in projects for a longer period of time

#### **5. Assessment of the Compliance of the Study Programme "Agricultural Engineering"**

##### **Requirements**

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

The diploma sample (Annex "MG Diploma") provided fully complies with the procedure and regulations by which Latvian state-recognised documents of higher education are issued (MK Nr.202 "Kārtība, kādā izsniedz valsts atzītus augstāko izglītību apliecinošus dokumentus")

- 2 2. Documents 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.

**Assessment of compliance:** Fully compliant

Agreement in place with Riga Technical University.

- 3 3. 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.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21

- 4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance 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.

**Assessment of compliance:** Fully compliant

Confirmation of state language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 5 5. 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, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Fully compliant

Confirmation on foreign language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 6 6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Not relevant

- 7 7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21 and attached CVs. Checked, the academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

The study agreement sample provided fully complies with the regulation. (MK Nr.70 "Studiju līgumā obligāti ietveramie noteikumi")

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

The descriptions of the study courses and the study materials comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education. However, most study course descriptions do not mention the necessary prior knowledge.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Not relevant

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Council of Higher Education decision No. 1.10/78

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Fully compliant

Confirmation that study programme complies with State Academic Education Standard (MK Nr. 240) found in Annex MG 6.

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

Confirmation can be found in Annex "2 Part 6" - list of publications - and attached CVs that teaching staff has scientific publications, but mostly in one scientific journal and scientific conferences. Experts are missing more publications in high-ranked journals.

#### 15 R5 - Overall rating

##### **Assessment of compliance:** Fully compliant

The study programme overall generally complies with the legal requirements set forth in the Law on Institutions of Higher Education and other regulatory enactments.

#### **Requirements (R6-R8)**

- 1 R6 - The compliance of the 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 ensuring the achievement of the learning outcomes.

##### **Assessment of compliance:** Fully compliant

The material and financial conditions for the StP are adequate. TF has sufficient financial funds for development in terms of infrastructure and equipment. The students and teachers within the study program have good infrastructure in terms of classrooms, computers rooms, ICT support available, etc. The same applies to library services. Financial support is sufficient to implement the study program.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

##### **Assessment of compliance:** Fully compliant

The selection of teaching staff is suitable (based on accreditation data).

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

##### **Assessment of compliance:** Fully compliant

The large number of publications of the teaching staff, which is related to the specifics of the study courses to be taught, testifies to the topicality of the study courses included in the program (2\_dala\_6\_pielikums\_macibsp\_publikacijas\_patenti.xlsx).

#### **Conclusions by specifying the strengths and weaknesses**

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong. In sectoral qualification structure included the 7th LQF professional qualification "Technical Expert of Road Vehicles", the aim of which is to assess the conformity of the vehicle's design, assembly and technical condition with the existing regulations, to provide an opinion on the causes of damages and fractures of vehicles, the quality of repair, the connection of the road traffic accident with the technical condition of the vehicle, to perform the assessment and analysis of loss calculations, to organize expertise process, project monitoring and documentation.

As said above, from both the SER and the feedback collected, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP.

#### Strengths:

1. Teachers are using different options to improve their competencies and skills.
2. Good cooperation through methodological commission.
3. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
4. Various assessment methods are used in the study courses, which are adapted to the specifics of the study course.
5. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.
6. Acquire in-depth wide theoretical and practical knowledge in the chosen field of engineering.

#### Weaknesses:

1. Scientific activity in terms of publishing is not at a very high level.
2. Some teachers are not involved in projects for a longer period of time.
3. Weak student inbound and outbound mobility is particularly irrational in the context of inbound mobility.
4. Most study course descriptions do not mention the necessary prior knowledge
5. The StP does not include the part of free choice study courses that could be relevant for students to acquire any missing knowledge
6. Lack of opportunities for students to getting proper hands-on experience in dealing with agricultural and other such machinery in house in addition to the experience acquired through the mandatory internships.
7. Experts are missing more publications of teaching staff in high-ranked journals.

### **Evaluation of the study programme "Agricultural Engineering"**

Evaluation of the study programme:

Good

### **6. Recommendations for the Study Programme "Agricultural Engineering"**

#### **Short-term recommendations**

1. The description of study courses must be corrected, supplementing them with the necessary prior knowledge.

#### **Long-term recommendations**

2. The department dealing with student inbound and outbound mobility needs to work harder to motivate and encourage students. The system needs to be sorted out.
3. The teaching staff motivation system needs to be redesigned to encourage the production of higher quality publications and the involvement of teaching staff in projects.
4. To consider the possibility to modify the content of the StP so as to include optional study courses.

- |  |
|--|
| 5. More effort to be taken to provide students with opportunities to get proper hands-on experience in dealing with agricultural and other such machinery in house in addition to the experience acquired through the mandatory internships. |
| 6. Need to provide more publications from academic staff in high-ranked journals.  |

## II. "Agricultural Engineering" ASSESSMENT

### II. "Agricultural Engineering" ASSESSMENT

#### 1. Indicators Describing the Study Programme

##### Analysis

The name of the Doctoral StP "Agricultural Engineering" "meets the conventional perception of Engineering Sciences at Doctoral level. Graduates of postgraduate study (only in Latvian) program Agricultural Engineering are conferred a Doctoral Degree of Engineering Sciences thus achieving the goal of postgraduate studies – to promote development of agricultural engineering and create highly qualified new scientists of international level in sub-field of agricultural engineering as well as to ensure renewal of the composition of academic staff members of the Faculty of Engineering.

The name of StP corresponds to the code 51525 of the StP according to Latvian Education Classification (Latvian Cabinet of Ministers Regulations (Cab.Reg.) No. 322, <https://likumi.lv/ta/id/291524-noteikumi-par-latvijas-izglitiba-klasifikaciju>), meaning that first two digits `51` notes that the StP is Doctoral program (8th level of the Latvian Qualifications Framework (henceforth – LQF) and European Qualifications Framework (henceforth – EQF)) and the last three digits `525` notes the StP belongs to the program in "Mechanical Engineering". Consequently, the awarded degree and qualification "Academic Master StP in Agricultural Engineering / Doctoral degree Doctor of Science (Ph.D.) in Environmental Engineering and Energetics" corresponds to the program's code and title.

In accordance with Part 2 of Section 55 of the Law on Higher Education Institutions, the Council of Higher Education decide (confirmation letter\_Riga/11 November 2020/No. 1.10/79) to support implementation of the Academic doctoral program Agricultural Engineering with less than 250 full-time students by Latvia University of Life Sciences and Technologies.

The StP is offered in a full-time studies format of the period of 3 years in Latvian and in English in the amount of 120 Latvian study credit points or 180ECTS.

The main task of the StP to ensure a high-quality doctoral study process to prepare qualified scientists, lecturers and engineers who are competitive in the Latvian and European Union labor market and who could meet the current and promising needs of the Latvian and world economy using the latest technologies and solutions in agricultural engineering, product processing , energy supply and its rational use, as well as engineering issues in rural areas.

Admission conditions for persons who have Master's Degree in agriculture machinery, transport, energy, machine construction and related qualifications are entitled to participate in a competition (only in Latvian) for postgraduate studies in University TF, sub-field of agricultural engineering. Once admitted, the applicants who have obtained the Master's degree in other scientific discipline, may be asked to pass an entry exam in the chosen scientific field where indicated so by the program director of the relevant doctoral study program and department / institute. The main evaluation criterion of entry exam is the level of the applicant's knowledge in the main theoretical issues of the chosen specialty.

#### Conclusions by specifying the strengths and weaknesses

#### Conclusions:

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to promote the sustainable development of agricultural engineering field in both academic and professional context.

#### Strengths

1. Doctoral studies Ensure the continuity of academic and scientific personnel at the TF.

#### Weaknesses

None

## 2. The Content of Studies and Implementation Thereof

### Analysis

Analysing the submitted descriptions of study courses, it can be concluded that they have been developed qualitatively, they comply with the requirements of regulatory enactments, as it includes all the minimum requirements included in the Law on Higher Education Institutions. The content of the study courses is topical, which can be concluded from the approval dates shown in the descriptions of the study courses, which are not older than 2019.

Industry experts who evaluated the program in 2019 found the content of the program to be fully relevant to the needs of the industry and also covering all the necessary knowledge for the industry. For example, there is the topic Renewable energy resources for autonomous electricity supply in the study course "Agricultural Energetics", which is one of the most important topics nowadays.

In the mapping of the results of study courses, it is possible to trace the link between the results of the StP and the results of individual study courses. The results to be achieved in the StP are covered by the results of the study courses. Analyzing the descriptions of study courses, it can be concluded that student-centered education is implemented in the StP. The study implementation methods, including the evaluation methods, contribute to the achievement of the aims and learning outcomes of the study courses and the study programme. For example, there are draft article for the conference and development and presentation of the doctoral thesis part as part of the evaluation in the study course "Research Methodology in Engineering Sciences". Those are more relevant evaluation methods nether exam and contribute to the achievement of the aims of study programme.

The program management during the assessment visit and the written SER show that regular surveys of students and graduates are conducted by interviewing these two groups, there is no confidence in using the results of these surveys to improve the quality of studies.

According to the SER, extensive research of the opinions of employers and their representatives regarding the qualification of the graduates of the StP, as well as the content of the StP was carried out. 8.2.3.0/18/A/009 ". A number of improvements based on the results of this study are mentioned.

Thus, it can be concluded that the current survey of students and graduates is considered to be formal, which is not followed by further steps in improving the quality of studies.

The ERASMUS + KA1 program provides mobility opportunities for students in the StP, which is implemented through the University International Cooperation Center.

The list of study courses to be acquired during the mobility before going to the partner University is agreed with the director of the StP and upon return, based on the partner university documents issued, all courses taken are fully equated.

The SER does not contain data on incoming and outgoing mobility students during the reporting



period.

### **Conclusions by specifying the strengths and weaknesses**

In general, the content of study courses and its implementation can be assessed as good. It meets industry requirements and scientific trends.

Strengths:

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.

Weaknesses:

None

### **3. Resources and Provision of the Study Programme**

#### **Analysis**

The analysed StP represents a natural follow up to the corresponding MSc level StP. As such, it relies on resources the University has got available for maintaining the BSc and MSc level studying. As stated in the SER, the StP is realised within four member-institutions of the TF, namely Institute of Energetics, Institute of Agricultural Machinery, Mechanics Institute and Institute of Motor Vehicles. The expert team feels there are no reasons to believe the University is undercapacitated with respect to any of the resources needed to underpin academic processes encompassed by the given StP.

Overall analysis see in the Chapter 3 "Resources and Provision of the Study Field " of the Experts joint opinion.

### **Conclusions by specifying the strengths and weaknesses**

As said above, from both the SER and the feedback collected, there are no reasons to believe that the University is undercapacitated with respect to any of the resources needed to underpin academic processes having to do with the given StP.

Strengths:

1. Appropriate equipment for this StP.

Weaknesses:

None

### **4. Teaching Staff**

#### **Analysis**

The structure of teaching staff in terms of numbers is table with mostly University employed professors (just one visiting professor). In general, the number of involved teaching staff holding a Ph.D. also increased. Most teaching staff in this StP are internal. (85%) of the participants in the implementation of the program are the leading academic staff of the TF.

The academic staff members employed in the implementation of the StP carry research and

professional experience in the fields relevant for the study programme. Most teaching staff are active in publishing, but mostly through publishing in conference proceedings (although sometimes listed in Wos, Scopus...) and in one "local" scientific journal Agronomy research. Although teaching staff and researchers are very active at national and international conferences, the number of publications in recognised international scientific journals is extremely limited. The scientific work is therefore internationally less recognised and cited as expected from a doctoral study programme.

Most teaching staff is active in projects, but in general younger teachers that are involved in undergraduate and master study programmes Agricultural Engineering seem to be involved in more projects.

StP has its programme director, who is responsible for the quality and changes in the StP. Teaching staff have open communication between themselves and with StP director. Official communication on the StP also takes place on faculty Council.

### **Conclusions by specifying the strengths and weaknesses**

The qualification and research record of the teaching staff is in general on a satisfactory level. Although the scientific activity in terms of publishing could be increased and there is lack of projects from teaching staff.

Strengths:

1. good communication between teaching staff and StP director

Weaknesses:

1. scientific activity in terms of publishing is at a low level in terms of teaching staff from doctoral study programme
2. the number of projects of teaching staff is in general lower than in other study programmes.

## **5. Assessment of the Compliance of the Study Programme "Agricultural Engineering"**

### **Requirements**

1. The sample of the diploma to be issued for the acquisition of the study programme complies with the procedure by which state-recognised documents of higher education are issued.

**Assessment of compliance:** Fully compliant

The diploma sample (Annex "DR Diploma") provided fully complies with the procedure and regulations by which Latvian state-recognised documents of higher education are issued (MK Nr.202 "Kārtība, kādā izsniedz valsts atzītus augstāko izglītību apliecinošus dokumentus")

2. Documents 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.

**Assessment of compliance:** Fully compliant

Agreement in place with Riga Technical University.

3. 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.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21

- 4 4. The teaching staff members involved in the implementation of the study programme are proficient in the official language in accordance 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.

**Assessment of compliance:** Fully compliant

Confirmation of state language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 5 5. 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, if the study programme or any part thereof is to be implemented in a foreign language.

**Assessment of compliance:** Fully compliant

Confirmation on foreign language skills can be found in document No. 2.4.-6.2/21 and attached CVs.

- 6 6. At least five teaching staff members with a doctoral degree are among the academic staff of an academic doctoral study programme, at least three of which are experts approved by the Latvian Science Council in the respective field of science. At least five teaching staff members with a doctoral degree are among the academic staff of a professional doctoral study programme in arts.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21 and attached CVs. 7 members of staff are. with doctoral degree and all of them are experts approved by Latvian Science Council.

- 7 7. The academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in document No. 2.4.-6.2/21 and attached CVs. 4. At least five professors and associate professors elected to academic positions participate in the delivery of compulsory and restricted elective courses. Checked, the academic staff of the academic study programme complies with the requirements set forth in Section 55, Paragraph one, Clause 3 of the Law on Institutions of Higher Education.

- 8 8. The sample of the study agreement complies with the mandatory provisions to be included in the study agreement.

**Assessment of compliance:** Fully compliant

The study agreement sample provided fully complies with the regulation. (MK Nr.70 "Studiju līgumā obligāti ietveramie noteikumi")

- 9 9. The descriptions of the study courses and the study materials have been prepared in all languages in which the study programme is implemented, and they comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

The descriptions of the study courses and the study materials comply with the requirements set forth in Section 56.1, Paragraph two and Section 56.2, Paragraph two of the Law on Institutions

of Higher Education.

- 10 10. The study programme complies with the valid professional standard or the requirements for the professional qualification (if there is no professional standard required for the relevant occupation) provided that the completion of the study programme leads to a professional qualification.

**Assessment of compliance:** Not relevant

- 11 11. Academic study programmes provided for less than 250 full-time students may be implemented and less than five professors and associated professors of the higher education institution may be involved in the implementation of the mandatory and limited elective part of these study programmes provided that the relevant opinion of the Council for Higher Education has been received in accordance with Section 55, Paragraph two of the Law on Institutions of Higher Education.

**Assessment of compliance:** Fully compliant

Confirmation can be found in Council of Higher Education decision No. 1.10/79

- 12 12. The study programme complies with the State Academic Education Standard or the Professional Higher Education Standard.

**Assessment of compliance:** Not relevant

- 13 13. The joint study programmes comply with the requirements prescribed in Section 551, Paragraphs one, two, and seven of the Law on Institutions of Higher Education (if applicable).

**Assessment of compliance:** Not relevant

- 14 14. Each member of the academic staff has either publications published in reviewed editions within the last six years, including international editions (if they have worked for a shorter period of time, the number of publications shall be in proportion to the work period), or artistic creation achievements (for instance, exhibitions, films, theatre performances, and concert activity), or a five-year practical work experience (except for the experience in the implementation of the study programme) in accordance with the Law on Institutions of Higher Education.

**Assessment of compliance:** Partially compliant

Confirmation can be found in Annex "2 Part 6" - list of publications - and attached CVs that teaching staff has scientific publications, but mostly in one scientific journal and scientific conferences. We are missing more publications in high-ranked journals.

- 15 R5 - Overall rating

**Assessment of compliance:** Partially compliant

The study programme overall generally complies with the legal requirements set forth in the Law on Institutions of Higher Education and other regulatory enactments.

As soon as the identified shortcomings are remedied, the program receives a better evaluation.

## Requirements (R6-R8)

- 1 R6 - The compliance of the 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 ensuring the achievement of the learning outcomes.

**Assessment of compliance:** Fully compliant

The material and financial conditions for the study programme are adequate. TF has sufficient financial funds for development in terms of infrastructure and equipment. The students and teachers within study programme have good infrastructure in terms of classrooms, computers rooms, ICT support available etc. The same applies for library services. Financial support is sufficient to implement the study programme.

- 2 R7 - The compliance of the qualification of the academic staff members, visiting professors, visiting associate professors, visiting docents, visiting lecturers, and visiting assistants with the conditions for the implementation of the study programme and the provisions set out in the respective regulatory enactments.

**Assessment of compliance:** Partially compliant

The selection of teaching staff is suitable (based on accreditation data). Considering that this is an academic study programme teaching staff should have more scientific activity, publication, etc. experts missing more publications in high-ranked journals.

- 3 R8 - The study programme leading to the master or doctoral degree is based on the advances and findings in the relevant field of science or artistic creation.

**Assessment of compliance:** Fully compliant

The large number of publications of the teaching staff, which is related to the specifics of the study courses to be taught, testifies to the topicality of the study courses included in the program (2\_dala\_6\_pielikums\_macibsp\_publikacijas\_patenti.xlsx).

## **Conclusions by specifying the strengths and weaknesses**

The interrelation of the analyzed StP elements - name, degree, professional qualification, the aims, objectives, learning outcomes, and admission requirements - is strong, which is the result of the awareness of their importance (content-wise, legal-wise) to promote sustainable development of agricultural engineering field in both academic and professional context.

In general, the content of study courses and their implementation can be assessed as good. It meets industry requirements and scientific trends.

Strengths:

1. Current literature has been used in the study courses, the latest periodicals have been mentioned, which testify to the updating of the study courses.
2. The study courses are complementary, the acquired skills and competencies can be used in other study courses. The planning is logical and sequential.
3. Doctoral studies Ensure the continuity of academic and scientific personnel at the TF.
4. Good communication between teaching staff and StP director.

Weaknesses:

1. Scientific activity in terms of publishing is at a low level in terms of teaching staff from the doctoral study programme
2. The number of projects of teaching staff is in general lower than in other study programmes.

## **Evaluation of the study programme "Agricultural Engineering"**

Evaluation of the study programme:

Good

## 6. Recommendations for the Study Programme "Agricultural Engineering"

### Short-term recommendations

### Long-term recommendations

1. The teaching staff motivation system needs to be redesigned to encourage the production of higher quality publications and the involvement of teaching staff in projects.

## III. Assessment of the Requirements for the Study Field and the Relevant Study Programmes

### III. Assessment of the Requirements for the Study Field and the Relevant Study Programmes

#### Assessment of the Requirements for the Study Field

| Requirements  | Requirement Evaluation |  | Comment   |
|---|------------------------|--|---|
| R1 - Pursuant to Section 5, Paragraph 21 of the Law on Institutions of Higher Education, the higher education institution/ college shall ensure continuous improvement, development, and efficient performance of the study direction whilst implementing their internal quality assurance systems: | Fully compliant        |  | University ensures continuous improvement, development, and efficient performance of the study field whilst implementing their internal quality assurance systems. All necessary criteria established by the Section 5, Paragraph 21 of the Law on HEI have been met. However experts have identified some areas for further improvement. For instance lack of efficiency in the e-learning system to get feedback from students. |

| Requirements   | Requirement Evaluation | Comment  |
|--|------------------------|--|
| R2 - The cooperation with different organisations from Latvia and abroad implemented within the study direction ensures the achievement of the aims of the study direction.                              | Partially compliant    | The University maintains very good relationship with the industry through its staff members. Such relationships generate positive outputs both in helping students finding their traineeship opportunities as well as in starting their professional careers. However, the University maintains an operating practice which undermines the importance of contractual formalisation of cooperation with the industry. By doing so the University stimulates a liability-free undertaking allowing its employees and partners to even take advantage of established informal cooperations and secure personal gains without significantly benefiting the institution itself. |
| R3 - Compliance of scientific research and artistic creation with the development level thereof (if applicable).   | Fully compliant        | Scientific research is in line with the state of the art and is constantly evolving.   |
| R4 - Elimination of the shortcomings and deficiencies identified during the previous assessment of the study direction, if it has been conducted, or the implementation of the provided recommendations. | Fully compliant        | Elimination of the shortcomings and deficiencies identified during the previous assessment of the study field has been realised. There are still some improvement and continuous action required.  |

#### Assessment of the Requirements for the Relevant Study Programmes of the Study Field

| No. | Study programme | R5 | R6 | R7 | R8 | Evaluation of the study programme (excellent, good, average, poor) |
|-----|-----------------|----|----|----|----|--|
|-----|-----------------|----|----|----|----|--|

| <b>No.</b> | <b>Study programme</b>                        | <b>R5</b>           | <b>R6</b>       | <b>R7</b>           | <b>R8</b>       | <b>Evaluation of the study programme (excellent, good, average, poor)</b> |
|------------|---|---------------------|-----------------|---------------------|-----------------|---|
| 1          | Machine Design and Manufacturing (42521)      | Partially compliant | Fully compliant | Fully compliant     | Not relevant    | Good  |
| 2          | Biosystems machinery and technologies (43525) | Fully compliant     | Fully compliant | Fully compliant     | Not relevant    | Good  |
| 3          | Agricultural Engineering (43525)              | Fully compliant     | Fully compliant | Partially compliant | Not relevant    | Good  |
| 4          | Agricultural Engineering (45525)              | Fully compliant     | Fully compliant | Fully compliant     | Fully compliant | Good  |
| 5          | Agricultural Engineering (51525)              | Partially compliant | Fully compliant | Partially compliant | Fully compliant | Good  |

### **The Dissenting Opinions of the Experts**

There are no differences of opinion between experts.